

Western Governors' Wildlife Council
Wildlife Pilot Proposal – Concept Paper template
DRAFT

Primary State Contacts:

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Pilot Title: Identifying crucial habitats and corridors for resident fish and caribou Alaska's North Slope

General Description: The purpose of this pilot project is to 1) prepare spatial data for respective aquatic/resident fish, 2) consolidate up to 4 of the spatial datasets for the arctic migratory caribou herds, 3) work with partners to prepare metadata incorporating base maps and fish and wildlife data, and 4) demonstrate capabilities to apply the WGA guidelines to define crucial habitats and corridors. Partners include the State of Alaska's – Department of Natural Resources and the North Slope Science Initiative (a consortium of local, state, federal governments [e.g., departments of Energy, Interior] and various NGO's, industry [e.g., Conoco Philips] and university partners [e.g., University of Alaska – Fairbanks]).

Secondary State Partners: None. Key partners for this project include major land management agencies on the North Slope including the Bureau of Land Management, U.S. Fish and Wildlife Service, Department of Natural Resources, and the Arctic Slope Regional Corporation (North Slope Borough).

Energy Nexus: Oil and gas development continues to expand across Alaska's North Slope and while the land footprint for drilling is greatly reduced from a few decades ago, there is still significant infrastructure associated with work crews, roads, and especially pipelines and other transmission corridors. This cumulative development is taking place across largely pristine and unfragmented arctic habitats that have resident fish and caribou herds. Interactions between these fish and wildlife resources and energy development must focus on ways to identify crucial and important habitats early in project planning and across land jurisdictions to display possible issues, aid in decision-making and minimize conflict.

Desired outcomes (6 mo and 12 mo): 6 months – a) *caribou* – choose among the Western Arctic, Teshukpuk, Central Arctic, and Porcupine caribou herd spatial datasets and develop data standards and metadata compatible with existing base maps; b) *fish/aquatic* – choose spatial aspects of the Alaska Freshwater Fish Inventory and work with cooperators to evaluate and merge with base maps. 12 months – a) *caribou* – conduct demonstration geospatial analysis of important caribou calving ground and migration corridors; b) *fish/aquatic* – conduct demonstration geospatial analysis of important resident fish and aquatic habitats.

DSS advancement: Decision-making systems involving oil and gas development and impacts to resident wildlife and aquatic resources will be enhanced by this pilot project. This will be one of the first attempts by the State of Alaska to evaluate these resources apart from a specific development project. Therefore, the science and mapping can be independent from any given activity and focus on meeting fish and

wildlife management objectives. There are a few ways in which this will help advance a decision support system. First, long-term caribou spatial data will be summarized using standard protocols with associated meta-data. This can be used in association with the Geographic Information Network of Alaska (GINA) and include partners such as the many agencies that are part of the North Slope Science Initiative and the Alaska Department of Natural Resources. Results and summary information will be readily useable by those planning oil, gas and related projects (e.g., transmission corridors). Finally, long-term spatial data summaries of aquatic and wildlife resources on the North Slope that are compatible with other information in GINA are very useful for evaluating climate change. Such projects are now being planned by a variety of agencies and academic institutions.

Western Governors' Wildlife Council
Wildlife Pilot Proposal

Pilot Title:

Development of Crucial Wildlife Habitats and Integrated Decision Support System for the Arid Lands of Idaho, Oregon, and Washington.

Project Objective:

Pilot the conceptualization and coordination of a trans-boundary Decision Support System(DSS) for fish, wildlife, and habitats along the Columbia Plateau Ecoregion (Figure 1) in Idaho, Oregon, and Washington. The pilot will focus on the Arid Lands shrub-steppe, high desert, and associated fish, wildlife, and plant species in Bailey's Ecoregion Sections of the Northwest Basin and Range, Snake River basalts, Owyhee Uplands, High Lava Plains, and Columbia basin sections on the Columbia Plateau ecoregion.

Primary Project Contact: John Pierce

State Contacts:

Gregg Servheen, Idaho Department of Fish and Game, gregg.servheen@idfg.idaho.gov, 208-287-2713

Holly Michael, Oregon Department of Fish and Wildlife, Holly.B.Michael@state.or.us, 503-947-6072

John Pierce, Washington Department of Fish and Wildlife, john.pierce@dfw.wa.gov, 360-902-2511

Project Description:

Phase 1 will focus on a subset of the full complement of habitats and species of the Columbia Plateau ecoregion. Scale, data categories, definitions and data availability will be considered when selecting a subset of fish, wildlife, and plant species associated with the focus ecosystems. The set of selected species will include no less than 1 resident sport fish, at least 1 terrestrial game species from each major species group (ungulates, upland game birds, and lagomorphs), and 4-5 Columbia Plateau habitat obligates of Species of Greatest Conservation Need as identified in our respective Comprehensive Wildlife Strategies. A layer identifying unfragmented landscapes and protected habitats will be created based upon agreed upon data definitions and terms. A species richness layer using Land Cover and species associations will also be explored.

In addition Phase 1 of the project will develop and describe a framework and process for identifying landscape connectivity crucial habitat and a framework for incorporating climate change adaptation considerations in determining and prioritizing crucial habitat. The University of Washington will be contracted to develop the climate change framework. We will evaluate connectivity tools and models in collaboration with NatureServe and the Wildlife

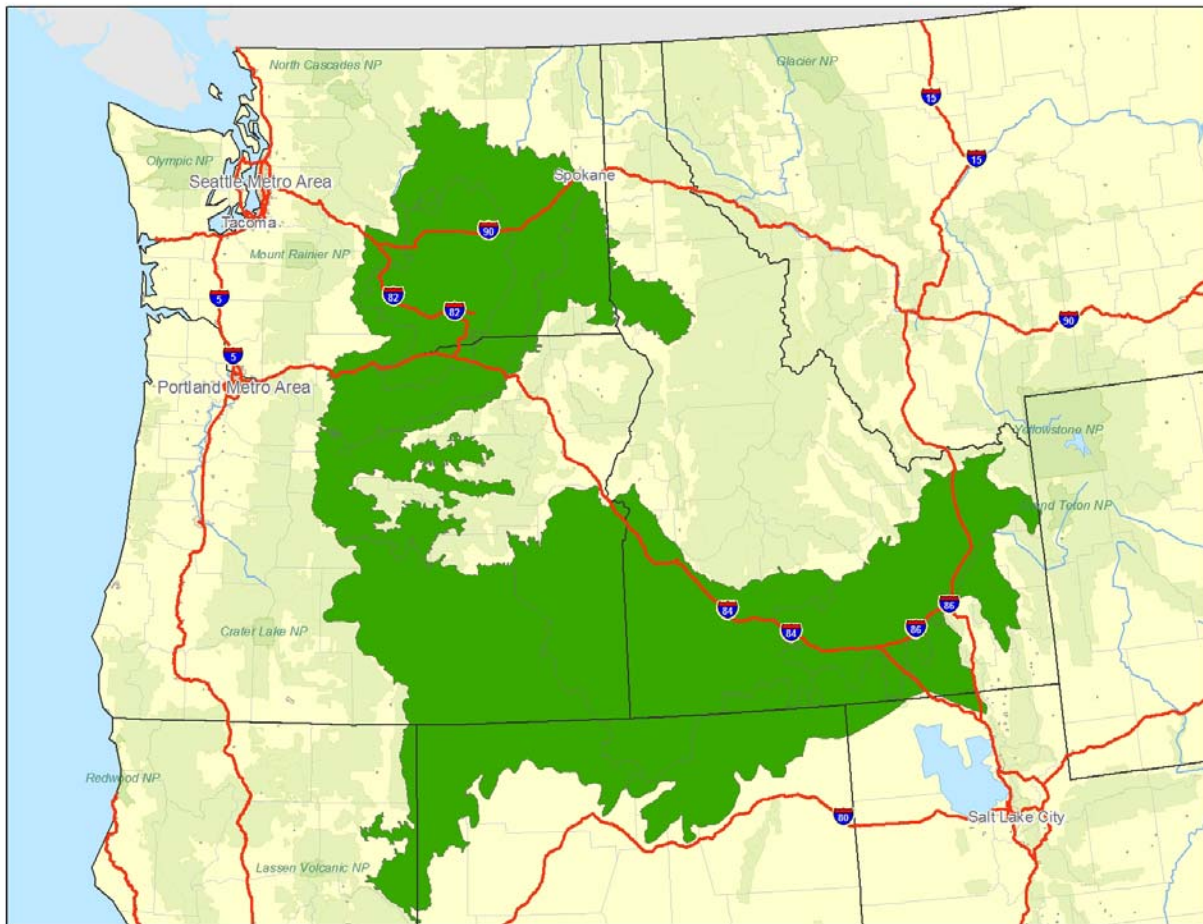


Figure 1. Columbia Plateau Ecoregion, WGA Crucial Habitat Pilot Project Study Area.

Conservation Society's efforts to formulate connectivity best management practices as well as any ongoing connectivity efforts in each state such as the Washington Wildlife Connectivity Working Group (WWHCG). The connectivity assessment will consider resilience, redundancy, species function, and suitability of habitats. Assessment tools, including Corridor Design, FunConn, and Circuitscape, will be evaluated for their relevance to our pilot project situation. A process, data layers, and assessment will be itemized for implementation in Phase 2. The pilot will build off of our previous experiences working on several multi-state coordination activities such as: previous WGA WREZ project; Washington-Oregon connectivity working group meetings; Pacific Northwest Wildlife Connections conference: symposium presentations and informal discussions on cross-

border issues; Washington Wildlife Habitat Connectivity Working Group Transboundary Subcommittee (including Montana, Idaho, Oregon, and WA reps); and a recently held Connectivity and climate change adaptation workshop (OR-WA).

As a result of these previous experiences we have identified several challenges and issues. Many of them are reported in the WGA Science Committee report for the Crucial Habitat and Corridor initiative. Currently different states use different methods for identifying connectivity landscapes – e.g. focal species or landscape integrity. Dataset quality differs from state-to-state. Similarly, a common definition of ‘crucial habitat’ can be difficult to agree – varies between state plans.

