Final Environmental Assessment

for

A Greater Sage-Grouse Umbrella Candidate Conservation Agreement with Assurances for Wyoming Ranch Management

Prepared by

U.S. Fish and Wildlife Service

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1. INTRODUCTION

Greater sage-grouse (*Centrocercus urophasianus*; hereafter referred to as sage-grouse) are native game birds closely tied to landscapes dominated by sagebrush (*Artemisia spp.*) in the western United States (U.S.) and Canada. The species originally occurred in 13 states (Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming) and 3 Canadian provinces (Alberta, British Columbia, and Saskatchewan), but have been extirpated from Arizona, Nebraska, and British Columbia (Schroeder et al. 2004). Sage-grouse range contraction is due primarily to alteration or elimination of sagebrush (Aldridge et al. 2008). Rangewide, sage-grouse currently occupy approximately 56 percent of their pre-European distribution (Schroeder et al. 2004), and overall abundance has decreased by as much as 93 percent from presumed historical levels (Braun 2006).

On March 23, 2010 (75 FR 13910), the U.S. Fish and Wildlife Service (FWS) determined that listing the sage-grouse under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) was warranted, but precluded by higher priorities. Based on this decision, the sage-grouse is now a Federal candidate species and its status will be reviewed annually by the FWS. In an effort to conserve sage-grouse and avoid listing, States within the current sage-grouse range have taken steps to reduce impacts to the species and maintain its habitat, including development of a Candidate Conservation Agreement with Assurances (CCAA) titled *Greater Sage-Grouse Umbrella CCAA for Wyoming Ranch Management*.

Under a CCAA, property owners voluntarily commit to implementing specific conservation measures on non-Federal lands for species covered by the CCAA. In exchange, they receive assurances from the FWS that, if the species is listed in the future, additional conservation measures will not be required, and additional land, water, or resource use restrictions under the ESA will not be imposed on them, provided the CCAA is being properly implemented. These assurances serve as an incentive for participation in a CCAA because they provide considerable certainty to participating property owners regarding their activities on non-Federal lands covered by the CCAA. Sections 2, 7, and 10 of the ESA allow the FWS to enter into a CCAA. Section 2 of the ESA encourages interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs key to safeguarding the Nation's heritage in fish, wildlife, and plants. Section 7 of the ESA requires the FWS to review programs that we administer and to utilize such programs in furtherance of the purposes of the ESA. Lastly, section 10(a)(1)(A) of the ESA authorizes the issuance of enhancement of survival permits for a species through participation in a CCAA. Policy (64 FR 32726; June 17, 1999) and regulations (69 FR 24084; May 3, 2004) provide specific direction on implementation of the CCAA program.

The Wyoming Governor's Office (WGO) requested assistance from the FWS in developing a sage-grouse strategy for ranch management activities that would offer landowners assurances their livestock operations could continue without additional restrictions, in the event the species were listed. As a result, several offices and agencies including: FWS, WGO, Wyoming Bureau of Land Management (BLM), Natural Resources Conservation Service (NRCS), Wyoming Game and Fish Department (WGFD), Wyoming Department of Agriculture (WDA), Wyoming Association of Conservation Districts (WACD), and the U.S. Forest Service (USFS) have developed a draft umbrella CCAA to better manage and

conserve sage-grouse in Wyoming. Conservation measures have been identified in the draft umbrella CCAA to address impacts to the species that may occur as a result of ranching practices.

In the sage-grouse 12-month finding (75 FR 13910; March 23, 2010), the FWS identified habitat fragmentation as the primary threat to the species. Energy development and associated infrastructure, invasive species and associated changes in fire cycles, and conversion of habitat for crop production are the three main factors contributing to fragmentation. Several other factors contributing to habitat fragmentation are also identified, including livestock management. However, while some livestock management methods may be detrimental to sage-grouse habitat, it was not a primary contributor to the warranted determination. The FWS determined that the act of grazing was not the actual threat, rather it was some aspects of livestock management and the potential influence it may have on habitat loss, fragmentation, and degradation.

This EA was prepared in accordance with the National Environmental Policy Act (NEPA; 42, U.S.C. §4321 et. seq.) and in compliance with all applicable regulations and laws passed subsequently, including Council on Environmental Quality regulations (40 CFR, Parts 1500-1508) and U.S. Department of Interior requirements (43 CFR Part 46). NEPA compliance is required for the umbrella CCAA because issuance of an ESA section 10 permit by the FWS is a Federal action. The area potentially impacted by any of these alternatives would include non-Federal lands containing potential sage-grouse habitat throughout Wyoming. Figure 1 depicts potential sage-grouse habitat on private and public lands in Wyoming.

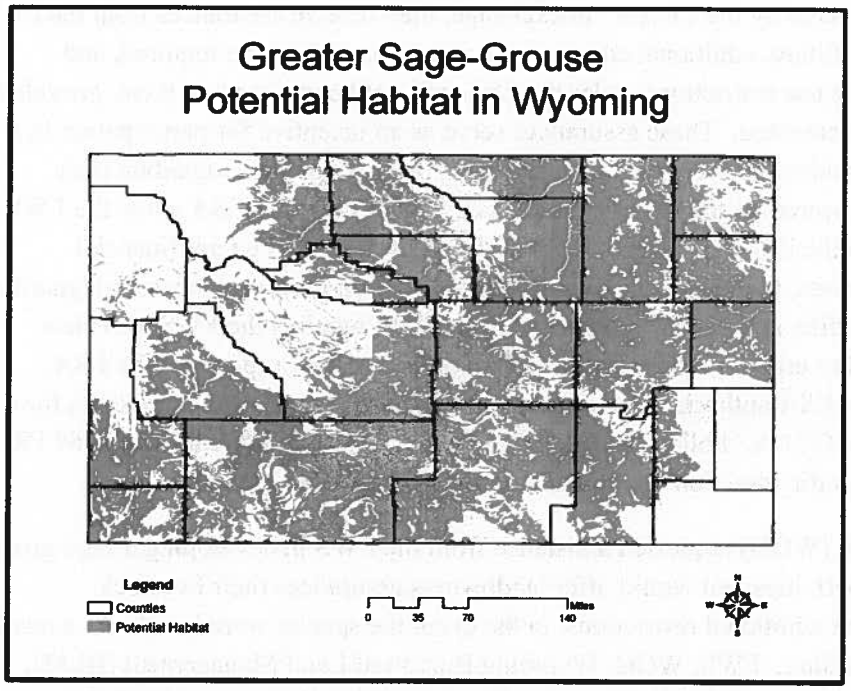

Figure 1. Potential greater sage-grouse habitat within Wyoming

Our evaluation will consider:

- The collective impacts of the FWS providing assurances and issuing multiple individual ESA section 10(a)(1)(A) enhancement of survival permits to non-Federal landowners participating in the umbrella CCAA; and
- The collective impacts of individual landowners implementing conservation measures on non-Federal lands from the umbrella CCAA.

1.1 Purpose and Need for Action

The purpose of the umbrella CCAA is to implement conservation measures that would contribute to the improvement and long-term survival of the sage-grouse and, if the conservation measures were also to be implemented on other necessary properties, to preclude or remove the need to list this species under the ESA.

The need for the action is to encourage non-Federal landowners in Wyoming to voluntarily enroll in the CCAA to improve conservation of the sage-grouse by providing them regulatory certainty regarding the species. The regulatory certainty, under the authority of Section 10(a)(1)(A) of the ESA, entails a permit that would authorize incidental take of the sage-grouse associated with implementation of the CCAA should the species be listed. Issuance of the permit also conveys the Service's assurance that no additional conservation measures or land, water, or resource use restrictions beyond those voluntarily agreed to by the non-Federal landowner will be required for the species, should it be listed in the future. To further encourage participation, the CCAA will facilitate habitat management efforts by providing a streamlined process for selecting appropriate conservation measures and best management practices for each participating landowner.

1.2 Approval to be Made by the Responsible Official

The FWS, as the responsible official, will determine whether or not to approve the umbrella CCAA and issue enhancement of survival permits, in accordance with section 10 of the ESA. To make this determination, FWS must find that:

- Any take of sage-grouse due to ranching activities will be incidental to otherwise lawful activities and in accordance with terms of the umbrella CCAA;
- The umbrella CCAA complies with the requirements of the Candidate Conservation Agreement with Assurances final policy (64 FR 32726; June 17, 1999);

- The probable direct and indirect effects of any authorized take will not appreciably reduce the likelihood of survival and recovery in the wild of any species;
- Implementation of the terms of the umbrella CCAA are consistent with applicable Federal, State, and tribal laws and regulations;
- Implementation of the terms of the umbrella CCAA will not be in conflict with any ongoing conservation programs for species covered by the CCAA; and
- The signatories have shown capability for and commitment to implementing all of the terms of the umbrella CCAA.

