Great Plains
Landscape Conservation Cooperative

U.S. Fish & Wildlife Service

Region 2

December, 2009

Great Plains Landscape Conservation Cooperative Action Plan

Introduction

Over the last century the Great Plains region has been extensively modified to maximize agriculture production. Measures were taken to maximize crop production and forage production on rangeland sites. As a result, a tremendous strain has been placed on this landscape adversely affecting populations of priority species. The conservation community has actively been delivering conservation measures, but priority species continue to decline. Over the last 20 years advances in computer hardware, software, and analytical techniques have provided conservation practitioners with new tools to effectively deliver conservation, assess impacts of conservation actions, and evaluate habitat capacity to support target populations. Much conservation work has been accomplished, but there is much more that can be done.

The capacity does not yet exist to develop landscape plans for all priority species throughout the Great Plains. Landscape Conservation Cooperatives (LCCs) provide an opportunity to fill this void. Landscape Conservation Cooperatives are applied conservation science partnerships that will provide science and critical tools to inform, protect and conserve landscapes that will support priority species at target levels. They will provide the science to inform management decisions. These partnerships between the U.S. Fish and Wildlife Service (FWS), the United State Geological Survey (USGS), other federal agencies, states, tribes, non-governmental organizations (NGOs), universities and other entities within a geographic area will inform resource management decisions to address regional scale stressors, help inform management regarding the potential impacts of climate change, and develop resilience and/or adaptation strategies to address climate change. Within any given LCC, all of these actions will be completed in an integrated fashion across landscapes.

This preliminary action plan is a starting point to outline the form and function of the LCC that will support the Great Plains. During the initial assessment, the need for expertise in population modeling, genetics, biometrics, hydrology, and collection of monitoring data were identified as critical needs of the GPLCC. We will work with our partners to determine how best to meet these critical needs. Some of these needs may be met using the GPLCC FY2010 allocation,

while others may be met through our partners. Developing this infrastructure will inform the conservation community about current landscape conditions, develop explicit population goals, enhance delivery effectiveness, and ultimately result in landscapes that are capable of supporting target populations of priority species.

Anticipated climate change effects for the GPLCC area

Climate models predict increased warming, throughout the LCC area, and for some areas of the geography, greater precipitation. Maximum and minimum temperatures rise in both scenarios. Minimum temperature increases are greatest, indicating increased nighttime warming. Models show both increases and decreases in precipitation over the region and the seasons, although the overall trend is anticipated to be slightly wetter in the Great Plains region. The snow season in the Great Plains is projected to end earlier in the spring, reflecting greater warming in winter and spring. Regional change in climate variability and extreme events may affect various aspects of Great Plains ecosystems. First, changes in winter moisture may impact cool season invasive plants, the extent of sagebrush and other woody perennials on the range, shallow aquifer recharge, streamflow timing, and forage availability and quality. Second, warmer winters may impact the incidence of pest outbreaks, soil organic matter, plant community composition, and the invasion of exotic plants. For example, leafy spurge and Japanese brome may move further south. Third, summer increases in temperature and precipitation may impact the frequency and intensity of hail storms, invasive tree species, and fire management. And last, a change in the frequency and duration of extreme precipitation events can lead to the opposing problems of drought and deluge, as well as early fall and late spring snow storms which can bring problems all their own. (Paraphrased from a 2003 report on climate change and the Great Plains – Preparing For A Changing Climate. http://www.nrel.colostate.edu/projects/gpa/).

Description of Area

In FY 2010, Region 2, in cooperation with Region 6, will develop the Great Plains Landscape Conservation Cooperative (GPLCC) to enhance science capacity throughout the Great Plains area. The geographic area of the GPLCC encompasses parts of eight states: New Mexico, Texas, Oklahoma, Colorado, Kansas, Nebraska, South Dakota, and Wyoming. In planning for this LCC, we engaged the states that represent a majority of the geographic area.

The boundary of the GPLCC falls along the boundaries of Bird Conservation Regions (BCR) 18 (shortgrass prairie) and 19 (central mixed-grass prairie). The GPLCC boundary also corresponds with the administrative boundaries of the Playa Lakes and Rainwater Basin Joint Ventures. The administrative boundary of the Rainwater Basin Joint Venture is restricted to the BCR 19 portion of Nebraska, the remaining areas within BCR 18 and 19 are within the administrative boundary of the Playa Lakes Joint Venture.