Phase 2

The outcomes, processes, and lessons learned from Phase 1 will be used in Phase 2 of our project. Phase 2 will include incorporating the remainder of the species and habitats in the Columbia Plateau ecoregion of Idaho, Oregon, and Washington. Using the processes and lesson learned in Phase 1, we will address scale, categorization, and define all remaining species and habitat data within these sections. Using defined data layers we will assess and categorize information to formulate maps and assessments, up to and including management guidelines, connectivity, climate change, biodiversity, and conservation priorities. Data maps and associated information will be displayed and made available via the mapping service at the end of Phase 2. Funding needs to complete Phase 2 is estimated at approximately \$400,000. Actual funding needs may change depending on our success in securing funds from other sources and in assessing costs and challenges encountered during Phase 1.

Energy Nexus

Recent wind and transmission line development across this ecoregion increases the urgency of carrying out such a pilot project to support siting and mitigation efforts to ensure the connectivity of wildlife across these arid lands. As of June 2009, 1366 MW of wind energy have come online in Washington State since 2001, an additional 812 MW are already approved, and over 2500 MW are in some stage of proposal or permitting (Renewable Northwest Project). Increasingly, there is pressure for such projects to occur on unconverted shrub-steppe habitats. A TNC draft analysis identified just over 8 million acres of lands with possible wind development potential in eastern Washington with 70% posing some threat to wildlife or habitat (Conley et al. 2009). The Bureau of Land Management in Washington State is a large landowner of the Arid Lands area and is taking action to realize capacity to develop renewable energy in such areas. They are entering a plan revision for their lands in eastern Washington, and have expressed an interest in

understanding the intersection of their ownership with important wildlife connectivity areas. In Idaho, the arid lands of the Snake River plain to the west into Oregon are now subject to 2 large transmission line proposals, Gateway West and Boardman/Hemingway, each a 500 kV electric line being developed by Idaho Power. In addition, multiple wind energy projects are proposed, planned or are being built including Cottler Mountain, China Mountain, and numerous private land projects as well as new hydroelectric (Corral Creek South Pumped Storage project). All such power projects are being proposed individually in each state and cumulative impacts at regional and landscape scales are left unaddressed. .

DSS Advancement

- This project will develop a database of crucial habitat for the Columbia Plateau Ecoregion in the three partner states. These data will be designed so they can be in future development of prototype DSS that will be GIS based with Internet interface. The DSS framework would be applicable to all ecoregions in the three states and adaptable useable in landscapes in other western states.
- Products from this project will establish working groups consisting of participants from the three states that will continue data sharing and refinements subsequent to project completion.
- Project plan for identifying crucial habitat and linkages for multiple species, with clearly articulated strategies for incorporating effects of climate change and energy development

Integrate science findings into ongoing conservation prioritization and strategic planning for Arid Lands in the Columbia River Basin and amongst agency and other partners.

Federal and Stakeholder Involvement:

Partners included to date in this overall effort include Washington Department of Transportation, Washington Department of Natural Resources, The Nature Conservancy, Conservation Northwest, the University of Washington, Bureau of Land Management, Wildlife Conservation Society, U.S. Fish and Wildlife Service, U.S. Geological Service and the Washington Habitat Connectivity Working Group

All relevant stakeholders within the pilot area will be contacted at the initiation of the project and be requested to fully participate in terms of expertise, data and information, and comments to formulate the DSS. This list will include but not be limited to:

Conservation Northwest, respective transportation, land management, and environmental quality departments of each state Wildlife Conservation Society, The Nature Conservancy, Nature Serve, and universities.

We will hold at least 3 stakeholder meetings within the landscape we are focusing on for Phase 1. We expect those meetings to be located one in each of the respective pilot states within the Columbia Plateau. We will also convene a technical advisory committee (TAC) consisting of NGO's, Tribes, universities, and others who have technical knowledge, expertise and investment in the area. We will contact and invite participation of all federal and state land management agencies, fish and wildlife managers, environmental managers (EPA, DEQ, DNR). In addition, we will ask each partner to incorporate information about the project on their respective web sites and provide opportunities for public input and involvement via their web sites.

Climate Change

We will incorporate information on the potential impacts of climate change using the best available science related to its effect on and needs for resilience, connectivity, and redundancy in landscapes, habitats, and species functions. Phase 1 climate change steps will include: 1) engaging partners and coordinating across state and regional boundaries; 2) clearly defining goals and objectives in the context of current and future climate conditions; and 3) selection of appropriate spatial and temporal scales for assessing wildlife adaptation needs. Our climate change data development and mapping will be done in coordination with ongoing climate change projects at the University of Washington and the University of Idaho and a Montana Climate Change Working Group. Outputs of these projects, such as vulnerability assessments, as well as consultation with these groups, will be used to form our climate change plan in Phase 1 and implement our climate change layers, mapping, and assessments in Phase 2.

Deliverables

- Complete inventory of GIS data layers for all reference layers and fish, wildlife, and plant data as available in the Columbia Plateau Ecoregion
- A completed data layer defining crucial habitat for selected species and habitats in the focal area.
- Completed connectivity/linkage plan identifying steps, tools, and outcomes for producing a connectivity data layer for the three state project area.
- Completed climate change plan outlining steps, data, vulnerability assessments, and outcomes for producing a climate change assessment and adaptive management plan for climate adaptation and management actions.

Outcomes (24 months)

6 months

- Outline of project schedule, capacity, and processes

- Workshops to establish target species and crucial habitats to address in Phase 1.
- Workshop to initiate development of methods for incorporating climate change into the connectivity landscapes defined as crucial habitat.
- Inventory and description of all applicable datasets, protocols, and QA/QC process
- Prioritized data layers and missing data
- Inventory of applicable models that can be applied to arid lands connectivity
- Inventory of proposed, planned, and implemented energy projects in arid lands

12 months

- Maps of categorized crucial habitats for selected species and/or ecological systems in the Columbia Plateau within the three states, to include a demonstration of cross-border crucial habitat mapping in subset of study area.
- Preliminary framework for DSS , budget and work plan necessary to complete DSS for three states
- A comprehensive plan for future analyses and identification of crucial connectivity landscapes among three states.
- A comprehensive plan for future rigorous, high-resolution analyses for incorporating climate change in the connectivity analysis
- ID necessary protocols and challenges for future merging of data

Constraints

- Contracting administration delays.
- Personnel hiring delays.
- Ability to acquire additional funding to support WGA pilot funding in Phase 1 and 2.
- Timeliness in involving and incorporating input of field biologist expertise and knowledge.
- Phase 2 funding and contracting delays interrupting ongoing work.

Assumptions

- No additional and significant hardware or software costs.
- Additional funding support from non-WGA sources.
- Growing and continuing investment of organizations.
- Public and political support for DSS efforts.

Contracting

Each state will contract directly to WGA for its Phase 1 funding

Reporting

All reporting will be done via Western Governor's Wildlife Council and DSS subgroup.

Budgeting –spreadsheet

Attached



Project Title: Idaho –Montana Divide

Project Objective: Pilot the conceptualization and coordination of a transboundary Decision Support System(DSS) for fish, wildlife, and habitats along the Idaho - Montana Divide. The pilot will focus on shrub-steppe, high desert, and coniferous forest ecosystems and associated fish, wildlife, and plant species in Bailey’s Ecoregional Sections of the Beaverhead Mountains, Idaho Batholith, Bitterroot Mountains, and Flathead Valley sections (Figure 1).

Project Primary Contact: Gregg Servheen, Idaho Department of Fish and Game, PO Box 25 Boise, ID 83707 208-287-2713, gregg.servheen@idfg.idaho.gov

Secondary State Contacts: Janet Hess-Herbert, Montana Fish, Wildlife and Parks, PO Box 200701 Helena, MT 59620, 406-444-7722 jhessherbert@mt.gov

Project Description: Each state will initiate the project by doing respective data inventories of all species and habitats, including scale, attributes and valuation. Existing GIS layers in each state that represent other geographic features (streams, elevation, land cover,etc.) will also be inventoried including scale, legend and currency. Differences in projection and scale will be addressed.

Phase 1

Phase 1 will focus on the Beaverhead Mountains section (described above). Scale, data categories, definitions and data availability will be considered when selecting a subset of fish, wildlife, and plant species associated with the focus ecosystems. The subset of selected species will include Yellowstone and Westslope Cutthroat trout, at least 1 terrestrial game species from each major species group (ungulates, upland game birds, and forest carnivores), and a group of habitat obligates of Species of Greatest Conservation Need as identified in our respective Comprehensive Wildlife Strategies. A layer identifying unfragmented landscapes and protected habitats will be created based upon agreed upon data definitions and terms. A species richness layer using Land Cover and species associations will also be explored.

Connectivity: Connectivity has recently been recognized as a higher priority due to fragmentation and climate change. Connectivity also offers one of the greatest opportunities to conserve some of the last remaining megafauna in the Rocky Mt. west. Fortunately, there has already been significant and good research on some specific species and in relation to concerns such as transportation. FWP believes that the objective of a connectivity layer is not to favor one or more of these species but adhere to a comprehensive approach that will attempt to include existing information from all sources (NGO and agency) and to include as many stakeholders as possible. The quality of the final product, however, will depend on the cooperation of all groups that have connectivity efforts completed or in progress. Our process will be based on collaboration not consensus.

Phase 1 of the pilot will evaluate connectivity tools and models in cooperation with NatureServe and the Wildlife Conservation Society's ongoing efforts to formulate connectivity best management practices. The connectivity assessment will consider resilience, redundancy, species function, and suitability of habitats. Assessment tools, including Corridor Design, FunConn, and Circuitscape, will be evaluated for their relevance to our pilot project situation. A process, data layers, and assessment will be itemized for implementation in Phase 2.

A multi-state mapping service will be created that will provide the initial "proof of concept" for an Idaho/Montana DSS and serve as the basis of our final DSS.