1.3 Scoping

The umbrella CCAA was developed cooperatively by the WGO, WDA, WGFD, WACD, BLM, NRCS, USFS and FWS. Beginning in January 2011, the CCAA Committee created and published six monthly issues of the *Greater Sage-Grouse Candidate Conservation Agreement with Assurances for Ranch Management* informational flier. The flier was distributed statewide to governmental agency staff, landowners, and grazing permittees. Additionally, landowners throughout Wyoming have attended planning meetings during development of the umbrella CCAA.

2. DESCRIPTION OF ALTERNATIVES

We are evaluating three alternatives in this EA: (1) a No Action Alternative, (2) a Landowner by Landowner Alternative, and (3) the Proposed Action Alternative.

2.1 No Action Alternative

Under the No Action Alternative, the status quo regarding management of sage-grouse on non-Federal lands would continue in Wyoming. The FWS would not enter into an umbrella CCAA with landowners, and no associated individual CCAAs or incidental take would be authorized. Very few CCAAs for sage-grouse would be completed in a timely manner due to limited staffing and other workload priorities. While private landowners would likely continue within other programs to implement conservation on the ground to conserve the sage-grouse (e.g., Farm Bill Programs such as WHIP, EQIP and others, as well as the NRCS Sage Grouse Initiative), it is unlikely that the full suite of conservation measures that could be implemented within the context of the CCAA would be implemented. Existing protections for the species would remain in effect and are described in the following paragraphs.

The WGO Executive Order (EO) 2011-5 would remain in effect in Wyoming until at least August, 2015. This EO mandates special management of sage-grouse and their habitat in designated "Core Population Areas." Core Population Areas cover approximately 23 percent of the State and include approximately 80 percent of all sage-grouse in the State. Existing land uses (activities existing prior to August 1, 2008) within Core Population Areas would be allowed to continue. Examples of existing activities include oil and gas, mining, agriculture, processing facilities, housing, and other uses. However, new development or land uses within Core Population Areas that require State review or approval would be authorized or conducted only when it could be demonstrated that they would not cause declines in Wyoming sage-grouse populations.

Eight local Sage-Grouse Working Groups (SGWG) that have been established in Wyoming to develop and implement strategies for maintaining and improving sagebrush habitat for sage-grouse and other species would remain active. The SGWG are comprised of members representing local interests from agriculture, conservation, industry, the general public, Federal, State, and local governments. Each group has developed a local Sage-grouse Conservation Plan and has provided funding for projects ranging from habitat enhancement to researching the effects of wind energy development on the species.

The sage-grouse is not considered a migratory species; therefore, it is not covered by the provisions of the Migratory Bird Treaty Act (16 U.S.C. 703-712). However, several Federal agencies have other legal authorities and requirements for managing the species and its habitat. These Federal authorities would continue to be implemented and are described in the following paragraphs.

The NRCS Sage Grouse Initiative, begun in March, 2010, to conserve sage-grouse and sustain working ranches throughout the range of the species (including Wyoming), would continue. This initiative provides funding through existing conservation programs such as the Environmental Quality Incentives Program and the Wildlife Habitat Incentive Program.

The BLM manages the majority of sage-grouse habitat across the species' range (Stiver et al. 2006). The agency would continue to incorporate habitat conservation measures for sage-grouse into Resource Management Plans developed for lands it manages throughout the current range of the species. Instruction Memorandum No. WY-2012-019 provides guidance to BLM Wyoming Field Offices regarding management of sage-grouse habitats until RPM updates are completed. The BLM has also pledged to honor management stipulations for development in Core Population Areas designated under EO 2011-5.

The USFS also manages sage-grouse habitat on its lands across the species' range. The agency has designated the sage-grouse as a sensitive species on USFS lands rangewide (including Wyoming). Sensitive species require special consideration during land use planning and activity implementation. This consideration would continue.

2.2 Landowner by Landowner Alternative

Under the Landowner by Landowner Alternative, all existing protections described under the No Action Alternative would continue. An umbrella CCAA would not be utilized to streamline the process for landowner enrollment. Instead, individual CCAAs could be completed and approved, and enhancement of survival permits issued, all on a case by case basis, to each landowner interested in conserving sage-grouse. An enrolled landowner could receive ESA regulatory assurances from the FWS as under the Proposed Action Alternative. However, crafting individual CCAAs without the guidance provided in an umbrella CCAA would be more expensive and time consuming for the landowners, which would decrease the likelihood that landowners would choose to participate. No mechanism for maintaining statewide consistency between individual CCAAs exists under this alternative, and it would require a specific effort to develop one. Timely authorization by the FWS of individual CCAAs for sage-grouse could be impeded due to restrictive staffing and other workload priorities.

2.3 Proposed Action Alternative

The Proposed Action Alternative is the preferred alternative. Under this alternative, all existing protections described under the No Action Alternative would continue. Additionally, non-Federal landowners would be able to voluntarily complete individual CCAAs using the umbrella CCAA to streamline the process. Streamlining would be achieved by: (1) following the template provided in the umbrella CCAA to guide the application process, including selection of site-specific conservation measures; (2) FWS and other participating agencies providing assistance to landowners in drafting individual CCAAs, implementing selected conservation measures, and conducting biological monitoring; (3) prioritizing applications; and (4) batching approval of individual CCAAs and permit applications based on their time of submission.

The umbrella CCAA would be in effect for 40 years following its approval and signing by the FWS. Individual CCAAs for enrolled landowners, including any commitments related to funding under FWS programs, would be in effect for 20 years following approval and signing by the FWS. The section 10(a)(1)(A) permit authorizing take of the species would also have a term of 20 years from the effective date of the permit. While the species remains unlisted, the FWS may renew individual CCAAs and permits, based upon reevaluation of the CCAA's ability to continue to meet the CCAA standard. An enrolled landowner may also voluntarily terminate an individual CCAA.

Individual CCAAs would be developed under the guiding framework of the umbrella CCAA. By signing an individual CCAA and permit application, the landowner would agree to implement selected conservation measures associated with current or future activities on the enrolled land. These measures are designed to reduce or remove threats to the sage-grouse and restore, enhance, or preserve its habitat. The landowner would also agree to allow access to monitor the effectiveness of the implemented measures. In return, the FWS would agree not to impose further commitments of resources or additional restrictions on the enrolled landowner during the term of the permit, if the species is listed. The enrolled

landowner would receive an enhancement of survival permit which would provide incidental take coverage for those activities covered by the individual CCAA, should the sage-grouse be listed. This approach is consistent with the Candidate Conservation Agreement with Assurances Final Policy (64 FR 32726; June 17, 1999) and the regulations implementing the policy (69 FR 24084; May 3, 2004).

Regulatory incentives and streamlining processes under the Proposed Action Alternative are expected to maximize the number of participating landowners. Implementation of this alternative is fully described in the umbrella CCAA. The conservation measures that could be selected by participating landowners to reduce or eliminate potential threats to the species caused by ranching activities are also presented in the umbrella CCAA.

To ensure that the individual CCAA is working and the conservation measures are adequate, the enrolled landowner must undertake or allow the following measures to continue:

- Avoid impacts to sage-grouse present on enrolled properties to the greatest extent possible.
- Continue practices that have been identified as beneficial to sage-grouse conservation.
- Implement all conservation measures agreed upon in the individual CCAA.
- Be willing to provide the FWS or their representatives access to the enrolled property at mutually acceptable times to identify or monitor sage-grouse and their habitat, document habitat conditions, implement conservation measures, and monitor effectiveness and compliance with the individual CCAA. All monitoring information would be available to the public.
- When requested, allow participating agencies to share habitat and other planning or monitoring information related to the enrolled properties.
- Cooperate and assist with monitoring activities and other reporting requirements.

Each individual CCAA will include the following conservation measure in addition to those selected to address site-specific threats. This required measure is the foundation in each CCAA for preventing or reducing habitat fragmentation, the primary threat to sage-grouse.

Maintain contiguous habitat by avoiding fragmentation (e.g., do not subdivide property, consider conservation easements).