The GPLCC area also encompasses three formally recognized partnerships as part of the National Fish Habitat Action Plan (NFHAP). The northern half of the GPLCC geography encompasses the Great Plains Fish Habitat Partnership (GPFHP) in the states of CO, NE, KS, SD, and WY. The southern half of the GPLCC geography encompasses the Southeast Aquatic Resources Partnership (SARP) within the states of OK and TX. Multiple reservoirs in all states within the GPLCC area will be included in the Reservoir Fisheries Habitat Partnership. Please see the map (Figure 1) for the boundary of the GPLCC area.

Federal lands within the GPLCC area include: Bureau of Land Management public lands in southeastern New Mexico, 11 Fish and Wildlife Service National Wildlife Refuges, and USDA Forest Service National Grasslands and National Forests in New Mexico, Oklahoma, Texas, Colorado, Kansas, and Nebraska, and lands managed by the Department of Defense, Bureau of Reclamation, and National Park Service. State –owned lands are expected to be an important component of the GPLCC area, many contribute habitats necessary to support priority species. The majority of the GPLCC area is under private ownership. Incentives that encourage private landowners to manage their lands in ways that contribute to wildlife habitat values and providing tools that help strategically target those incentives will be important considerations of the GPLCC. Understanding the ability of the landscape to support target populations of priority species will require robust information and the cooperation of landowners in the GPLCC area.

Starting point for the LCC

There are many existing conservation partnerships within the GPLCC area; besides the fish habitat partnerships most are focused on the conservation of grasslands and wetlands for waterfowl and other migratory birds. Strong partnership coalitions have already been built within the Playa Lakes and Rainwater Basin Joint Ventures. Examples of these are the Nature

Conservancy (TNC), state fish and wildlife agencies, Natural Resource Conservation Service (NRCS), Farm Service Agency (FSA), and Fish and Wildlife Service (FWS) Partners for Fish and Wildlife program. The challenge in the GPLCC is to invite all the conservation partners to work together for shared conservation goals. The nucleus of the GPLCC will be the Joint Ventures-utilizing their strong local partnerships and their models of collaboration to broaden the conservation vision for the GPLCC. The GPLCC is a step ahead of the conceptual stage, but there is much work to do to engage all the partners. For instance, the Prairie Grouse Partners, a new partnership formed in 2009, announced its intent to restore 20 percent of North America's grasslands, guided by the Grassland Conservation Plan for Prairie Grouse, developed in 2007. It will be critical for the GPLCC to invite these partners, along with the others that are already working within the GPLCC area, to establish a rigorous science based conservation platform following the elements of Strategic Habitat Conservation (SHC). The SHC elements include biological planning, conservation design, conservation delivery, and monitoring/research/evaluation.

Partners

We have contacted and spoken with the State Fish and Wildlife Directors, most of our Federal land managers (Bureau of Land Management, National Park Service, Bureau of Reclamation, USDA Forest Service), the Environmental Protection Agency (Region 8), USGS, and the Playa Lakes and Rainwater Basin Joint Ventures coordinators. We have received some initial input on priority species and habitats from some of the State Fish and Wildlife Directors. Everyone we have spoken to has been supportive of the GPLCC concept and has indicated a willingness to participate. EPA is especially interested in working within the GPLCC area on issues relating to wetlands, water quality and quantity, and climate change effects on habitats.

To date, the following partners have been contacted:

- State Fish and Wildlife Directors of New Mexico, Texas, Oklahoma, Colorado, Kansas, and Nebraska, and USGS (in a conference call with R2 Regional Director and R6 Deputy Regional Director on November 9, 2009)
- Playa Lakes and Rainwater Basin Joint Ventures Coordinators (meeting with LCC advisory team on November 12-13, 2009)

- FWS R2 and R6 hosted a Great Plains webinar on December 4, 2009 for State Fish and Wildlife Directors (NE, CO, OK, TX, NM, KS), Bureau of Reclamation, USDA Forest Service, Bureau of Land Management, National Park Service, USGS, and Playa Lakes and Rainwater Basin Joint Ventures Coordinators.
- EPA Region 8 and various NGO's (TNC Oklahoma and Texas, and U.S. Shorebird Conservation Plan Council)

Plans are in place to contact representatives from NRCS, the FSA, State land departments, other Department of the Interior (DOI) agencies, and other NGO conservation organizations with interests in the fish, wildlife, and plant resources of the GPLCC area. Internal and external outreach will be conducted by various methods, including webinars, presentations, and meetings.

A steering committee will be formed for this LCC, and we plan to have an initial meeting of core members of the steering committee in January/February 2010. An invitation has been extended to State Fish and Wildlife Directors, Joint Venture Coordinators, Federal land managers, other DOI and USDA agencies, EPA, other state agencies, and NGOs.