Phase 2

The outcomes, processes, and lessons learned from Phase 1 will be used in Phase 2 of our project. Phase 2 will include incorporating the remainder of the species and habitats in the Beaverhead sections as well as all species and habitats in the Idaho Batholith, Bitterroot Mountains and Flathead Valley sections that overlap the divide between Idaho and Montana. Using the processes and lesson learned in Phase 1, we will address scale, categorization, and define all remaining species and habitat data within these sections. Using defined data layers we will assess and categorize information to formulate maps and assessments, up to and including management guidelines, connectivity, climate change, biodiversity, and conservation priorities. Data maps and associated information will be displayed and made available via the mapping service at the end of Phase 2.

Energy Nexus

Idaho and Montana's pilot will address energy nexus through gaining knowledge and understanding of the importance of fish, wildlife, and habitat values for several ongoing

projects including: Mountain States Intertie (MSTI), a 500 kV electric transmission line proposed by Northwestern Energy; Chinook, a 500 kV electric transmission line proposed by TransCanada; and Northern Lights (Celillo), a 500 kV electric transmission line undergoing a feasibility study by TransCanada.

DSS Advancement

This project will enhance DSS capacity by enabling existing data and information that is not currently incorporated into GIS and existing information systems to be adapted to such formats to increase best available science into the DSS and it will rectify existing data sets such that they form an edge matched layer that is transboundary to the Idaho-Montana Divide. Updated information will be incorporated into existing models and predictive tools to describe and map wildlife connectivity, linkage, human footprint, conservation priorities, and climate change.

The project will assist in adoption of standards for future data collection and QA/QC that are compatible between the cooperating states and lead, over time, to increasingly seamless fish and wildlife data presented in a spatial context suitable at a local, regional, and landscape levels. All outcomes will be incorporated into and assist with the updating of the Comprehensive Wildlife Conservation Strategies in Idaho and Montana and help insure they seamlessly join, especially where focal habitats and species are concerned.

The project will reach out to all potential sources of fish, wildlife, and plant data and information relevant to the Idaho-Montana Divide project. These will include agencies, universities, Stream Net, research projects, Natural Heritage Programs, NGO's and others who may have or are developing and storing fish and wildlife data and information relevant to this project.

Federal Agency Coordination

All relevant federal agencies will be contacted at the initiation of the project and be requested to fully participate in terms of expertise, data and information, and comments to formulate the DSS for purposes of their use and incorporation of their data. This list will include: the U.S. Forest Service, Bureau of Land Management, Natural Resources Conservation Service, Montana state departments (Transportation, Environmental Quality and Natural Resources) Idaho state departments (Lands, Water Resources, Transportation, Office of Species Conservation, and Environmental Quality).

Stakeholder Involvement

All relevant stakeholders within the pilot area will be contacted at the initiation of the project and be requested to fully participate in terms of expertise, data and information, and

comments to formulate the DSS. This list will include but not be limited to: Yellowstone to Yukon Conservation Initiative, Spine of the Continent Initiative, Wildlife Conservation Society, The Nature Conservancy, American Wildlands, and universities.

We will hold at least 2 stakeholder meetings within the landscape we are focusing on for Phase 1. We expect those communities to be Island Park and Dillon with potential to expand to additional meetings in Salmon and Wisdom. We will also convene a technical advisory committee (TAC) consisting of NGO's, Tribes, universities, and others who have technical knowledge, expertise and investment in the area. We will contact and invite participation of all federal and state land management agencies, fish and wildlife managers, environmental managers (EPA, DEQ, DNR). In addition, we will ask each partner to incorporate information about the project on their respective web sites and provide opportunities for public input and involvement via their web sites.

Climate Change

We will incorporate information on the potential impacts of climate change using the best available science related to its effect on and needs for resilience, connectivity, and redundancy in landscapes, habitats, and species functions. Phase 1 climate change steps will include: 1) engaging partners and coordinating across state and regional boundaries; 2) clearly defining goals and objectives in the context of current and future climate conditions; and 3) selection of appropriate spatial and temporal scales for assessing wildlife adaptation needs. Our climate change data development and mapping will be done in coordination with ongoing climate change projects at the University of Washington and the University of Idaho and a Montana Climate Change Working Group. Outputs of these projects, such as vulnerability assessments, as well as their consultation will be used to form our climate change plan in Phase 1 and implement our climate change layers, mapping, and assessments in Phase 2.

Deliverables (for Phase 1)

- Complete inventory of GIS data layers for all reference layers and fish, wildlife, and plant data as available along the MT-ID divide.
- Transboundary compatible subset of focal species and land cover types for the Beaverhead Mountains Bailey's sections extending from Yellowstone National Park along the ID-MT Divide to Lost Trail Pass.
- A completed data layer defining unfragmented habitats for the focal area.
- Completed connectivity/linkage plan identifying steps, tools, and outcomes for producing a connectivity data layer for the entire ID-MT divide project area.

- Completed climate change plan outlining steps, data, vulnerability assessments, and outcomes for producing a climate change assessment and adaptive management plan for climate adaptation and management actions.

Outcomes (24 months)

- Transboundary compatible datasets for all SGCN and socially and commercially important species and habitats.
- Transboundary categorization of crucial habitat areas, including wildlife corridors, common habitats, habitats of unknown significance.
- A list of agreed upon definitions, data protocols, scales, and ranking models associated with transboundary data layers and assessments.
- An initial draft list of best practices and management recommendations for avoiding, minimizing, and mitigating impacts to wildlife corridors and crucial habitats.
- Spatial representations of climate change impacts and recommended management actions for reducing and adapting to climate change for wildlife benefit.
- A list of public comments and input on pilot project efforts.
- The mapping service available through the Montana and Idaho departments web sites for use by public.
- A list of recommendations and input from the Technical Advisory Committee (TAC).

Constraints

- Contracting administration delays.
- Personnel hiring delays.
- Ability to acquire additional funding to support WGA pilot funding in Phase 1 and 2.
- Timeliness in involving and incorporating input of field biologist expertise and knowledge.
- Phase 2 funding and contracting delays interrupting ongoing work.

Assumptions

No additional and significant hardware or software costs.

Additional funding support from non-WGA sources.

Growing and continuing investment of organization.

Public and political support for DSS efforts.

Contracting

Each state will contract directly to WGA for its Phase 1 funding. This pilot will include one project with 2 contracts.

Reporting

All reporting will be done via Western Governor's Wildlife Council and DSS subgroup.

Budgeting - spreadsheet

Attached

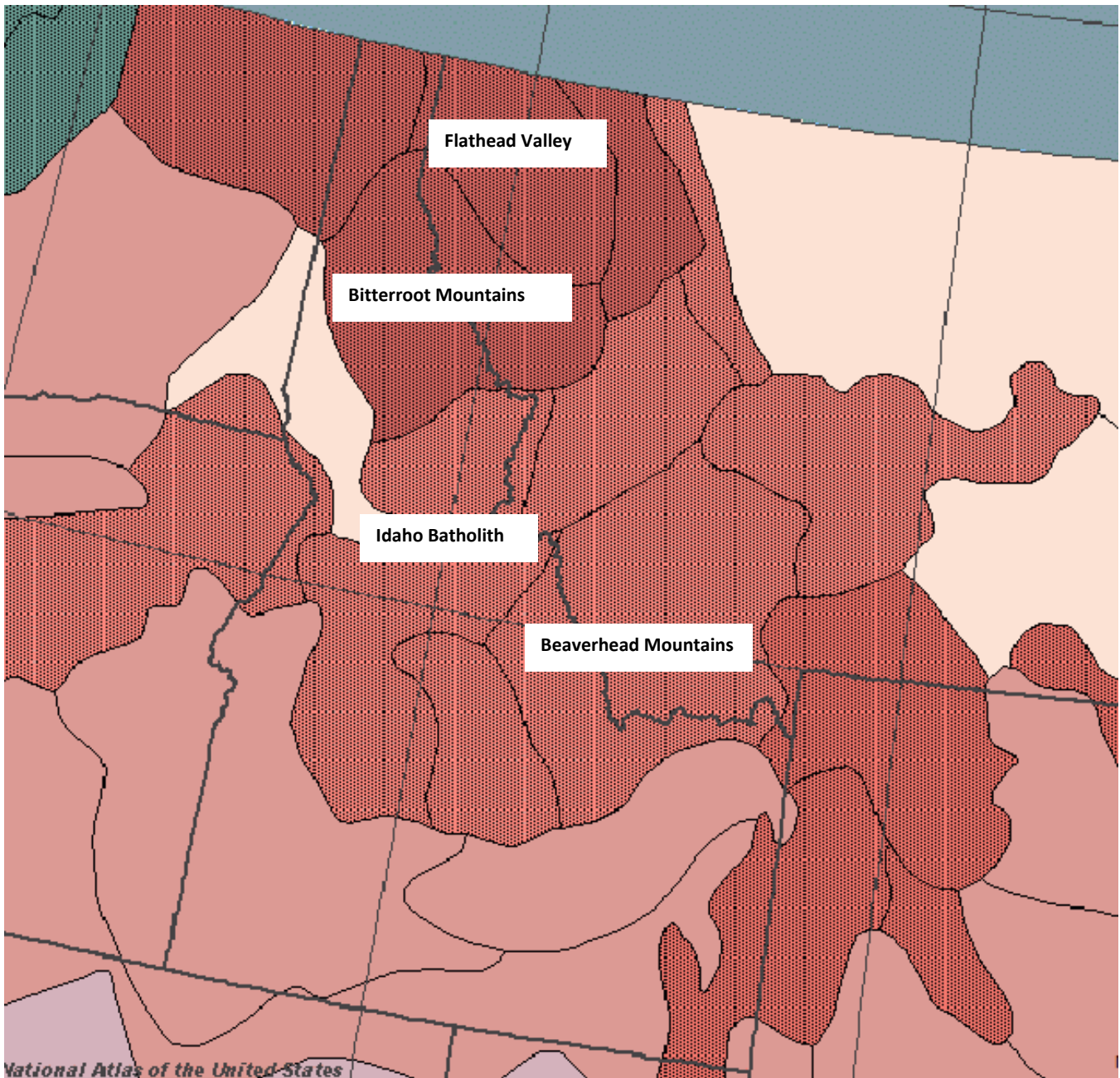


Figure 1. Four Bailey's ecoregional sections comprising the pilot study area for Phase 1 and 2 of the Montana-Idaho Divide Project.