Other threats within control of the enrolled landowner that have been identified on a property must also be addressed through the selection of one or more appropriate conservation measures listed in the umbrella CCAA. The process for identifying threats and corresponding conservation measures includes non-Federal landowners working with the FWS and other participating agencies on identified properties, recognizing that each property is unique and site-dependent. The following are potential threats to sage-grouse due to ranch management. The extent to which some of these threats are under complete control of the landowner may vary:

- **Habitat fragmentation (e.g., sub-dividing for housing; roads),**
- **Infrastructure (e.g., powerlines, roads) that decreases habitat quality,**
- **Disturbed, degraded, or fragmented habitat that is not restored or reclaimed,**
- **Establishment of non-native monocultures,**
- **Invasive and non-native plant species,**
- **Surface water developments that increase frequency of disease,**
- **Sagebrush management (prescribed fire, chemical, or mechanical),**
- **Poor grazing management practices,**
- **Livestock concentration,**
- **Woodland encroachment,**
- **Livestock, vehicle, and human activities that physically disturb sage-grouse,**
- **Design and placement of water developments (including ponds and springs),**
- **Predation,**
- **Insecticide use,**
- **Prolonged drought,**
- **Watering tanks and troughs that can cause entrapment and drowning, and**
- **Placement of fences.**

While the conservation measures in the umbrella CCAA should apply across any lands to be enrolled in individual CCAAs, there may be circumstances where site-specific modifications or conditions warrant changes to the standard prescriptions. Changes to conservation measures will occur in consultation with local agency specialists (e.g., biologists, range management specialist) and will be noted by the FWS on individual agreements, including rationale or justification for any modifications. If such changes may result in impacts to the human environment that were not analyzed in this EA, the FWS would determine what additional NEPA action may be necessary.

3. AFFECTED ENVIRONMENT

This section describes in general terms the resources that could be affected if the FWS approves the umbrella CCAA.

3.1 Project Area

The Project Area would encompass all existing, potential, and historical sage-grouse habitat on non-Federal lands throughout Wyoming.

3.2 Sagebrush Habitat

This section summarizes the vegetation and wildlife found in the Project Area, including special status species.

3.2.1 Sage-grouse

Information in this section is primarily based on Connelly et al. (2004) and the conservation plans developed by the eight SGWG in Wyoming (Bates Hole/Shirley Basin SGWG 2007; Big Horn Basin SGWG 2007; Northeast Wyoming SGWG 2006; South Central SGWG 2007; Southwest Wyoming SGWG 2007; Upper Green River Basin SGWG 2007; Upper Snake River Basin SGWG 2008; and Wind River/Sweetwater River SGWG 2007). These documents are incorporated by reference.

Sagebrush habitats are essential for sage-grouse survival. Suitable sage-grouse habitat consists of plant communities dominated by sagebrush and a diverse native grass and forb (flowering herbaceous plants) understory. Habitat requirements during late brood-rearing (mid-July through September) may also include riparian sites. The composition of shrubs, grasses, and forbs varies with the season, the subspecies of sagebrush, the condition of the habitat at any given location, soil type, moisture regime, and range site potential.

Sage-grouse habitat is relatively intact in Wyoming compared to other states within the species' range. An estimated 67 percent of potential sagebrush habitat in Wyoming remains in sagebrush (Connelly et al. 2004). However, the quality of sagebrush habitat has often declined. As previously mentioned, current threats to the species' habitat in Wyoming include: fragmentation; infrastructure that decreases habitat quality; disturbed or degraded habitat that is not restored or reclaimed; non-native monocultures; invasive and non-native plant species; wildfire; surface water developments that increase disease frequency;

sagebrush management (prescribed fire, chemical, or mechanical); poorly managed grazing practices; livestock concentration; woodland encroachment; livestock, vehicle, and human activity that physically disturbs sage-grouse; design and placement of water developments; predation; insecticide use; prolonged drought; watering tanks and troughs that can cause entrapment and drowning; concentrated or over-abundant wildlife populations; and fences.

Sage-grouse use habitat according to their seasonal needs. Seasonal habitats include breeding habitat (leks) in early spring, nesting habitat in late spring, early brood-rearing habitat from June to mid-July, late brood-rearing habitat from mid-July through September, fall habitat from mid-September to first major snow, and winter habitat. Each of these habitats is described briefly below. A more complete description of local habitat can be found in the SGWG conservation plans referenced above.

3.2.1.1 Breeding Habitat (Leks) in Early Spring

Leks are generally situated on sites with minimal sagebrush, broad ridge-tops, grassy openings, and have often undergone disturbance. Sage-grouse select areas as lek sites that have lower plant heights and less shrub cover than surrounding areas.

3.2.1.2 Nesting Habitat in Late Spring

Sage-grouse typically nest under mid-height, moderate density sagebrush up to 32 inches (in) (81 centimeters (cm)) in height, but may use other large shrubs. Sagebrush canopy cover at nesting sites averages about 23 percent. Hens select areas of greater total shrub and dead sagebrush canopy cover for nests, with good residual grass (standing dead grass remaining from the previous year) under the sagebrush canopy. The areas between the sagebrush plants typically have good forb cover and maintain some grass and litter cover.

Plant composition in early spring habitat contributes to nesting success. At green-up, forbs are more nutritious than sagebrush. Hens need foods rich in protein, calcium, and phosphorus to support nest initiation, increase clutch size, improve hatch success, and increase early chick survival. Low growing leafy forbs, especially milky-stemmed composites (e.g., dandelion), represent potential food forbs. However, sage-grouse will eat most young and succulent forb species.

Approximately two-thirds of hens nest within 3 miles (mi) (5 kilometers (km)) of the lek where they were bred. The remaining third usually nest within 15 mi (24 km) of the lek.

3.2.1.3 Early Brood-Rearing Habitat from June to Mid-July

Early brood-rearing habitats are used during the brood's first month of life. Hens move their brood immediately upon hatching from the nest site to brood-rearing areas. Sites used during the first 10-14 days after hatching are typically within 1.5 mi (2.4 km) of the nest. The vast majority of chick mortality occurs during this period. After the first 10 days, broods may have dispersed 5 mi (8 km) or more from the nest.

A highly diverse vegetation mosaic is essential to early brood-rearing. Early brood-rearing habitat is more open (10-15 percent sagebrush canopy cover) with higher herbaceous cover than typically found in nesting habitat. Brood survival is tied to an abundance of insects and green vegetation, primarily forbs, in close proximity to denser patches of sagebrush that provide protection from weather and predators. Vegetation diversity increases insect diversity. Insects are crucial during the first ten days of a chick's life.

3.2.1.4 Late Brood-Rearing Habitat from Mid-July to Mid-September

As summer progresses and food plants mature and dry, sage-grouse move to areas still supporting succulent herbaceous vegetation. These areas may be lower elevation native or irrigated meadows. Sage-grouse will also migrate to higher elevations, seeking habitats where succulent forbs are still available in sagebrush habitats or sites such as moist grassy areas or upland meadows. In more arid areas, wetland and riparian areas become important to late summer brood survival. From mid to late summer, wetlands and riparian habitat along springs and streams are the primary sites that produce the forbs and insects necessary for juvenile birds. Sage-grouse continue to rely on adjacent sagebrush for protection from weather and predators, and for roosting and loafing.

3.2.1.5 Fall Habitat from Mid-September to First Major Snow

Sage-grouse normally move from late brood-rearing habitat to transitional fall habitat before moving onto winter range. As precipitation increases and temperatures decrease, sage-grouse move into mixed sagebrush-grassland habitats in moist upland and mid-slope draws where fall green-up of cool-season grasses and some forbs may occur.

3.2.1.6 Winter Habitat

Sage-grouse move onto winter range with the first major snowfall accumulation. Movements to wintering areas vary widely, ranging from a few miles or kilometers to over 50 mi (80 km). Sage-grouse feed almost exclusively on sagebrush leaves and buds during winter. Suitable winter habitat requires sagebrush above snow.

Sage-grouse roost in open sagebrush sites on clear, calm nights. However, during windy periods or snowstorms, sage-grouse seek taller shrubs with greater canopy cover. The species tends to select wintering sites where sagebrush extends at least 10-14 in (25-36 cm) above the snow. Sage-grouse will also burrow into deep powdery snow to conserve energy. Under severe winter conditions, sage-grouse will often be restricted to tall stands of sagebrush located on deeper soils in or near drainage basins. During severe winters, the amount of available winter habitat is greatly reduced in much of Wyoming.

3.2.2 Other Wildlife

Although the focus of the umbrella CCAA is the sage-grouse, numerous other wildlife species also inhabit sagebrush ecosystems in Wyoming and could be affected if the umbrella CCAA is approved and implemented. These other species are discussed in this section.

The mix of shrubs and herbaceous plants found in sagebrush and associated communities in Wyoming provides habitat for approximately 87 species of mammals, 297 species of birds, and 63 species of fish, reptiles, and amphibians (Wyoming Interagency Vegetation Committee 2002). Mule deer (*Odocoileus hemionus*) and pronghorn (*Antilocapra americana*) are the primary big game species that utilize sagebrush habitat. Grazing and browsing by mule deer and pronghorn can contribute to long-term changes in plant communities that may be positive or negative for sage-grouse (Northeast Wyoming Sage-grouse Working Group 2006). Sagebrush obligate species, in addition to sage-grouse, include: pronghorn, sage sparrow (*Amphispiza belli*), Brewer's sparrow (*Spizella breweri*), sage thrasher (*Oreoscoptes montanus*), sagebrush vole (*Lemmiscus curtatus*), and sagebrush lizard (*Sceloporun graciosus graciosus*).