In addition to engaging our external partners, we are starting an internal dialog on how best to integrate new capacities that are expected under the FWS National Wildlife Refuge System (NWRS) climate change funding allocation with the science capacities of the GPLCC. There will be opportunity for collaboration between the LCC staff and the staff hired through the NWRS Inventory and Monitoring Program. Shared and integrated monitoring protocols between the NWRS and the GPLCC area will enhance our ability to effectively address climate change impacts across the landscape. These monitoring protocols could also assist our external partners such as the National Forest System Grasslands. Once further discussions have taken place, both internally and externally, and needs for the LCC are solidified, a robust monitoring strategy can be developed. This monitoring strategy will need to outline the appropriate monitoring to better understand priority species, refine key uncertainties critical to the biological foundation, and ensure the monitoring data collected will be applicable to develop conservation design tools that will help guide conservation delivery to address limiting factors for priority species. This strategy will help to maximize the contribution of new NWRS hires, and will likely highlight additional positions or skill sets the LCC should provide to ensure monitoring is statistically sound and can be analyzed to develop spatially-explicit species-specific models. Additional

climate change allocations available to FWS Fisheries and Partners for Fish and Wildlife Programs should enhance conservation delivery in the GPLCC.

As the partnership develops more fully, we will determine the potential contributions and resources that can be leveraged through participation of partners. USGS will be a full participant in the GPLCC, but the agency's fiscal contribution has not been decided. The Joint Ventures are in full support of the LCC, and have indicated they are interested in a central role in the management of the GPLCC. That role will be further defined during subsequent discussions between FWS, the Joint Venture Management Boards, and the steering committee. The shared GIS infrastructure of the Playa Lakes and Rainwater Basin Joint Ventures is a ready resource for the GPLCC. Region 2 has recently hired a Southern Plains Coordinator, based out of Lubbock, Texas. That individual's primary role is to facilitate and expand partnerships in the southern portion of the GPLCC area for lesser prairie chicken conservation and other trust resources in the area. A portion of the Southern Plains Coordinator's time will be dedicated to working with the GPLCC.

A central question the steering committee will need to deal with early on is how the GPLCC will function to address science needs. We believe the Flyway Council model of adaptive harvest management implementation is a fine example of shared science capacity among partners (states, USGS, FWS) toward a common, complex science question. This model has direct application to the question of how to ultimately use the science to guide the delivery of conservation on the ground because there is a direct and formal link between the scientific process and decision-making. We anticipate that the approach of pooling experts from a number of agencies and organizations and applying their skills to identify priority science needs for the benefit of the collective will be the primary mechanism by which the GPLCC acquires the needed information.

Highest Priority Species and Habitats within the GPLCC

Six landscapes have been identified as possible high priority landscapes within the GPLCC area. These landscapes were defined by the GPLCC advisory team, State Wildlife Plans, and eco-regional plans developed by TNC and FWS. The suggested landscapes are: 1. contiguous grasslands in the short grass and mixed grass prairies, 2. playa wetlands, 3. riparian streams, 4. prairie rivers, 5. cross-timbers, and, 6. savannahs, shrub lands and sand dune systems. These

landscapes, while not all-inclusive of the fish, wildlife, and plant habitats within the GPLCC area, represent important habitats for a variety of species.

An initial list of species, with habitat needs that range from un-fragmented grasslands (lesser prairie chicken) to specialized habitat requirements, such as sand dunes (blowout penstemon), has been generated, is summarized in the table below. The priority species and habitat will be refined with additional discussions with our partners.

Habitat	**Priority Species**
Contiguous grasslands	Lesser prairie chicken, black-tailed prairie dog, burrowing owl , American bison, American burying beetle, black-footed ferret, mountain plover, ferruginous hawk
Playa wetlands	Northern pintail, whooping crane, snowy plover, long-billed curlew
Riparian streams	Arkansas River shiner, Arkansas darter, Topeka shiner, pallid and shovelnose sturgeon, paddlefish
Prairie rivers	Piping plover, interior least tern, sandhill crane, whooping crane
Cross-timbers	Black-capped vireo
Savannahs, shrub lands, and sand dunes	Sand dune lizard, blowout penstemon, American burying beetle

There are portions of these habitat types in the Plains and Prairie Potholes LCC, being developed by Regions 3 and 6. Preliminary discussions with Region 3 indicate that we have shared conservation concerns regarding grasslands, riparian streams and prairie river habitats, migratory waterfowl, and grassland birds. LCCs are intended to eventually form a national network of science partnerships that facilitates working together across LCC boundaries to conserve similar habitats and wide-ranging species.

Anticipated conservation delivery mechanisms:

The following groups, organizations, and programs will utilize science products and deliver conservation in the GPLCC area. Additional groups and organizations will be identified with further input from our partners.