**Western Governors' Wildlife Council
Pilot Project Statement of Work
Submitted by Bill Van Pelt, WAFWA Grassland Coordinator
On behalf of the states Oklahoma and Kansas**

Pilot Title: Spatial modeling tool for identifying and prioritizing lesser prairie chicken habitat

Project Objective: According to *The state of the birds, United States of America 2009*, a report distributed by the North American Bird Conservation Initiative, populations of grassland birds are among the fastest and most consistently declining cohort of birds in North America. Factors contributing to these population declines include conversion of grasslands to agriculture, agricultural management practices, invasion of woody species (e.g. eastern red cedar and mesquite), and energy development. The lesser prairie chicken (LPC) is one of 42 grassland species with sufficient monitoring data to conclude the range-wide population is declining significantly, which has resulted in the species identified by the USFWS as a candidate for listing under the Endangered Species Act.

Recently, various GIS efforts have been initiated to identify suitable LPC habitat, and assess risk of habitat loss in relation to various threats such as wind energy development and agriculture. Information used in these efforts has included 1) Landuse/landcover, 2) core habitats, 3) buffer habitats, 4) managed lands and their buffers, 5) buffers for leks, 6) current range, 7) historical range, and 8) area outside avoidance buffers. Other data layers may be identified by the cooperators during the pilot development.

Combining these efforts into a single consolidated approach would allow managers to build a rangewide DSS tool for LPC using information based upon population size and location, habitat, and expert opinion. This DSS could be used to identify areas important for LPC conservation can be identified as well as connecting corridors for population maintenance. In addition, participants can explore the possibility of expanding the model to include other grassland species associated with LPC.

State Contacts: Bill Van Pelt, WAFWA Grassland Coordinator, AZ Game and Fish Department, 5000 West Carefree Highway, Phoenix, Arizona 85086, bvanpelt@azgfd.gov, 623-236-7573.

Richard Hatcher, Director, Oklahoma Department of Wildlife Conservation, 1801 North Lincoln, Post Office Box 53465, Oklahoma City, Oklahoma, 73105, 405-521-4660, rhatcher@odwc.state.ok.us.

Keith Sexson, Assistant Secretary of Operations, Kansas Department of Wildlife and Parks, 512 SE 25th Ave. Pratt, KS 67124620-670-0701, keith.sexson@ksoutdoors.com.

Secondary State Partners: Texas, Colorado, and New Mexico

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Tom Remington, Director, Colorado Division of Wildlife, 6060 Broadway, Denver, Colorado, 80216, 303-291-7208, tom.remington@state.co.us.

Tod Stevenson, Director, New Mexico Department of Game and Fish, Post Office Box 25112, Santa fe, New Mexico, 87504, (505) 476-8008, t.stevenson@state.nm.us.

Project Description

Energy Nexus: Included in the model would be information on possible renewable energy resources such as wind, transmission corridors, habitat corridors, and mitigation areas.

DSS advancement: The pilot will bring together key parties across multiple jurisdictions in an attempt to develop a cohesive approach to conservation design for LPC and is based upon the best available data, which will include information on potential energy development. The pilot will begin to identify site-specific standards and a desired future condition of the grassland ecosystem across the range of the LPC.

Federal Agency Coordination: This modeling effort is consistent with actions identified in the SWAP for the 5 states (CO, NM, OK, KS, and TX). The wildlife agencies involved in this effort would propose to partner with USFWS, BLM, USFS, USGS and NPS who are already partners in the WAFWA Grassland Initiative.

Stakeholder Involvement: State agencies within CO, NM, OK, KS, and TX, Joint Ventures, The Nature Conservancy and other NGOs, and other interested parties.

Connectivity: Through the development of a DSS we will be able to identify fragmentation using a combination of geospatial data, including information on roads, urban areas, and land use/land-cover variables. Areas of potential connectivity will be discerned using species habitat preferences, limitations to dispersal, and areas of potential habitat and corridors for population establishment and maintenance. This type of analysis will readily enable identification of key corridors and habitat blocks within various states and across the greater 5-state area as a whole. Additionally, we will be able to assess the ratio of habitat available on public and private lands and determine how well protected each species is and whether additional public/private partnerships need to be established to promote species conservation.

Climate Change: We explore combining species occurrence information (specific sightings data) with environmental data (such as temperature, precipitation, and elevation) to construct ecological requirements of a species and predict its geographic and ecological potential providing testable hypotheses of distribution potential on the landscape.

Deliverables:

Months 1-3 Assemble potential partners to discuss the advantages and disadvantages of different modeling techniques and select a subset of potentially suitable modeling approaches for which sufficient data is reasonably expected to be available.

Months 4-8 Assess and gather available information on potential modeling factors on landuse/landcover, current and historical range of the species, biological features, roadways etc. and hold workshop to include stakeholders for the possible post-pilot phase along with those from Nebraska and the Dakotas in order to ensure the greatest degree of transferability of the products and outcomes of the workshop to the broader grassland landscape.

Months 9-11 Assemble information into usable formats necessary for modeling and identify gaps in information. Enter datasets into modeling program and run initial version of the model.

Months 12-17 Review draft information with potential partners, modify modeling information to reflect expert opinion and on-the-ground information. Explain modeling inputs and outputs, datasets, and mapping.

Months 18-24 Produce final versions of the model and have them reviewed by cooperators. Finalize and submit report with all data used both in paper and electronic version.

Outcomes: The intent of the modeling effort would be to mitigate impacts to grassland dependent species and their associated habitats by providing current and predictive information through a decision support system.

Constraints: State procurement rules may be a challenge to implement a regional project. However, we believe we can address those issues through state vendors, contracting sources, etc.

Assumptions: We suggest that this methodology will be useful for evaluating alternative energy sites (e.g. wind farms or solar panel arrays). It is also of note some of the species we suggest modeling are not only endangered but also serve as keystone species. By focusing on these umbrella species like the LPC we are protecting many more grassland bird species and their habitat. In this way, combining spatially-explicit species' distributions with energy site planning will allow for improved risk assessment and or mitigation planning of future alternative energy sites.

Contracting: It was decided by the steering committee to pool the award from this grant. While Kansas will be the primary state for contracting this grant, portions of the grant will need go to each state within the range of the LPC for travel and it would be easier for the states if WGA could set up agreements with the states for this portion of the grant.

Reporting: Council members will verbally report regularly to the progress of their pilots meetings and other WGA-sponsored events.

Budget: \$200,000. Personnel/contract \$ 160,000 (GIS analyst/contractor, WAFWA coordinator, pre agreement costs etc.), \$20,000 travel (stipend for states, project personnel), \$5,000 meetings/workshops, and \$15,000 (In-direct costs).

Western Governors' Wildlife Council
Pilot Project Statement of Work
Submitted by Bill Van Pelt, WAFWA Grassland Coordinator
On behalf of the states Nebraska, North Dakota, and South Dakota

Pilot Title: Ecological niche modeling to identify and prioritize important grassland habitats in the northern Great Plains

Project Objective: We propose to use ecological niche modeling to predict the distribution and blocks of habitat for a suite of grassland species within the states of Nebraska, North Dakota, and South Dakota. The species under consideration will be determined from the lists of the Species of Greater Conservation Needs by the 3 states developing the pilot. Ecological niche models combine environmental data (such as temperature, precipitation, vegetation, etc.) with species occurrence information (specific sightings data) to construct ecological requirements of a species and predict its geographic and ecological potential providing testable hypotheses of distribution potential on the landscape. We will then incorporate GIS layers for Wind Resource Areas and transmission lines from the National Renewable Energy Lab to identify wildlife concentration areas in relation to energy development plans. We suggest that this methodology will be useful for evaluating potential energy sites (e.g. wind farms or solar panel arrays). In this way, combining spatially-explicit species' distribution models with energy site planning will allow for improved risk assessment and or mitigation planning of future energy sites. Using ecological components, the tool will allow the states to incorporate information to allow for climatic changes to be incorporated into the model to predict possible shifts in a species range.

State Contacts: Bill Van Pelt, WAFWA Grassland Coordinator, AZ Game and Fish Department, 5000 West Carefree Highway, Phoenix, Arizona 85086, bvanpelt@azgfd.gov, 623-236-7573.

Tom Kirschenmann, SD Game, Fish, and Parks, Division of Wildlife, Chief of Terrestrial Resources 523 E. Capitol, Pierre, SD 57501, 605-773-4192, tom.kirschenmann@state.sd.us.

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Steve Dyke, Conservation Supervisor, North Dakota Game and Fish Department 100 N. Bismarck Expressway Bismarck, ND 58501-5095, 701-328-6347, sdyke@nd.gov.

Secondary State Partners: Dave Dingman, Nebraska Energy Office, 402.471.3362, dave.dingman@nebraska.gov.

Project Description

Energy Nexus: Included in the model would be information on possible renewable energy resources, transmission corridors, and mitigation areas.

DSS advancement: The pilot will bring together key parties across multi-jurisdictions with data related to the grassland habitats and the various impacts to grassland species from energy development, and will identify future management needs. The pilot will begin to identify among these different states site-specific standards and a desired future condition for the grassland ecosystem. This

will provide a single data set that represents the greater 3-state area and will allow for state-by-state modeling subsets in the future.

Federal Agency Coordination: This modeling effort is consistent with actions identified in the SWAP for the states of Nebraska, North Dakota, and South Dakota. The wildlife agencies involved in this effort would propose to partner with USFWS, BLM, USFS, and NPS who are already partners in the WAFWA Grassland Initiative.

Stakeholder Involvement: State agencies within Nebraska, North Dakota, and South Dakota, Joint Ventures, The Nature Conservancy and other NGOs, and other interested parties.

Connectivity: Niche model predictions will be refined by eliminating portions of the predicted geography using a combination of roads, urban areas, and land use/land-cover variables that describe and species habitat preferences and limitation to dispersal or population establishment to develop a spatial distribution across what we consider the species' current available habitat. These final distribution maps will readily enable identification of key corridors and habitat blocks within various states and across the greater 3-state area as a whole. Additionally, we will be able to assess the ratio of habitat available on public and private lands and determine how well protected each species is and whether additional public/private partnerships need to be established to ensure species conservation needs are met.