The WGFD has identified 15 bird and mammal species of greatest conservation need that depend on sagebrush communities during part or all of their lives (Table 1), including several of the sagebrush obligates mentioned above. Species of greatest conservation need are species with low or declining populations that are indicative of the diversity and health of the State's wildlife. Three of the 15 sagebrush-dependent species have a Native Species Status of 2 (see definitions following Table 1), including the sage-grouse.

Table 1. Sagebrush ecosystems species of greatest conservation need in Wyoming

Common Name	Scientific Name	Native Species Status*
Brewer's sparrow	*Spizella breweri*	NSS4
greater sage-grouse	*Centrocercus urophasianus*	NSS2
sage sparrow	*Amphispiza belli*	NSS4
sage thrasher	*Oreoscoptes montanus*	NSS4
eastern red bat	*Lasiurus borealis*	NSS4
Great Basin pocket mouse	*Perognathus parvus*	NSS3
Idaho pocket gopher	*Thomomys idahoensis*	NSS3
olive-backed pocket mouse	*Perognathus fasciatus*	NSS3
pallid bat	*Antrozous pallidus*	NSS2
Plains pocket gopher	*Geomys bursarius*	NSS4

pygmy rabbit	*Brachylagus idahoensis*	NSS3
sagebrush vole	*Lemmiscus curtatus*	NSS4
spotted bat	*Euderma maculatum*	NSS2
spotted ground squirrel	*Spermophilus spilosoma*	NSS3
white-tailed prairie dog	*Cynomys leucurus*	NSS4

Source: WGFD 2005

* NSS2 – Populations declining, extirpation possible; habitat restricted or vulnerable but no recent or ongoing significant loss; species likely sensitive to human disturbance. -OR- Populations declining or restricted in numbers or distribution, extirpation not imminent; ongoing significant loss of habitat.

* NSS3 – Populations greatly restricted or declining, extirpation possible; habitat not restricted, vulnerable but no loss; species not sensitive to human disturbance. -OR- Populations declining or restricted in numbers or distribution, extirpation not imminent; habitat restricted or vulnerable but no recent or ongoing significant loss; species likely sensitive to human disturbance. -OR- Species widely distributed; population status or trends unknown but suspected to be stable; on-going significant loss of habitat.

*NSS4 – Populations greatly restricted or declining, extirpation possible; habitat stable and not restricted. -OR- Populations declining or restricted in numbers or distribution, extirpation not imminent; habitat not restricted, vulnerable but no loss; species not sensitive to human disturbance. -OR- Species widely distributed, population status or trends unknown but suspected to be stable; habitat restricted or vulnerable but no recent or on-going significant loss; species likely sensitive to human disturbance. -OR- Populations stable or increasing and not restricted in numbers or distribution; on-going significant loss of habitat.

3.2.3 Threatened and Endangered Species

In Wyoming, seven animal species and four plant species are listed as threatened or endangered under the ESA. Threatened animal species include: Canada lynx (*Lynx canadensis*), grizzly bear (*Ursus arctos horribilis*), and Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Endangered animal species include: black-footed ferret (*Mustela nigripes*), Kendall warm springs dace (*Rhinichtys osculus thermalis*), whooping crane (*Grus americana*), and Wyoming toad (*Bufo baxteri*). The black-footed ferret is present in Wyoming in a non-essential experimental population. The gray wolf (*Canis lupus*) was recently delisted in Wyoming.

The four listed plant species in Wyoming include: the endangered blowout penstemon (*Penstemon haydenii*), and the threatened Colorado butterfly plant (*Gaura neomexicana* var. *coloradensis*), Ute ladies'-tresses (*Spiranthes diluvialis*), and desert yellowhead (*Yermo xanthocephalus*). In addition to sage-grouse, there are four other candidate species in Wyoming including: North American wolverine (*Gulo gulo luscus*), yellow-billed cuckoo (*Coccyzus americanus*), Fremont County rockcress (*Boechera pusilla*), and whitebark pine (*Pinus albicaulis*).

None of the listed or candidate species in Wyoming, other than sage-grouse, are a sagebrush obligate species. However, some of the listed species may be found incidentally in or near sagebrush habitats. Historically, the black-footed ferret was found throughout much of Wyoming, wherever prairie dogs occurred, including most of the sagebrush habitat in the State. Currently in Wyoming, black-footed ferrets only occur in one reintroduced population in Shirley Basin. The Shirley Basin includes sagebrush habitats and sage-grouse. Historically, grizzly bears and gray wolves were wide-ranging in Wyoming, including sagebrush habitats, but are now limited to mountainous areas of northwest Wyoming. It is possible these species occasionally use sagebrush habitats within their current range. Sagebrush is present in the area surrounding the warm springs where the Kendall warm springs dace occurs. Ute ladies'-tresses, Preble's meadow jumping mice, and yellow-billed cuckoo are tied to wetland or riparian areas; however, surrounding habitat can include sagebrush. Similarly, the cushion plant habitat where desert yellowhead occurs, the sand dune habitat where blowout penstemon occurs, and the granite outcrops where Fremont County rockcress occurs are located adjacent to sagebrush habitats.

3.3 Water Resources

This section summarizes the water resources found in the Project Area. Three major U.S. rivers have their headwaters in Wyoming, including the Missouri River on the east side of the Continental Divide and the Colorado River and Columbia River on the west side of the Divide. The Missouri River Basin drains 71.8 percent of Wyoming's land area, the Colorado River Basin drains 21.4 percent, and the Columbia River Basin drains 5.3 percent (Jordan and DeBoer 1996).

Fourteen river basins occur in Wyoming. Ten are part of the Missouri River Basin, two are part of the Colorado River Basin, one is part of the Columbia River Basin, and one is part of the Great Basin. Two of Wyoming's river basins do not have substantial amounts of sagebrush habitat: the South Platte River Basin, which occurs on the high plains of southeast Wyoming in grassland habitat; and the Yellowstone River Basin, which occurs entirely in the Teton Wilderness Area and Yellowstone National Park in northwest Wyoming, primarily in forested habitat.

3.3.1 Water Quality

The Wyoming Department of Environmental Quality Water Quality Division (WDEQ WQD), the primary agency responsible for enforcing Federal and State water quality regulations, summarizes water quality conditions by river basin. In 2012, the WDEQ WQD prepared its most recent summary of water quality conditions in the state (WDEQ WQD 2012). The primary causes of water quality impairment are fecal coliform and selenium in Wyoming streams, and sedimentation and selenium in Wyoming lakes and reservoirs (Table 2).

Table 2. Causes of water quality impairment for streams in Wyoming

Cause of Impairment	Stream Miles
Fecal Coliform	950
Selenium	358
Sediment	270
Habitat Modification	176
Arsenic	120
Chloride	99
Temperature	89
Manganese	64
Oil and Grease	47
Flow Alterations	46
Ammonia	17
Copper	17
Cadmium	12
Silver	12
pH	10

Source: WDEQ WQD 2012

Sources of impairment are unknown for forty-four percent of Wyoming streams. Eighteen percent are impaired by natural sources, with several sources of impairment contributing to the remaining thirty-eight percent. These sources are summarized in Table 3.

Table3. Sources of water quality impairment for streams in Wyoming

Source of Impairment	Stream Miles
Unknown	1156
Natural Sources	477
Livestock Grazing	389
Wildlife Grazing	18
Irrigated Crop Production	306

Petroleum Production	170
Municipal Stormwater	45
Habitat Modification	54
Hardrock Mining	17
Municipal WWTPs	10
Hardrock Mining in MT	7

Source: WDEQ WQD 2012

The WDEQ WQD tracks waters in the State that are designated as either impaired or threatened, and under Section 303(d) of the Clean Water Act, requires a Total Maximum Daily Load (TMDL) study for any waters so designated. The waters requiring a TMDL are reported by river basin (Table 4 – continued on page 21). The Big Horn River Basin, Powder River Basin, and Tongue River Basin have the most waters requiring TMDLs and all have substantial amounts of sage-grouse habitat.

Table 4. Wyoming River Basins with Substantial Sagebrush Habitat and Number of Waters Requiring TMDLs

Wyoming River Basin (major river basin)	Substantial Sagebrush Habitat?	Number of Waters Requiring TMDLs
Bear River Basin (Great Basin)	Yes	2
Belle Fourche River Basin (Missouri River Basin)	Yes	9
Big Horn River Basin (Missouri River Basin)	Yes	28
Cheyenne River Basin (Missouri River Basin)	Yes	-
Green River Basin (Colorado River Basin)	Yes	10
Little Missouri River Basin (Missouri River Basin)	Yes	-

Table 4. Wyoming River Basins with Substantial Sagebrush Habitat and Number of Waters Requiring TMDLs

Wyoming River Basin (major river basin)	Substantial Sagebrush Habitat?	Number of Waters Requiring TMDLs
Little Snake River Basin (Colorado River Basin)	Yes	13
Niobrara River Basin (Missouri River Basin)	Yes	-
North Platte River Basin (Missouri River Basin)	Yes	16
Powder River Basin (Missouri River Basin)	Yes	19
Snake River Basin (Columbia River Basin)	Yes	3
South Platte River Basin (Missouri River Basin)	No	5
Tongue River Basin (Missouri River Basin)	Yes	24
Yellowstone River Basin (Missouri River Basin)	No	-

3.3.2 Wetlands

The Wyoming Joint Ventures Steering Committee (WJVST) estimates that 1.4 million acres (ac) (567,000 hectares (ha)) of wetlands occur in Wyoming, covering about 2 percent of the State (WJVSC 2010). Although wetlands are not common in Wyoming, they are an important habitat used by approximately 90 percent of wildlife species (daily or seasonally) and 70 percent of bird species. In addition to providing wildlife habitat, wetlands provide valuable functions such as flood attenuation, aquifer recharge/discharge, sediment filtering, contaminant removal, erosion control, and biomass export (WJVSC 2010). As previously noted, wetlands are particularly important to sage-grouse during late brood-rearing.

Floodplains include both wetland and riparian habitats associated with rivers and streams. U.S. Executive Order 11988 (42 FR 26951; May 24, 1977) requires Federal agencies to avoid to the extent possible long and short-term adverse impacts associated with modification or development of flood plains.

3.4 Land Use and Ownership

The information in this section is summarized from the umbrella CCAA. Approximately 17 million ac (7 million ha) of non-Federal lands occur within the current range of the sage-grouse in Wyoming and are covered under this EA. Prior to settlement of these lands, most of the area was likely native shrub-steppe habitat and therefore, potential sage-grouse habitat. However, some of the land has been converted to other uses such as livestock grazing, crop production, and exurban development (e.g., density of one home per 40 ac). Livestock production is the dominant land use in the Project Area. Much of that production occurs in sagebrush habitat. Large ranching operations maintain intact habitat with minimal roads, power lines, and human intrusions compared to more intensive land uses. Energy development can further modify sage-grouse habitat. Approximately 75 percent of Core Population Areas in the State are at risk from oil and gas and wind development (Doherty 2008). At present, there are nearly 24 million ac (10 million ha) of sagebrush in Wyoming; approximately 47 percent is under BLM management, 38 percent is privately-owned, 7 percent is State-owned, 4 percent is managed by USFS, 4 percent is BIA-owned, and other Federal agencies own lesser amounts (Connelly et al. 2004).

3.5 Socioeconomics

The information in this section is largely summarized from the umbrella CCAA. Wyoming is the least populous State with a total population of 563,626, according to the 2010 census. Statewide, the majority of the population (86.2 percent) is white, 8.1 percent is Hispanic or Latino, and 2.6 percent is Native American. According to U.S. Census data, between 2000 and 2005, Wyoming ranked 31st nationally in population growth; however, Wyoming moved to 9th place by 2007. The recent increase in population indicates that Wyoming is growing at a rate similar to its neighboring states. Wyoming's growth over the last 15 years has been primarily in rural exurban areas. Growth is typically measured by year-round residents captured by U.S. Census data. However, census data does not include second homes, which are typically located in rural areas (Taylor and Lieske 2002). Because second homes are not included in census data, growth in rural areas tends to be under-represented; especially considering Wyoming had a 30 percent increase in second homes for the 2000 census (Taylor and Lieske 2002). After a high in 1993 of nearly $200 million, net proprietor income for agriculture in Wyoming averaged less than $40 million per year through 2006, with drought resulting in negative income in 2002 and 2006 (Hulme et al. 2009). Despite the recent lower levels of profitability for agriculture, the average price of a ranch in Wyoming increased by more than three times on a production-unit basis from 1993-1995 and 2002-2004. Similarly, the average price for irrigated meadowland in Wyoming has nearly doubled (Taylor 2003).

3.6 Cultural and Historic Resources

Approval of the umbrella CCAA is considered an "undertaking" covered by the Advisory Council on Historic Preservation. Therefore, the FWS must comply with section 106 of the National Historic Preservation Act (NHPA) (36 CFR 800). The undertaking is the implementation of conservation measures that would occur once the umbrella CCAA is approved. Section 106 requires the FWS to assess and determine the potential effects on historic properties that could result from the proposed undertaking and to develop measures that would avoid or mitigate any adverse effects. Cultural and historic sites in Wyoming typically highlight significant homesteading, ranching, or farming properties; or military sites.

3.7 Environmental Justice

U.S. Executive Order 12898 directs Federal agencies to "make…achieving environmental justice part of its mission" and to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations." According to the Environmental Protection Agency's Environmental Justice Viewer, in counties with sage-grouse habitat, the average percentage of minorities was approximately 11 percent and the average percentage of people below the poverty level was approximately 7 percent]), in 2010 (http://epamap14.epa.gov/ejmap/entry.html [accessed September 12, 2012]).

4. ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVE ACTIONS

4.1 Sagebrush Habitat

4.1.1 Sage-grouse

4.1.1.1 No Action Alternative

Under the No Action Alternative, the FWS would not enter into a statewide umbrella CCAA for sage-grouse, and no assurances or section 10(a)(1)(A) enhancement of survival permits would be issued under such a CCAA. While private landowners would likely continue within other programs to implement conservation on the ground to conserve the sage-grouse (e.g., Farm Bill Programs such as WHIP, EQIP and others, as well as the NRCS Sage Grouse Initiative), it is unlikely that the full suite of conservation measures that could be implemented within the context of the CCAA would be implemented.

4.1.1.2 Landowner by Landowner Alternative

Under the Landowner by Landowner Alternative, the FWS would not utilize an umbrella CCAA, but could enter into individual CCAAs and provide the accompanying assurances through section 10(a)(1)(A) enhancement of survival permits to participating non-Federal landowners. Therefore, some beneficial effects to sage-grouse habitat would accrue. However, landowner participation would likely be less than under the Proposed Action Alternative due to the additional time and expense necessary to implement individual CCAAs without guidance from an umbrella CCAA. Consequently, the impacts would be

intermediate between the No Action Alternative and the Proposed Action Alternative, with adverse impacts less than those described under the No Action Alternative, and beneficial impacts less than those described under the Proposed Action Alternative.

4.1.1.3 Proposed Action Alternative

Under the Proposed Action Alternative, sage-grouse would benefit from a statewide, comprehensive strategy to address threats associated with ranch management. Under the Proposed Action Alternative, the FWS would issue assurances and individual 10(a)(1)(A) enhancement of survival permits to participating non-Federal landowners that enroll in individual CCAAs under the framework of a statewide umbrella CCAA. Conservation measures would be implemented on a site-specific basis according to individual CCAAs linked to an umbrella CCAA. The conservation measures detailed in the umbrella CCAA would benefit sage-grouse by:

- Reducing habitat fragmentation;
- Reducing disruptions to sage-grouse activities;
- Maintaining or improving habitat quality and quantity;
- Reducing vulnerability to predation;
- Reducing mortality due to collision with fences and other infrastructure;
- Reducing spread of noxious weeds;
- Reducing likelihood of wildfires and subsequent impacts from fire;
- Reducing mortality from disease;
- Minimizing adverse impacts from grazing; and
- Maintaining insects as a seasonally important food item.

Minimal incidental take is expected as a result of proper implementation of the conservation measures, and normal ranching operations maintaining healthy sagebrush ecosystems is expected. The majority of incidental take likely will be in the form of harassment or death during haying and mowing, strikes on fences and other ranch infrastructure, and fragmentation of intact sagebrush landscapes. The umbrella CCAA estimates that a small level of incidental take will occur from ranching activities, and describes a formula for calculating anticipated take using statewide estimates of sage-grouse and sagebrush, the number of acres enrolled, and an anticipated take of 5 percent from ranching activities.