Predictive Distribution Modeling: Ecological niche models offer an opportunity to predict and assess habitat for a wide range of species over broad geographical areas without large expenditures. Ecological niche models combine species occurrence information (specific sightings data) with environmental data (such as temperature, precipitation, and elevation) to construct ecological requirements of a species and predict its geographic and ecological potential providing testable hypotheses of distribution potential on the landscape. A set of environmental coverages will be constructed from publicly available, satellite-derived and/or interpolated ground data representing a suite of biologically important variables that are well established in the literature. This will provide a single data set that represents the greater 3-state area and will also allow for state-by-state modeling subsets. These models work by defining non-random relationships between species' locality data and environmental variables and then apply those relationships to the landscape within a GIS. This produces a presence/absence map that represents a potential geographic distribution for the species on the landscape with a measure of confidence in the accuracy of the prediction. These are ideal maps for determining the geographic distribution of a species, as well as determining possible areas where rare or more difficult to find species may occupy habitat.

Climate Change: Climate envelope models will be run, under different predicted future climate scenarios, to evaluate potential species' range shifts. Results of these analyses will be used to identify potential corridors that may be important to allow species to shift their ranges in response to climate change.

Deliverables:

Months 1-6 Assess and gather available information on potential modeling factors including landuse/landcover, environmental parameters, current and historical range of the species, biological features, roadways etc. Hold a workshop to include stakeholders for the possible post-pilot phase along with those from Nebraska and the Dakotas in order to ensure the greatest degree of transferability of the products and outcomes of the workshop to the broader grassland landscape.

Months 7-9 Assemble information into usable formats necessary for modeling and identify gaps in information. Enter datasets into modeling program and run initial version of the model.

Months 9-15 Review draft information with potential partners, modify modeling information to reflect expert opinion and on-the-ground information. Explain modeling inputs and outputs, datasets, and mapping.

Months 15-24 Produce final versions of the models and have them reviewed by cooperators. Finalize and submit report with all data used both in paper and electronic version.

Outcomes: The intent of the modeling effort would be to mitigate impacts to grassland dependent species and their associated habitats by providing current and predictive information through a decision support system.

Constraints: State procurement rules may be a challenge to implement a regional project. However, we believe we can address those issues through state vendors, contracting sources, etc.

Assumptions: We suggest that this methodology will be useful for evaluating alternative energy sites (e.g. wind farms or solar panel arrays). It is also of note that some of the species we suggest modeling are not only endangered but also serve as keystone species. In this way, combining spatially-explicit species' distributions with energy site planning will allow for improved risk assessment and or mitigation planning of future alternative energy sites.

Contracting: It was decided by the steering committee to pool the award from this grant. While South Dakota will be the primary state for contracting this grant, portions of the grant will need go to each state for travel and it would be easier for the states if WGA could set up agreements with the states for this portion of the grant.

Reporting: Council members will verbally report regularly on the progress of their pilot meetings and other WGA-sponsored events.

Budget: \$300,000. Personnel/contract \$ 162,000 (GIS analyst/contractor, WAFWA coordinator, pre agreement costs etc.), \$18,000 travel (stipend for states, project personnel), \$5,000 meetings/workshops, \$100,000 for data collection in pilot area to test model, and \$15,000 (In-direct costs).

Pilot Project Statement of Work
Crucial Wildlife Habitats and Corridors Decision Support System
for the Colorado-New Mexico Border Region

Pilot Title: Crucial Wildlife Habitats and Corridors Decision Support System for the Colorado-New Mexico Border Region.

Project Objective: The region along the shared Colorado-New Mexico border, the focal area of this decision support system pilot project, has been identified by both states in their respective wildlife actions plans as having a high degree of both ecological and biological diversity. Both states' respective wildlife action plans identify key terrestrial habitats within these ecoregions warranting protection from further fragmentation and loss. Many important key aquatic habitats within this border region have also been identified. A high degree of species diversity is associated with the habitat diversity of this region, including a number of species of greatest conservation need (SGCN). Important elevational and latitudinal big game migration corridors, primarily for mule deer and elk, occur throughout the area and link both partner states ecologically. An abundance of mule deer, elk, pronghorn antelope, black bear and turkey provide for high quality hunting opportunities, and high-quality fishing and other wildlife-associated recreation opportunities make this region a high priority for habitat protection for both states due in large part to the significant economic benefit realized by the local communities. This region is also highly valued for its aesthetic natural beauty as evidenced by the increasing rate of development for summer and retirement homes. The area is also known for its wealth of both developed and potential renewable and non-renewable energy.

The Colorado Division of Wildlife and New Mexico Department of Game and Fish (Partners) will 1) standardize interpretations of "crucial habitat and important wildlife corridors" definitions based on Partner's respective existing wildlife distribution and migration corridor data; 2) jointly identify and prioritize crucial habitat and important wildlife corridors in the Colorado-New Mexico border region based on these interpretations for a suite of wildlife species, including, but not limited to "elk, deer, pronghorn antelope and bighorn sheep, and as identified by the two states, other key species of wildlife that migrate across the shared border..." (as directed by the December 2009 Colorado and New Mexico Governors' Memorandum of Understanding); 3) identify data gaps and fill those gaps to the extent that resources to do so are available and when such information will contribute to the project objectives; 4) evaluate threats to crucial habitat and important wildlife corridors from future renewable and non-renewable energy development and transmission, transportation, climate change and other threats as determined; 5) integrate other partners such as federal agencies, Jicarilla Apache, Southern Ute and Ute Mountain Tribes, local governments, non-governmental organizations, and interested members of the public; 6) identify desired future conditions for crucial wildlife habitat and important corridors; 7) identify areas where energy development and transmission corridors can be sited to avoid impacting

crucial habitats and corridors; 8) evaluate climate change-related threats guide the development of strategies to aid the management of crucial wildlife habitat and important migration corridors shared by New Mexico and Colorado. Ultimately, the pilot will lead to the development of a web-based, spatially-explicit decision support system presenting information at a scale supported by the available data, to be used to identify crucial wildlife habitats and important wildlife corridors and inform management decisions that have the potential to impact those habitats and corridors.

State Contacts:

Primary Pilot Project Contact: (to be named by the Colorado Division of Wildlife)

Secondary Contacts:

New Mexico Terra Manasco, Assistant Chief
Conservation Services Division
New Mexico Department of Game and Fish
P.O. Box 25112
Santa Fe, New Mexico 87507
505-476-8114
terra.manasco@state.nm.us

Colorado Jeffrey M. Ver Steeg (interim contact)
Assistant Director, Wildlife Programs
Colorado Division of Wildlife
6060 Broadway, Denver CO 80216
303.291.7204 jeff.ver_steeg@state.co.us

Secondary State Partners: None.

Project Description:

Energy Nexus: The Colorado-New Mexico border region has historically experienced, and continues to experience at an increasing rate, effects to wildlife, crucial habitats and important wildlife corridors from non-renewable energy development (i.e., oil, natural gas and coal-bed methane). Within these heavily industrialized areas, rates of habitat fragmentation, habitat loss and disturbance are high due to the density of well pads, pipelines, access roads and associated traffic. Non-renewable energy development activity has been increasing in the Colorado-New Mexico border region in recent years due to increased prices for fossil fuels. Well densities (and associated road densities) within the San Juan Basin (both sides of the border) have increased with the upsurge in exploration and production. An important emerging challenge to managing crucial wildlife habitat and important wildlife corridors is the anticipated development of renewable wind and solar

energy facilities within the Colorado-New Mexico border region, particularly in the Alamosa Valley and northeastern New Mexico and south-eastern Colorado, where wind and solar potential are high. The placement of new transmission corridors for both renewable and non-renewable energy could further fragment crucial wildlife habitat and important wildlife corridors within the Colorado-New Mexico border region.

Other challenges to crucial wildlife habitats and important wildlife corridors include the expansion of sub-divisions and ranchettes, transportation issues (i.e., barrier effect from existing highways and highway improvements such as wall barriers, and increasing frequencies of wildlife- vehicle collisions as a result of increased traffic volumes), increasing off-road vehicle use and other forms of recreation, and climate change. The development of the Colorado-New Mexico Border Region Decision Support System will allow the Colorado Division of Wildlife and New Mexico Department of Game and Fish, partner federal agencies, tribes, NGOs, energy and land development advocates, counties, and the general public to make informed recommendations and decisions regarding the future placement of these developments to protect crucial wildlife habitats and important corridors from additional habitat fragmentation and loss.

DSS Advancement: The Colorado-New Mexico Border Region Decision Support System development process will follow the three steps outlined in the 10 February 2010 draft of the Western Governors' Wildlife Council white paper *Western Regional Wildlife Decision Support System: Definitions and Guidance for State Systems*. The Partners will compile Tier 1 data, including 1) distribution data for species of economic and recreational importance and Species of Greatest Conservation Need (SGCN), as identified in each state's respective wildlife action plan; 2) focal species reproduction areas, winter concentration areas and other important seasonal habitats; 3) migratory and dispersal corridors for focal species, including riparian and lotic aquatic habitats; and 4) key tracts of relatively unfragmented habitats; and Tier 2 data, including but not necessarily limited to lands with high wildlife/biodiversity conservation values identified in ecoregional assessments conducted by conservation organizations such as The Nature Conservancy. An equally important effort will be made to incorporate into the DSS geo-spatial data identifying ongoing non-renewable and renewable energy development and transmission activities, roads and highways, areas of expanding housing and recreational development, and to the extent possible, model future development scenarios for renewable and non-renewable energy development and transmission, housing and recreational development, and other threats as appropriate (e.g., climate change). Step 2 will include ranking and prioritization of these data to determine crucial wildlife habitats and important wildlife corridors, and assign a threat ranking based on an overlay of ongoing and proposed future energy, transmission, and other development. As part of Step 2, desired future condition of areas identified as crucial wildlife habitats and important wildlife

corridors will be determined. Appropriate federal agencies and interested members of the public will be invited to participate during this process. The final DSS geographical information system product will be web-based to enable multiple jurisdictions making land-use decisions to plan and evaluate activities to minimize negative impacts to crucial wildlife habitats and important wildlife corridors. Cooperation and coordination with federal agencies and interested publics, process transparency, and compatibility of the DSS regionally will be emphasized throughout the 2-year process. The final Colorado-New Mexico Border Region DSS product will facilitate the development of respective state-wide DSS products for Colorado and New Mexico as requested by the Western Governors' Association.