We cannot predict the number of landowners and acreage that would enroll in this program. Consequently, we cannot quantify the actual take that may result from implementation of this umbrella CCAA. However, we developed a simple estimator using a statewide estimate of sage-grouse abundance, the total area of sagebrush statewide, the number of acres enrolled by an individual landowner, and an allowable take of 5 percent from ranching activities. We assumed approximately 208,000 sage-grouse are in Wyoming (75 FR 13910; March 23, 2010). We also assumed that the total area of sagebrush habitats within the State is approximately 43,000,000 ac (17,500,000 ha) (FWS unpublished GIS data). This equals a statewide average density of approximately 0.005 birds per ac (0.01 birds per ha) of sagebrush. The number of acres enrolled by a landowner multiplied by the statewide average density of sage-grouse provides an estimate of the number of birds on the enrolled property. The number of birds on the property multiplied by an allowable take of 5 percent determines the annual allowable incidental take for the enrolled property. For example, if a landowner enrolls 1,000 ac, he will have an annual allowable incidental take of 0.25 birds (1000 ac x 0.005 birds per acre x 0.05 allowable take = 0.25 birds). Therefore, over the 20 year duration of the individual CCAA, an allowable incidental take of 5 birds would be authorized in the landowner's section (10)(a)(1)(A) permit.

We recognize that this formula for incidental take does not consider variations in habitat quality or hunting intensity between enrolled properties. However, we believe that this is a reasonable approach given the complexities of annually assessing each enrolled property to determine the number of sage-grouse present. We also recognize that annual allowable take may be less than one bird, depending on the number of acres enrolled. However, if take is assessed over multiple years, we gain a degree of flexibility in determining take.

The FWS anticipates that negative effects to sage-grouse from the small level of incidental take that may occur under the Proposed Action Alternative would be outweighed by the combined implementation of conservation measures by enrolled landowners to result in a net benefit to sage-grouse. .

4.1.2 Other Wildlife

4.1.2.1 No Action Alternative

Current land uses would continue, and wildlife management would be through existing regulatory mechanisms (see section 2.1). Consequently, it is anticipated that existing threats would continue for other wildlife species that utilize sagebrush habitat, including sensitive species, sagebrush obligate species, and species of greatest conservation need. Many of these species would continue to be negatively affected by fragmentation of existing native sagebrush habitat, conversion of sagebrush habitat for other uses, and a decline in habitat quality from the threats described in section 3.2.1.

4.1.2.2 Landowner by Landowner Alternative

Under the Landowner by Landowner Alternative, some beneficial effects to sage-grouse and other wildlife species that utilize sagebrush habitat would accrue from conservation measures implemented in individual CCAAs. However, landowner participation would likely be less than under the Proposed Action Alternative due to the additional time and expense necessary to implement individual CCAAs without guidance from an umbrella CCAA. Consequently, the impacts would be intermediate between the No Action Alternative and the Proposed Action Alternatively, with adverse impacts less than those described under the No Action Alternative, and beneficial impacts less than those described under the Proposed Action Alternative.

4.1.2.3 Proposed Action Alternative

The conservation measures described in the umbrella CCAA are specifically intended to benefit sage-grouse. However, other species that inhabit sagebrush ecosystems, particularly sagebrush obligates and sagebrush ecosystem species of greatest conservation need (see section 2.2.2) also would benefit from the conservation measures discussed in section 4.1.1.3. The conservation measures detailed in the umbrella CCAA would benefit other wildlife by:

- Reducing habitat fragmentation;
- Reducing disruptions to feeding, nesting, and other activities of wildlife utilizing sagebrush habitat;
- Maintaining or improving sagebrush habitat quality and quantity;
- Reducing vulnerability of susceptible wildlife to predation;
- Reducing avian mortality due to collision with fences and other infrastructure;
- Reducing spread of noxious weeds;
- Reducing likelihood of wildfires and subsequent impacts from fire;
- Reducing mortality from disease;
- Minimizing adverse impacts from grazing; and
- Maintaining insects as a food item for other wildlife species.

Approval of the umbrella CCAA and implementation of appropriate conservation measures would benefit sage-grouse and other wildlife species by improving habitat and ameliorating other conditions that currently contribute to direct and indirect adverse effects. We anticipate that impacts under the Proposed Action Alternative could result in long-term benefits to other wildlife species that utilize sagebrush habitats.

4.1.3 Threatened and Endangered Species

4.1.3.1 No Action Alternative

Under the No Action Alternative, current land uses would continue, and management of threatened and endangered species would be conducted through requirements of the ESA and other existing regulatory mechanisms. Effects to candidate and listed species would continue to be analyzed on a case-by-case basis, with limited opportunity to manage their conservation at a landscape level. Any future proposed activities having a Federal nexus (e.g., Federal programs and/or funding), and for which prior consultation has not occurred, that might affect a listed or proposed species would undergo section 7 consultations in accordance with ESA. Consequently, if the sage-grouse were listed under the ESA, there would be a substantially increased time needed for project reviews of any related Federal programs and activities.

The threatened and endangered species currently listed under ESA in Wyoming are not sagebrush-dependent and typically use sagebrush habitats incidentally or use adjacent habitats. The endangered black-footed ferret is the listed species most likely to be found in sagebrush habitat. It currently occurs in one reintroduced population in Shirley Basin and is dependent on prairie dogs for food and on their burrows for shelter. Two species of prairie dogs occur in Wyoming – white-tailed prairie dog, which utilizes desert grassland and shrub grasslands, and black-tailed prairie dog (*Cynomys ludovicianus*), which utilizes grasslands. The white-tailed prairie dog is found in Shirley Basin.

Several listed species (Kendall warm springs dace, Ute ladies'-tresses, Prebles's meadow jumping mouse, and yellow-billed cuckoo) are associated with riparian habitats. Habitat surrounding these riparian areas may include sagebrush. As indicated in Table 3 above, sources of impairment are unknown for forty-four percent of Wyoming streams. Eighteen percent are impaired by natural sources, with several sources of impairment contributing to the remaining thirty-eight percent. Consequently, it is unclear what effects may occur to riparian habitats and stream water quality under the No Action Alternative.

4.1.3.2 Landowner by Landowner Alternative

Threatened and endangered species currently listed under ESA in Wyoming are not sagebrush-dependent and typically use sagebrush habitats incidentally or use adjacent riparian and wetland habitats. Conservation measures that would be developed under individual CCAAs would be specifically intended to benefit sage-grouse and are expected to have limited impact, positive or negative, on most threatened and endangered species in Wyoming. Landowner participation would likely be less than under the Proposed Action Alternative due to the additional time and expense necessary to implement individual CCAAs without guidance from an umbrella CCAA. Consequently, the impacts would be intermediate between the No Action Alternative and the Proposed Action.

4.1.3.3 Proposed Action Alternative

We expect that the conservation measures described in the umbrella CCAA and those likely to be included in individual CCAAs under the Proposed Action Alternative to be largely the same as conservation measures potentially implemented under the Landowner by Landowner Alternative. However, we expect higher and more widespread levels of landowner participation in the Proposed Action Alternative. Therefore, the types of impacts to threatened and endangered species would be the same as described in the Landowner by Landowner Alternative, but would be at increased levels.

An additional, and very substantial, benefit under the Proposed Action Alternative is that any future proposed activities having a Federal nexus (e.g., Federal programs and/or funding), and for which prior consultation has not occurred that might affect the sage-grouse, would undergo streamlined section 7 consultations. Consequently, if the sage-grouse were listed under the ESA, there would be a substantially reduced time needed for reviews of any project having a Federal nexus.

4.2 Water Resources

4.2.1 No Action Alternative

Because conservation measures associated with the umbrella CCAA would not be implemented, effects from implementing conservation measures that are potentially beneficial to water resources would not occur under the No Action Alternative. Current ranch management practices would continue, and management of water resources would be at the discretion of individual landowners and through existing regulatory mechanisms. However, as indicated in Table 3 above, sources of impairment are unknown for forty-four percent of Wyoming streams. Eighteen percent are impaired by natural sources, with several sources of impairment contributing to the remaining thirty-eight percent. Consequently, it is unclear what effects—if any—may occur to riparian habitats and stream water quality under the No Action Alternative.

4.2.2 Landowner by Landowner Alternative

Some of the conservation measures likely to be included in individual CCAAs under this alternative could benefit water resources through habitat restoration and wildfire prevention that would reduce erosion off of degraded rangeland into water bodies. Improved placement of stock tanks and other water development features could also minimize erosion into water bodies. Fencing riparian habitat from livestock would encourage establishment of riparian species that stabilize soil and stream banks. Because landowner participation would likely be less than under the Proposed Action Alternative, the impacts would be intermediate between the No Action Alternative and the Proposed Action Alternative, with adverse impacts less than those described under the No Action Alternative, and beneficial impacts less than those described under the Proposed Action Alternative.

4.2.3 Proposed Action Alternative

We expect that the conservation measures described in the umbrella CCAA and those likely to be included in individual CCAAs under the Proposed Action Alternative to be largely the same as conservation measures potentially implemented under the Landowner by Landowner Alternative. However, we expect higher and more widespread levels of landowner participation in the Proposed Action Alternative. Therefore, the types of impacts to water resources would be the same as described in the Landowner by Landowner Alternative, but would be at increased levels. Approval of the umbrella CCAA and implementation of these conservation measures could result in beneficial impacts to water quality and quantity in the 12 Wyoming river basins with substantial sagebrush habitat.

4.3 Land Use and Ownership

4.3.1 No Action Alternative

While private landowners would likely continue within other programs to implement conservation on the ground to conserve the sage-grouse (e.g., Farm Bill Programs such as EQIP, WHIP and others, as well as the NRCS Sage Grouse Initiative), it is unlikely that the full suite of conservation measures that could be implemented within the context of the CCAA would be implemented. Non-Federal landowners would not be provided ESA incidental take authorization for the sage-grouse in advance of a listing of the species. Therefore, some landowners would continue to be concerned about the potential regulatory implications of having sage-grouse on their land. This atmosphere may inhibit non-Federal landowner cooperation to conserve the species. However, we do not anticipate changes in land ownership resulting from the No Action Alternative. Although we do not anticipate changes in land use from one type to another as a result of this alternative, some landowners may modify land management to deter use by sage-grouse to avoid potential restrictions in anticipation of a possible listing. We expect that a relatively small number of landowners may take such steps.

4.3.2 Landowner by Landowner Alternative

Because landowners would have the option to develop individual CCAAs, we do not expect that landowners would feel compelled to change land management to deter sage-grouse use as they might under the No Action Alternative. Regulatory assurances conferred to enrollees would provide incentive to maintain ranching operations and lessen the likelihood of lands being sold and divided for exurban development. However, because landowner participation would likely be less than under the Proposed Action Alternative, the impacts to land use would be intermediate between the No Action Alternative and the Proposed Action Alternative, with adverse impacts less than those described under the No Action Alternative, and beneficial impacts less than those described under the Proposed Action Alternative. We anticipate minimal changes in land ownership under the Landowner by Landowner Alternative. We anticipate that the voluntary incorporation of conservation measures by non-Federal landowners would result in improved conservation of sage-grouse, while maintaining current land uses related to ranching practices.

4.3.3 Proposed Action Alternative

We expect that the conservation measures described in the umbrella CCAA and those likely to be included in individual CCAAs under the Proposed Action Alternative to be largely the same as conservation measures potentially implemented under the Landowner by Landowner Alternative. However, we expect higher and more widespread levels of landowner participation in the Proposed Action Alternative. Therefore, the types of impacts to land use would be the same as described in the Landowner by Landowner Alternative, but would be at increased levels. We anticipate minimal changes in land ownership. We anticipate that the voluntary incorporation of conservation measures by non-Federal landowners would result in improved conservation of sage-grouse, while maintaining current land uses related to ranching practices.

4.4 Socioeconomics

4.4.1 No Action Alternative

If the species is listed under ESA, landowners may have to modify their land use practices to avoid harming the sage-grouse or its habitat. However, we anticipate little or no long-term changes in socioeconomic impacts under the No Action Alternative.

4.4.2 Landowner by Landowner Alternative

As discussed more fully under the Proposed Action Alternative, short-term costs to the landowner from implementing conservation measures would be off-set by the long-term cost benefits. However, landowner participation would likely be less than under the Proposed Action Alternative due to the additional time and expense necessary to implement individual CCAAs without guidance from an umbrella CCAA. Consequently, the impacts would be intermediate between the No Action Alternative and the Proposed Action Alternative, with adverse impacts less than those described under the No Action Alternative, and beneficial impacts less than those described under the Proposed Action Alternative. We anticipate that there would be long-term, minor socioeconomic benefits under the Landowner by Landowner Alternative.

4.4.3 Proposed Action Alternative

We expect that the conservation measures described in the umbrella CCAA and those likely to be included in individual CCAAs under the Proposed Action Alternative to be largely the same as conservation measures potentially implemented under the Landowner by Landowner Alternative. However, we expect higher and more widespread levels of landowner participation in the Proposed Action Alternative. Therefore, the socioeconomic impacts would be similar to those described in the Landowner by Landowner Alternative. The FWS and other participating agencies would provide technical assistance to aid landowners in implementing conservation measures that could provide a minor

economic benefit to landowners including: assistance in developing or revising grazing management or conservation plans; assistance with monitoring; completing individual CCAA enrollment documentation; providing mediation, facilitation, or other dispute resolution processes; and locating and applying for financial assistance for implementation of conservation measures. A full list of the technical assistance that would be provided by the FWS and other participating agencies is detailed in the umbrella CCAA.

Implementation of some conservation measures may involve a monetary investment for individual ranchers (e.g., construct, relocate, or redesign fences); however, participation is voluntary. Therefore, we presume that the landowner would evaluate the costs and benefits associated with a conservation measure prior to undertaking the measure, and any financial investment by the landowner would not be a burden. Other conservation measures do not have a direct monetary cost associated with them (e.g., avoid placing salt or supplements within 0.25 mi (0.4 km) of riparian habitats). Outside funding sources (e.g., through the FWS Partners for Fish and Wildlife Program) may be available to assist with implementation of some conservation measures; funding will be dependent on the availability of funding sources and the decision of the landowner to apply for funding. A landowner's decision to participate in an umbrella CCAA should include a cost/benefit evaluation of potential costs and commitments in exchange for assurances.

We anticipate that short-term costs to the landowner from implementation of conservation measures would be off-set by the long-term benefits; overall, impacts under the Proposed Action Alternative would result in long-term, minor socioeconomic benefits.

4.5 Cultural and Historic Resources

4.5.1 No Action Alternative

Because conservation measures associated with the umbrella CCAA would not be implemented, no additional impacts to cultural and historic resources would occur as a result of this alternative.

4.5.2 Landowner by Landowner Alternative

As part of the individual CCAA application process, the FWS must determine if implementation of any conservation measure would directly or indirectly change the character or use of historic properties included in or eligible for inclusion in the National Register of Historic Places, and make a reasonable effort to identify undiscovered historic properties. The FWS must consult with the State Historic Preservation Officer (SHPO), affected Tribes, and other interested parties concerning cultural and historic resources, and consider their comments during project planning.

Individual CCAAs for sage-grouse and ranching activities are likely to contain the same types of measures in the umbrella CCAA under the Proposed Action Alternative. Because of established

procedures and FWS policies to consult with the Advisory Council on Historic Preservation, the SHPO, affected Tribes and other interested parties, we do not anticipate any impacts to cultural or historic properties are anticipated as a result of the Landowner by Landowner Alternative. However, should the FWS determine that impacts might occur from additional measures in an application for an individual CCAA, steps would be taken to avoid or minimize those impacts, as well as disclose such efforts for public review under the NEPA process for that CCAA.

4.5.3 Proposed Action Alternative

As part of the individual CCAA application process, the FWS must determine if implementation of any conservation measure would directly or indirectly change the character or use of historic properties included in or eligible for inclusion in the National Register of Historic Places, and make a reasonable effort to identify undiscovered historic properties. The conservation measures described in the umbrella CCAA propose minimizing or eliminating disturbances related to ranch management activities in order to reduce habitat fragmentation and improve habitat quality. None of the measures, including the construction, relocation, or redesign of fences, would require dismantling or damaging historic structures. Consequently, no impacts to cultural or historic properties are anticipated as a result of the Proposed Action Alternative.

4.6 Environmental Justice

4.6.1 No Action Alternative

Under the No Action Alternative, the FWS would not enter into any CCAAs, and no ESA assurances through section 10(a)(1)(A) enhancement of survival permits would be issued. There would be no implementation of conservation measures associated with the umbrella CCAA. Therefore, no additional impacts on minority or low-income populations would occur.

4.6.2 Landowner by Landowner Alternative

Under the Landowner by Landowner Alternative, the FWS would not utilize an umbrella CCAA, but could enter into individual CCAAs and the accompanying assurances through section 10(a)(1)(A) enhancement of survival permits with participating non-Federal landowners. However, landowner participation would likely be less than under the Proposed Action Alternative due to the additional time and expense necessary to implement individual CCAAs without guidance from an umbrella CCAA. As noted in section 3.8, in Wyoming counties with sage-grouse habitat, the average percentage of minorities was approximately 11 percent, and the average percentage of people below the poverty level was approximately 7 percent in 2010. However, enrollment in an individual CCAA is not required of

landowners who prefer not to participate. Therefore, we anticipate no impacts on minority or low-income populations under the Landowner by Landowner Alternative.

4.6.3 Proposed Action Alternative

As noted in the Landowner by Landowner Alternative, enrollment in an individual CCAA is voluntary; therefore, we anticipate no impacts on minority or low-income populations under the Proposed Action Alternative.