Federal Agency Coordination: Colorado-New Mexico pilot project Partners have conducted two preliminary meetings for planning future DSS development. Rio Grande National Forest (Colorado) staff attended the second meeting. Partners anticipate conducting a series of meetings with federal agencies, including, but not necessarily limited to Rio Grande and Carson National Forests, Colorado and New Mexico field offices of the Bureau of Land Management, U.S. Fish and Wildlife Service, and the Natural Resources Conservation Service. Other potential federal agencies involved include the National Park Service and Bureau of Indian Affairs.

Stakeholder Involvement: Colorado-New Mexico pilot project Partners anticipate conducting a series of meeting to invite stakeholders, including Jicarilla Apache, Southern Ute and Mountain Ute Tribes, local jurisdictions and potentially interested state agencies, non-governmental organizations and interested industry groups, and interested private landowners and other members of the public, to participate in the process of identifying crucial wildlife habitats and important wildlife corridors. Levels of involvement by interested stakeholders will likely be varied, but efforts will be made to accommodate any level of involvement desired, and communication with stakeholders throughout the process will be maintained by email list-servs and websites updates to ensure that all participants ultimately are empowered to use the DSS for land-use planning and decision-making. Emphasis by the Partners will be placed on transparency and inclusiveness, using a consensus-building process to identify key areas recommended for protection of crucial wildlife habitats and corridors.

Connectivity: Maintaining habitat connectivity and minimizing additional habitat fragmentation of identified crucial wildlife habitats and important wildlife corridors within the Colorado-New Mexico border region is a primary goal of the development of this DSS. Colorado has, through a partnership of NGOs, academia and state agencies, developed a statewide linkage assessment using GIS to analyze wildlife habitat permeability for a suite of species relative to topography and barriers such as highways. As this Pilot Project proceeds,

consideration will be given to the need to conduct a similar analysis for the Colorado-New Mexico border region. Other contributors/partners who have expertise and relevant information to bring to the project will be sought.

Will the Pilot address multiple species? Based on 2 initial meetings between Partners, elk, mule deer, Rocky Mountain bighorn sheep and pronghorn antelope have been identified as focal species. Other species being considered for inclusion include Rio Grande cutthroat trout, other endemic fish species and at-risk migratory avian species. Other SGCN and game species will likely be included to the extent that data are available. There are 22 Tier 1 and 9 Tier 2 SGCN common to the New Mexico-Colorado state border.

Do any partner states plan to integrate pilot work with any state SWAPs or otherwise address a problem that can be generalized for SWAP application? Both Partner state SWAPs address the need to protect habitat connectivity and minimize habitat fragmentation through protection and restoration of important wildlife habitat and corridors, particularly on public lands. Development of the Colorado-New Mexico Border Region DSS will create the opportunity for enhanced protection of habitat connectivity and mitigate for additional habitat fragmentation within identified crucial wildlife habitat and important corridors along the Colorado-New Mexico border region, and will facilitate the development of respective state-wide DSSs for Colorado and New Mexico. Also, continued funding of State Wildlife Grants requires that state wildlife agencies, through their individual SWAPs, commit to monitoring conservation activities across key habitats identified in each SWAP. In implementing the State Wildlife and Tribal Grants Act, Congress identified 8 elements that state wildlife agencies are required to implement to continue to receive funding through the State Wildlife Grants Program. Element 5 directs state wildlife agencies to develop monitoring plans for SGCN and key habitats that will determine the effectiveness of conservation actions (e.g., habitat restoration), and to develop tools to assist in adapting monitoring programs and conservation actions to respond appropriately to new information or changing conditions. Development of the Colorado-New Mexico Border Region DSS and subsequent respective state-wide DSSs will clearly be a major step toward meeting these goals as outlined in the respective Partner state SWAPs.

Would states require or desire additional support for connectivity integration in the project (e.g., expert consulting/advising, technical assistance such as GIS modeling, technical assistance in use of specific tools (e.g., Circuitscape), climate change expertise, etc.? Yes.

Would states require additional funding directly to your project to add/enhance a connectivity component, and if so, approximately how much? The partners anticipate building a connectivity feature during the later stages of the project. Funding requirements for this purpose will become clearer after the base system is developed, however, additional funding may be necessary to fully integrate a connectivity component.

Would you be interested and willing to work with the team assembled by NaturServ for their connectivity initiative? This would involve acting as a test bed for certain approaches and recommendations and providing feedback during your project that could contribute to development of best practices for integrating connectivity into SWAPs.
Yes.

Climate Change: Focal species that will be analyzed during the development of the Colorado-New Mexico Border Region DSS have elevational and latitudinal components of migration, including north-south movements across the interstate border. By protecting crucial wildlife habitats and important wildlife corridors that facilitate north-south movement of focal species from additional habitat fragmentation and loss, these key habitats will be available to accommodate northward (and elevational) movement of species distributions as a result of predicted changing climatic regimes.

Deliverables: In addition to the final pilot assessment report due to the WGA at the end of the 24-month period, and the referenced updated DSS work plan, which will be emphasized once final pilot project approval is received, the Colorado-New Mexico Border Region Partners anticipate having a web-based tool available to stakeholders for land management planning and decision-making by the end of the 2-year period.

Outcomes: Colorado-New Mexico Border Region Partners anticipate, at the end of the 2-year pilot project, to have an easily accessible and readily useable (by stakeholders), geo-spatially accurate and scale-appropriate web-based decision support system tool for land management and energy development planning that will enhance the ability to maintain crucial habitats and important wildlife corridors and minimize further habitat fragmentation. The process conducted by the Partners to develop this DSS will have included many federal and state agencies, Tribal interests, private landowners, non-governmental organizations, industry interests and members of the public in an open and transparent consensus-building process to identify crucial wildlife habitats and important corridors across the Colorado-New Mexico border region. This process will create a template for Colorado and New Mexico to develop respective individual state-wide decision support systems as anticipated by the Western Governors' Association Wildlife Corridor Initiative.

Constraints: None identified to begin developing the DSS and stakeholder involvement process. Additional funding for technical assistance may be needed as the process progresses and limitations of Partners staffing and capacities are identified.

Assumptions: None identified.

Contracting: Colorado Division of Wildlife will be the contracting entity.

Reporting: The Partners will comply with DOE's ARRA reporting requirements. Further, the Partners will provide reports, verbal or written, as requested by the WGA.

Budget: The Partners anticipate contributing significant human and fiscal resources to the project. Salaries, benefits and other associated administrative costs will be absorbed by the Partners. Additionally, the Partners have already invested substantial time and money into planning and developing data inputs for the project.

For additional budget detail, see attached.

Pilot Title: Wyoming Interagency Spatial Database & Online Management Tools for Wildlife

Project Objective:

The overall objective of this pilot study is to develop a standard protocol and methodology for creating, storing, maintaining and disseminating environmental and wildlife data for a collection of data providers while at the same time making available the most current and accurate spatial representations to a wide network of users in an efficient and timely manner. Two key products will be produced to meet this overarching goal: a centralized and highly controlled spatial database environment for housing these data and an Internet-based mapping application providing access to these data. While development of both tasks is technologically straight forward, the success of such an effort will be more dependent on the effectiveness of getting key stakeholder involvement and contribution throughout the process and then maintaining these collaborations long term to insure the maintenance and use of these data in responsible planning and development of not only energy-related projects, but any potential land use decision throughout Wyoming.

State Contacts:

- *Overall Pilot Project Contact* - Kirk Nordyke, GIS Coordinator, Wyoming Game & Fish Department
- *Inter-agency Coordination* - Mary Flanderka, Habitat Protection Coordinator, Office of the Director, Wyoming Game & Fish Department
- *Contractor/Technical Lead* - Jim Oakleaf, Technical Services Coordinator, Wyoming Geographic Information Science Center, University of Wyoming

Secondary State Partners:

Wyoming Game & Fish Department (WGFD) is actively seeking input and interest from the Wyoming Department of Transportation (DOT), Wyoming Office of State Land and Investments (OSLI), Wyoming Department of Environmental Quality (DEQ), Wyoming Natural Diversity Database (WYNDD), Bureau of Land Management (BLM), US Forest Service – Medicine Bow National Forest (MBNF), Natural Resources Conservation Service (NRCS), and US Fish & Wildlife Service (USFWS). A final list of key partners will be made pending mutual evaluation of agency goals and philosophies with respect to sharing geospatial data cross-agency, cross-state, and with the public.

Project Description:

This project will employ a distributed spatial database model to maintain, manage, create and use key wildlife and resource data across Wyoming for decisions related to energy and other long term development activities. This spatial database will contain and provide access to all currently available and future developed Wyoming Tier 1 and Tier 2 data as identified by the WGWC's DSS guidance document. Protocols developed in the database will allow rapid development and maintenance of any ancillary data derived from these data. Database planning, population, maintenance and management will be performed directly by a Database Management Team comprised of key individuals assigned by partnering agencies (primary data providers) in Wyoming such as WGFD, WYNDD, USFWS, and BLM. All spatial data maintained by these groups will be replicated and stored within a centralized and secure spatial database hosted at Wyoming Geographic Information Science Center (WyGIS). Security, standards and generalization protocols will be developed within the database allowing cross agency and multi-state data sharing without jeopardizing the sensitivity of some of these datasets. Decision makers from other key partners such as NRCS, DOT, OS LI, and DEQ will have access to these data or generalized-

derivatives of them via a web-based decision support application. An Application Advisory Group made up of a variety of state, federal, non-profit and industry personnel (primary data users) will guide development of this application. The overall application design will be standard across agencies and will directly access the centralized and current resource database. By designing the application in a modular and an open-architectural method, future development could be accomplished to meet specific needs of any of these groups. In addition, WyGISC will provide the ability for any of these cooperating agencies or identified surrounding state agencies to link directly into the web mapping services, facilitating the development of their own internal decision support system. The overall direction and priorities of this effort will be managed by an Oversight Committee made up of key individuals invested in the success of this endeavor.