5. CUMULATIVE EFFECTS

NEPA defines cumulative effects as the incremental environmental impact or effect of an action together with impacts of past, present, and reasonable foreseeable future actions, regardless of what agency or person undertakes such other actions and can result from individually minor, but collectively significant activities taking place over a period of time (40 CFR 1508.7). The FWS must determine whether the impacts of the proposed action, when taken together with other ongoing activities such as the Thunder Basin Grassland Prairie Ecosystem CCAA, would result in a significant environmental impact. The proposed action is the approval and implementation of the *Greater Sage-Grouse Umbrella CCAA for Wyoming Ranch Management*, which will streamline the process of completing individual CCAAs. Non-Federal landowners, who choose to participate, voluntarily agree to implement certain conservation measures for sage-grouse on their property. The environmental consequences to any resources potentially affected by the proposed action would be beneficial, as described in the previous section. Therefore, the cumulative effects from incremental impacts of the proposed action, when added to other past, present, and reasonably foreseeable future activities within the Project Area, will not adversely impact any of these resources.

This analysis of cumulative effects also includes consideration of ongoing and projected changes in climate. The terms "climate" and "climate change" are defined by the Intergovernmental Panel on Climate Change (IPCC). "Climate" refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007). The term "climate change" refers to a change in the mean or variability of one or more measures of climate, such as temperature or precipitation, that persists for an extended period, typically decades or longer, whether due to natural variability, human activity, or both (IPCC 2007). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative, and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (IPCC 2007). Some of the threats to sage-grouse identified in the umbrella CCAA (e.g., drought, invasive plants species, wildfires, overgrazing, and loss of riparian habitat) may be exacerbated by climate change. The conservation measures that address these potential threats will help to ameliorate these adverse effects.

It is reasonable to conclude that increased landowner participation in the umbrella CCAA will either result in increased beneficial effects for sage-grouse and the other resources identified and analyzed in this EA (i.e., vegetation, wildlife, threatened and endangered species, water resources, socioeconomic

resources), or have no impact on that resource (cultural and historic resources and environmental justice). Beneficial effects will accrue through widespread implementation of conservation measures that reduce the loss, deterioration, and fragmentation of sage-grouse habitat. There is the potential for a minimal amount of incidental take as part of the regulatory assurances provided in section 10(a)(1)(A) enhancement of survival permits that would be issued in conjunction with the individual CCAAs. However, potential losses due to incidental take will be off-set by the implementation of conservation measures that will improve sage-grouse habitat and increase sage-grouse distribution and abundance in Wyoming.

It is also reasonable to conclude that ongoing activities within the Project Area such as livestock grazing, exurban development, and energy development will continue to have adverse impacts on these same resources through increased loss, deterioration, and fragmentation of sage-grouse habitat. These impacts are described in more detail in section 4 in discussions of the No Action Alternative. However, with the approval and implementation of the umbrella CCAA, impacts from ranching activities on non-Federal lands would be expected to diminish due to participation in the umbrella CCAA, which addresses such impacts. Federal lands may also be enrolled in a Candidate Conservation Agreement (CCA). Upon request of private landowners, it is anticipated that CCAs will be developed simultaneously with CCAAs for individuals who have grazing permits on those Federal lands. When these CCAs are completed, conservation measures should reach seamlessly across property types, regardless of ownership. Conservation measures proposed in the umbrella CCAA, in addition to other ongoing statewide efforts to conserve sage-grouse including: (1) the Wyoming Governor's Executive Order 2011-5, (2) the State's eight Sage-grouse Working Groups, (3) BLM policy regarding sage-grouse habitat management, (4) the NRCS sage-grouse conservation efforts, and (5) efforts of the WGFD and other agencies to gather data, monitor the status, and protect sage-grouse and their habitat, will result in net beneficial impacts for all of the identified resources, particularly sage-grouse.

6. REFERENCES

Aldridge, C., S. Nielsen, H. Beyer, M. Boyce, J. Connelly, S. Knick, and M. Schroeder. 2008. Range-wide patterns of greater sage-grouse persistence. Diversity and Distributions 2008(14):983-994.

Bates Hole/Shirley Basin Sage-grouse Working Group. 2007. The Bates Hole/Shirley Basin Sage-grouse Conservation Plan. January 10, 2007. 109 pp.

Braun, C. 2006. A blueprint for sage-grouse conservation and recovery. 2006. Grouse Inc. Tucson, Arizona. 26 pp.

Big Horn Basin Sage-grouse Local Working Group. 2007. Sage-grouse Conservation Plan for the Big Horn Basin, Wyoming. August 31, 2007. 124 pp.

Connelly, J., S. Knick, M. Schroeder, and S. Stiver. 2004. Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming. 611 pp.

Doherty, K. 2008. Sage-grouse and energy development: integrating science with conservation planning to reduce impacts. PhD Dissertation University of Montana. 137 pp.

Hulme, D., C. Andersen, K. Parady, J. Hamerlinck, S. Lieske, and I. Burke. 2009. Wyoming's state of the space: a comprehensive review of land use trends in Wyoming. W. D. Ruckelshaus Institute of Environment and Natural Resources. University of Wyoming, Laramie, Wyoming. 70 pp.

Intergovernmental Panel on Climate Change. 2007. Climate Change 2007: Synthesis Report. 52 pp.

Jordan, R. and S. DeBoer. 1996. Wyoming – A Source Book. University Press of Colorado, Niwot, CO.

Northeast Wyoming Sage-grouse Working Group. 2006. Northeast Wyoming Sage-Grouse Conservation Plan. August 15, 2006. 177 pp.

Schroeder, M., C. Aldridge, A. Apa, J. Bohne, C. Braun, S. Bunnell, J. Connelly, P. Deibert, S. Gardner, M. Hilliard, G. Kobriger, S. McAdam, C. McCarthy, J. McCarthy, L. Mitchell, E. Rickerson, and S. Stiver. 2004. Distribution of sage-grouse in North America. The Condor 106(2):363-376.

South Central Sage-grouse Working Group. 2007. South Central Sage-Grouse Conservation Plan. March 14, 2007. 81 pp.

Southwest Wyoming Local Sage-grouse Working Group. 2007. Southwest Wyoming Sage-grouse Conservation Assessment and Plan. July 17, 2007. 109 pp.

Stiver, S., A. Apa, J. Bohne, S. Bunnell, P. Deibert, S. Gardner, M. Hilliard, C. McCarthy, and M. Schroeder. 2006. Greater sage-grouse comprehensive conservation strategy. Western Association of Fish and Wildlife Agencies. Unpublished Report. Cheyenne, Wyoming. 442 pp.

Taylor, D. 2003. The role of agriculture in maintaining open spaces in Wyoming. Department of Agriculture and Applied Economics. Wyoming Cooperative Extension Service Bulletin B-1141. University of Wyoming, Laramie, Wyoming.

Taylor, D. and S. Lieske. 2002. Population growth in Wyoming, 1990-2000/ Information Bulletin for the Open Spaces Partnership #1121, Institute for the Environment and Natural Resources and Cooperative Extension Services, University of Wyoming, Laramie, Wyoming.

Upper Green River Basin Sage-Grouse Working Group. 2007. Upper Green River Basin Sage-Grouse Conservation Plan. May 24, 2007. 147 pp.

Upper Snake River Basin Local Sage-grouse Working Group. 2008. Upper Snake River Basin Sage-Grouse Conservation Plan. January, 2008. 160 pp.

Wind River/Sweetwater River Local Sage-grouse Working Group. 2007. Wind River/ Sweetwater River Local Sage-Grouse Conservation Plan. August 3, 2007. 108 pp.

Wyoming Department of Environmental Quality Water Quality Division. 2010. Wyoming Water Quality Assessment and Impaired Waters List (2010 Integrated 305(b) and 303(d) Report). Document #10-230. Cheyenne, Wyoming.

Wyoming Game and Fish Department. 2005. A Comprehensive Wildlife Conservation Strategy for Wyoming. Wyoming Game and Fish Department, Cheyenne, Wyoming.

Wyoming Game and Fish Department. 2010. Annual Report of Small and Upland Game Harvest 2009. Wyoming Game and Fish Department, Cheyenne, Wyoming.

Wyoming Interagency Vegetation Committee. 2002. Wyoming Guidelines for Managing Sagebrush Communities with Emphasis on Fire Management. Wyoming Game and Fish Department and Wyoming Bureau of Land Management, Cheyenne, Wyoming.

Wyoming Joint Ventures Steering Committee. 2010. Wyoming Wetlands Conservation Strategy. Version 1.0. September 7. Unpublished technical report. Available online at http://gf.state.wy.us/habitat/WetlandConservation/Wyoming%20Wetlands%20Conservation%20Strategy%20September%207,%202010.pdf.