Energy Nexus: Wyoming provides a substantial role in meeting the demands of US energy consumption. According to the US Energy Information Administration, Wyoming is the largest coal producing state in the nation, one of the top natural gas-producing states in the nation, has over a dozen of the nation's largest oil and gas producing fields and is rapidly becoming one of the leading states in wind energy. Due mainly to being the least populated state, most of these resources are transported by truck, rail, transmission line and pipeline for distribution and use outside of Wyoming. A small percentage of these resources are currently used within Wyoming to produce electricity, with the State contributing only 1.4% to the total net US electricity consumption. While this percentage is currently low, Wyoming is second only to Arizona in the Rocky Mountain Region for total electricity generation with over four million megawatt-hours produced¹. This number will certainly increase with the eight currently proposed high-voltage transmission lines being studied to originate in Wyoming². The increase in energy transport capacity is occurring in response to development of more electricity-producing facilities in Wyoming, focusing on low or non-carbon producing technologies, such as clean coal and natural gas-fired power plants, and wind farms.

Regardless of the resource developed or type of energy produced, continued growth in the demand for energy will fuel further development and more efficient use and transportation of Wyoming's energy resources. This energy development will increase the amount of land disturbed leading to potential natural resource and wildlife conflicts. In order for companies to plan and mitigate potential conflicts it is necessary for them to have access to the most current and up-to-date information. Since many of these projects have very large footprints across Wyoming, the most advantageous and efficient method of portraying these data are through spatial representation, thus giving companies the ability to overlay development scenarios with environmental and wildlife concerns. Currently many companies are using geospatial technologies such as Geographic Information Systems (GIS), Remote Sensing (RS) and Global Positioning Systems (GPS) to facilitate responsible and environmentally-friendly development. One current limitation in Wyoming to using these technologies is the efficient access to the most current and accurate spatial data representing the State's environmental and wildlife concerns. The development of Wyoming's DSS will eliminate the need for developers and consultants to contact several different agencies and individuals for data and instead provide an efficient one-stop location for their data requests while at the same time giving them the reassurance that their analysis and planning efforts are using Wyoming's definitive data source. This in-turn will allow wildlife concerns and issues to be addressed in the planning process prior to potential conflicts arising from energy development.

¹ Energy Information Administration, State Energy Data System, http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=WY

² Wyoming Infrastructure Authority, <http://wyia.org/>

Additionally, by having access to an online mapping application depicting many of these spatial data, energy developers will have the ability to incorporate wildlife and environmental concerns directly in the conceptual and pre-planning stage of a proposal leading to even fewer issues through planned avoidance of crucial areas.

DSS Advancement: This effort, while Wyoming centric, will also benefit the DSS efforts ongoing at the WGA and the spatial scope for which this group is initiating discussions on Western US policies and decisions. Initially, just providing a standard and centralized repository of all available Tier 1 and 2 spatial data will insure decision makers are using the most up-to-date and accurate resource information concerning any development at both the local level and larger statewide level. Standards and protocols will be developed by the Database Management Team not only insuring both state and federal agency needs here in Wyoming are being met but also through the WGFD that the needs of surrounding states are addressed. This will assist in WGA's goal of providing a seamless wildlife/resource database and mapping protocol across the Western states.

The initial database development will rely on a broad network of identified partners who are creating, maintaining and updating any of the Tier 1 or 2 spatial data and/or any supplemental data critical to the referencing and use of these data. Partners already identified for the Database Management Team include personnel from the WGFD, WYNDD, Wyoming BLM, Wyoming USFWS and WyGIS. Additional groups representing industry and/or non-profits who are identified as producing important data will also be included and asked to participate in contributing to the development and maintenance of this database.

Security will be a key component for facilitating use and participation in the creation and maintenance of this centralized database. Maintaining the security needs of all contributors to the database, while also allowing necessary flow of spatial information to a much larger audience, will be a prerequisite. This will require the development of an approval mechanism for the release of data and/or procedures established to release generalized spatial data to the public to allow use of data without exact locations for sensitive data. It will be the mandate of the Database Management Team to create these protocols and/or standards.

In the development of an online mapping application, Wyoming will work with other WGA DSS efforts to ensure compatibility issues are met with other states. Additionally, due to this application disseminating spatial data to a wide audience of data users, a larger Application Advisory Group will help guide the development of this application. A modular and scalable solution is planned to help facilitate the customization of this application for a diverse user base. The overall goal of this application is to provide the most current and accurate environmental and wildlife spatial data for project planning and decision making.

Federal Agency Coordination: Efforts in Wyoming have already included several federal agencies in the discussion of developing a DSS. Prior to WGA identifying the need of individual state DSSs, Wyoming had initiated discussions among Wyoming USFWS, BLM and NRCS representatives focused on creating something similar to this idea. These agencies have verbally committed to some level of involvement with this effort either directly in data stewardship within the DSS or via participation in the Application Advisory Group and/or Database Management Team. Others such as the US Forest Service, the Bureau of Reclamation, Federal Highway Administration, and the Federal Energy Regulation Commission will be invited to the table to participate in the Database Management Team and/or the Application Advisory Group. Although this funding cannot provide the dollars necessary to meet the needs of every group, it

will allow the initial application to address their top priorities and reporting requirements, while also being scalable enough for agencies needing more to build upon the existing infrastructure.

Stakeholder Involvement: There are two distinct groups of stakeholders involved in this effort: data providers and data users. Both groups must be fully represented in order for this effort to be successful and sustainable for future development. Direct stakeholder involvement of data providers will occur through formal data sharing agreements, resource commitments, or direct financial support from DOE funds for participation of key groups such as WYNDD and WyGIS, and/or requesting participation in the Database Management Team. The data user involvement will come either from participation in the Application Advisory Group or through comments and suggestions solicited during training and outreach activities. Finally, it will be necessary to have an Oversight Committee, comprised of a select few state and federal representatives and also including a representative from both the industry and environmental sectors.

Connectivity: One category of spatial data contained in the database will be current information regarding wildlife migration routes and crucial habitat locations. Part of the maintenance aspect of the database will require adding new and improved spatial data as it becomes available. The goal of the Database Management Team will be to not only maintain Wyoming datasets but also examine crosswalk issues concerning matching these datasets with surrounding states' data. The team will accomplish this through participating fully in regional discussions and meetings regarding this issue, following standards and protocols developed by the WGA in producing spatial data consistent with regional approaches, and by maintaining data at both a regional and landscape scale. Providing a multi-scale database will allow data users access to datasets they may be familiar with from other states while at the same time providing the ability to use more refined and accurate data, which may be developed for part or all of Wyoming. Critical to this will be the documentation and education in regards to the appropriate use of data and applications developed in this effort.

With regards to the connectivity effort established by NatureServe, it is anticipated that WGFD and the Wyoming pilot would mainly participate peripherally by keeping informed about the effort and using any established protocols and/or data analysis techniques created by this effort to help develop similar products. Because this pilot addresses multiple species and includes SWAP data, such as SGCN Priority Areas (Tier 1 data), NatureServe may see a greater role for Wyoming to participate in their efforts. If in the future this is the case, then it will be necessary to look at the financial requirements needed to participate and try to locate the funding to support such an effort here in Wyoming. However, due to our currently limited participation it seems premature to approximate the amount required to accomplish this. Through the WGFD, Wyoming will work directly with NatureServe to assist them in meeting any data needs they may have here in the State.

Climate Change: Although this project is not directly applicable to studying the impacts of climate change on wildlife corridors and crucial habitat, long-term maintenance and archiving of the database will allow changes in these data to be monitored and compared for change detection analysis.

Deliverables and estimated completion time:

1. An initial DSS work plan - month six, or by WGA deadline if earlier
2. A centralized, web-accessible, secure, fully-documented and maintainable spatial database
 - Beta product: month six
 - Final product: month twelve
 - Maintenance and enhancements: continuous throughout project

3. An Internet mapping application supported by accessible web-based and open mapping services
 - Beta product: month twelve
 - Final product: month eighteen
4. Training tutorial and help documents for use and contribution to maintenance of database – month twelve
5. Online help documentation for web application – month nineteen
6. Final pilot assessment – project end date
7. Updated DSS work/maintenance plan – project end date

Outcomes:

1. An overall project Oversight Committee is established
2. A Database Management Team (data providers) is created, with work commitments defined and being performed
3. A fully operational and accessible centralized database is developed, containing the most current and accurate Tier 1 and Tier 2 spatial data with full metadata
4. Protocols and models are identified and documented in relation to the creation of crucial habitat and data modification methods for regional and multi-state use
5. An Application Advisory Group (data users) is formed
6. Full deployment of the Internet-based mapping application is made, providing access to the wildlife database
7. Creation of a series of mapping services following regional standards determined by WGA, Wyoming and surrounding states is developed, allowing for interoperability among other states' DSSs.
8. Development of an Internet mapping module meeting the needs of a partner is accomplished, by which to test and demonstrate the expansion ability of this system

Constraints:

- An important concern focuses on the limitations of technology and the impacts of those limitations, particularly on the speed at which the web application runs (draw times, etc.)

Assumptions:

- Full participation and prioritization is given by identified agencies on the Database Management Team, with knowledgeable individuals in regards to spatial data development and maintenance
- The Oversight Committee defines priorities and guides resource allocation
- WyGIS and WGFD provide co-leadership roles in both database and application development

Contracting:

- Wyoming Geographic Information Science Center, University of Wyoming

Reporting:

- Reports will be submitted directly to WGA by WyGIS, with a copy to WGFD, as frequently as required to comply with DOE's ARRA requirements
- Year one report will be provided to Oversight Committee and WGA
- End of project report will be provided to Oversight Committee and WGA

Budget: See attached Microsoft Excel file named Wy_Pilot_Budget.xls

Western Governors' Wildlife Council
Pilot Project Statement of Work
SUBMISSION DEADLINE: MARCH 19, 2010

Pilot Title: Decision Support System (DSS) Development for Wildlife Resources in California, Nevada, Arizona, and Utah (the Southwest).

Project Objective: California, Nevada, Arizona, and Utah (SW States) will partner to identify areas of conservation potential at a landscape scale across the southwest region. Our goal is to develop a useful and consistent source of mapped biological information across the states, followed by a display tool – a Decision Support System (DSS) - within each state. Developing a DSS is a three-step process that includes Step 1) Compiling types and layers of information valuable in identifying crucial habitat, including important wildlife corridors (aquatic and terrestrial); Step 2) Analysis of information (methodology, modeling, and prioritization) to rank areas as crucial habitat and wildlife corridors; Step 3) Develop the tool to help deliver crucial habitat and corridor information to appropriate users (the actual DSS).

This pilot project initiates DSS development with Step 1 by consolidating, sorting and calibrating species and habitat data among the SW States. We will focus on coordinating data collection methodology, analysis tools, and dataset definitions, attributes, and content, as well as establishing consistent parameters for the scope of datasets in terms of geographic extent and temporal coverage across the SW States. At the end of this pilot project, after 12 months, the SW States anticipate having several calibrated and regionally consistent wildlife and habitat datasets to the extent possible using existing data sets. The pilot will also identify data gaps in one or more state data holdings that could be filled in the future. In Step 2, from 12 to 24 months out we will utilize our newly organized data to delineate consistent crucial habitats and movement corridors for targeted species of concern across landscapes. Step 2 will also involve stakeholders, including industry end users and non-government organizations, to identify information essential for analyzing proposed energy, land use, or transportation projects, or potential climate change adaptation strategies. At the end of this pilot project, each of the SW States will be positioned for Step 3, which is designing, building and implementing a DSS within their state.

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PROJECT DESCRIPTION

Energy Nexus: Throughout the southwest renewable energy technologies are being explored, tested and developed. To meet these new demands, the existing electric transmission

infrastructure will need to be improved in order to effectively distribute the electricity generated by new renewable power facilities to consumers across the western states. Recognizing crucial wildlife areas across the southwest will supply energy developers, consultants, designers, and regulators with information essential to the planning process to design cost effective energy production and transmission projects that do not adversely affect the wildlife resources of the SW States.

DSS Advancement: The completion of phase 1 of this pilot project will result in the creation of a comprehensive and consistent dataset describing the wildlife resources of the SW States. This across state boundaries, the SW States ensure that their approach to DSS design and implementation will be similar and compatible in order to facilitate the effective management of multi-state jurisdictional land use projects.

Federal Agency Coordination: The SW States recognize the extensive and valuable wildlife information resources maintained by the USFWS, USFS, and BLM. These agencies, as well as the NRCS, also collect and maintain valuable non-wildlife related datasets, such as proposed land use development information, existing development infrastructure data, soils and geology information, and other important datasets that will be essential to the development of effective DSSs. The SW States will coordinate with WGWC agency points of contact to facilitate the effective use of data within the SW States Pilot Project. With several federal agencies initiating similar data and strategic planning efforts this year, it is essential the SW States communicate and coordinate with our natural resource partners throughout the course of the project.

Stakeholder Involvement: In the first phase of this pilot project, the SW States will focus on consolidating and calibrating state wildlife and habitat data. We will also coordinate with the Western Regional Partnership to ensure the SW States have use of their habitat GIS layers. Step 2 will involve the WGWC Stakeholder Advisory Group, including representatives from the energy industry, to identify information essential for proposed energy and land use projects.

Connectivity: In Step 2, from 12 to 24 months out (assuming additional funding is secured through WGA and/or other sources), we will use the data from Step 1 to delineate crucial habitats and connectivity corridors for targeted species. Species identified in State Wildlife Action Plans and Important Game Species will be the focus of these connectivity efforts. We anticipate consulting with modeling and technical experts, which will require additional funding.

Climate Change: The southwestern United States will likely experience increased occurrence of invasive species, wildfires, and drought as a consequence of climate change, which may result in negative impacts to wildlife and their habitats. Because the site-specific impacts of climate change cannot be predicted, it is important to monitor habitat to maintain an adaptive approach for flexible management actions as impacts are identified and trends are recognized. SW States DSSs will be an invaluable tool to inform land and resource managers where actions, such as habitat restoration, may benefit wildlife and be more responsive when impacted by climate change.

Deliverables: The SW States anticipate the following tasks and deliverables:

Tasks for months 1 to 12

- 1) Identify types and layers of information valuable in crucial habitat, including important wildlife corridors (aquatic and terrestrial) using the following categories defined in the WGWC White Paper.
 - a. Habitat for “Species of Concern”
 - b. Areas of Significance for Species of Economic and Recreational Importance
 - c. Connectivity or Linkage Assessment
 - d. Native and Unfragmented Habitat
 - e. Terrestrial or aquatic native species richness
 - f. Riparian and Wetland Habitat
 - g. Valued Lands
- 2) Analyze and compare GIS layers between States from the categories listed above (Task 1, a-g).
 - a. Identify those layers and data that are consistent across state boundaries
 - b. Identify those layers and data that only occur in individual states
 - c. Identify those layers with inconsistencies between SW States that may include differences in methodology, prioritization, and modeling of data
 - d. Begin data/metadata assembly and clean up for DSS (level of effort required will vary by state)
- 3) The SW States will share current protocols and methodologies for wildlife and habitat data to identify and remedy areas of inconsistency where feasible. Previous and ongoing WGA efforts, information, and definitions will be utilized in the development of a consistent approach, including crucial habitat and important wildlife corridors.

Deliverables for months 1 to 12

1. Inventoried list of wildlife and habitat data holdings from each state, including an assessment of which data would be applicable for use in a DSS.
2. Outline of particular “conditions of use” on data to be shared across jurisdictional boundaries.
3. Identified significant data gaps that, if filled, would equilibrate the data across state boundaries and improve the overall utility of the DSS.
4. Standardized list of wildlife and habitat layers across state boundaries.

Desired Outcomes: The SW States are committed to using the best available data to integrate into current GIS technologies and other geospatial mapping tools to advance DSS development. The pilot project will develop a site-specific suite of consistent protocols (e.g., standards for defining and collecting data for shared use) utilizing the *Western Regional Wildlife Decision Support System: Definitions and Guidance for State Systems (WGWC White Paper)*. These protocols will help guide future state and regional level investments in DSS by highlighting areas that are important for wildlife habitat and connectivity conservation, including the needs of important economic or recreational species, and those species identified in State Wildlife Action Plans or other comparable assessments.

Constraints and Assumptions: The diverse nature of each of the individual states will certainly provide challenges to provide consistent datasets across state boundaries. Also, each state has different data methodologies for collecting, housing and maintaining information based on their state’s jurisdiction and

government responsibilities. It is for these reasons we believe a 3rd party contractor, with significant professional experience in edge-matching and working with diverse groups and with multi-state resources would be the best option for the SW States pilot project.

Contracting: The SW States will send out a Request for Proposal (RFP) to enlist a qualified contractor to assist the states in consolidating wildlife and habitat data within each state and with data edge-matching. It is essential that the contractor have a track record of working with diverse organizations, is knowledgeable in contemporary GIS technologies, and have the required technical expertise for “edge-matching” between states boundaries. The RFP and contracting will be managed through Utah Division of Wildlife Resources.

Reporting: The SW States will comply with DOE ARRA reporting requirements as determined by WGA. Along with written reports, the SW States will verbally report progress to WGA throughout the course of the project.

Individual State DSS Workplan: Each state has varying degrees of ongoing data and DSS development. A more detailed workplan is forthcoming, however, the following descriptions provide a rough outline of DSS resources with the SW States.

Arizona: Arizona is currently developing a web-based geospatial planning tool intended to allow users to analyze proposed energy, transportation, and other land use projects at a regional scale. Ultimately, Arizona intends to integrate an online site-specific/project-based environmental review as a component of the geospatial planning tool. This is intended to be used as either a benchmark for the 4 state collaborative project, or a template in this effort.

California: In 2004, the Department of Fish and Game (DFG) created the Biogeographic Information and Observation System (BIOS). BIOS is a system that enables the visualization of the spatial distribution of biological data generated by DFG and its [Partner Organizations](#), the management of those data when necessary, and the sharing of those data with Department employees and partners. It is an evolving system and is expected to change in response to the Department's needs and improvements in technology eventually becoming a comprehensive DSS.

DFG is currently building the BIOS database with a dynamic structure designed to handle large volumes of data from many different types of bio-spatial projects. This effort originated from the need to compile data from ongoing and past surveys, monitoring and research projects, mainly in Southern California. Future features may include the development of specialized catalogs of data to meet the needs of distinctive audiences. In addition, we are working to allow Internet reporting of incidental observations to serve both BIOS and the state natural heritage program data called the California Natural Diversity Data Base (CNDDB). See bios.dfg.ca.gov for more information.

Nevada: Nevada's existing Internet Mapping Service (IMS) provides a web-based geospatial analysis tool that will form the framework upon which Nevada's planned DSS will be built. The IMS application currently allows users to access, view, and obtain several wildlife resource data layers, as well as background information data layers, that are maintained by the Nevada Department of Wildlife (NDOW). As development continues, more of NDOW's data layers will be integrated into the IMS and enhanced capabilities will be added to allow live geospatial data editing, both within and outside of the agency, seamless data updates, expanded data accessibility, and proponent-driven land use planning analysis

Utah: Currently, the Utah Department of Technology Services is developing a web-based geospatial planning tool for use by natural resource agencies, land use planners and transportation developers. Negotiations are underway to assess whether this existing planning tool may be adapted to include wildlife corridors and energy resource areas to develop into Utah's DSS.

The Utah Division of Wildlife Resources partnered with The Nature Conservancy to produce a large scale assessment and map of conservation action areas in Utah. Wildlife Action Plan (WAP) species and habitat layers were input into a reserve-design spatial model using MARXAN software to generate an optimal set of places that collectively contains "enough" of the key habitats and sensitive species for long-term security of Utah's wildlife diversity. The map includes a set of tables in a relational database that show explicit linkages between species/habitats, threats, conservation actions and places that would represent the priority areas for WAP implementation.