- Farm Service Agency
- FWS Partners for Fish and Wildlife
- National Wildlife Refuge Systems
- NRCS: Conservation Reserve Program, Wetlands Reserve Program, Grassland Reserve Program, EQIP program, etc.
- State Wildlife Action Plans and State Wildlife Grants
- FWS Recovery plans, Spotlight Species Action Plans and Endangered Species Recovery funds
- FWS Migratory Bird Focal Species Action Plans
- National Fish and Wildlife Foundation Grants: Grassland Initiative Program
- Bureau of Land Management: Restore New Mexico Program

Science needs in the GPLCC:

The following preliminary list was developed during discussions with partners and our advisory team. It is certainly not inclusive, and will be refined with further partner input. Additionally, our initial conversations with partners indicate there are differences in opinion about the need, and possible approaches, to address some of these science needs. Face-to-face discussions by the steering committee will be necessary before decisions can be made on approaches to address these needs.

- Assess the effect of climate change on the discharge regimes in large river systems. (e.g. Platte River).
- Assess the effects of climate change and groundwater uses on small plains streams and the many species they support.
- Assess candidate, state-listed, species of greatest conservation need, and non-native species to determine vulnerability to climate change.

- Design strategies to facilitate range-wide recovery and reintroduction of black-footed ferrets to appropriate habitat in the GPLCC to maximize population resilience.
- Assess the interrelatedness of hydrological changes due to climate change and the temporal and spatial incidence of parasites and chytrid fungus with amphibian malformations in the GPLCC area.
- Expand capability for early detection and response to non-native terrestrial and aquatic species.
- Development of a spatially-explicit population viability model for lesser prairie chicken.
- Conduct a molecular genetic analysis of lesser prairie chicken to provide vital information about which populations are more important and which are not. This analysis would identify demographically independent populations and could be used to delineate management units and manage the effects of human activities on the abundance of individuals within populations.

- Assess the effects of sediments in playa wetlands.
- Quantify and delineate suitable habitat for lesser prairie chicken in the GPLCC area.
- Development of statistically valid model for projecting climate change effects on playa wetlands.
- Collection and analysis of monitoring data throughout the GPLCC area.

Decision-Support tools and Science Capacity Projects

The following discussion presents examples of potential products and users that could result from planning efforts of the GPLCC. These Strategic Habitat Conservation (SHC) products would be built upon existing capabilities and tools currently utilized (and produced) by Playa Lakes and Rainwater Basin Joint Ventures. These products address some of the needs presented in the previous section and provide a logical starting point for the GPLCC.

- **Lesser prairie chicken habitat delineation:** This species' populations are in decline, and its range is entirely within the GPLCC area. A product that describes

and maps suitable areas for lesser prairie chicken throughout its range, along with areas where restoration would connect blocks of habitat and populations of lesser prairie chicken is needed. The potential users of this information could be: FSA (allows for informed decisions regarding targeted Conservation Reserve Program (CRP) grasslands to connect lesser prairie chicken populations), energy industries (decisions regarding placement of wind turbines, transmission corridors, and other infrastructure relating to energy development), and state wildlife agencies and FWS Partners for Fish and Wildlife Program (targeted efforts for lesser prairie chicken habitat restoration).

- **Impact of sediments in playa wetlands:** Climate change predictions for the GPLCC area include less overall precipitation and increases in temperature. The precipitation may be reduced, and is likely to occur in less frequent, but higher intensity events. How will these rainfall events affect the wetlands? High intensity rainfall will likely increase soil erosion and sedimentation in nearby playas. Research is needed to test these hypotheses regarding the effects of climate change on the function of playa wetlands. Once this research is completed, models can be developed to simulate different rates of sedimentation and potential effects to wildlife dependent on these areas. Potential users of this information would be FSA (inform decisions regarding locations for wetland protection), States, and FWS Partners for Fish and Wildlife Program (identification of areas for long-term protection, and habitat restoration).

- **Climate change scenario planning within the GPLCC:** Conservation strategies for management of habitats and species within the GPLCC area will be evaluated and may change to adapt to climate change effects. In a workshop setting, conservation partners, scientists, and others interested in the conservation of the area, would evaluate how the Intergovernmental Panel on Climate Change (IPCC) scenarios might affect critical ecosystem processes and/or priority species and habitats in the GPLCC area, and discuss management options that will address anticipated changes. The vulnerability of priority species to climate change needs

to be assessed. Hypotheses regarding anticipated effects to ecosystems, habitats, and species will be generated and research needs prioritized for funding. Climate change scenario planning is an invaluable tool for all conservation partners working within the LCC area.

- **Development of statistically valid models that relate current climate conditions to observed playa wetlands:** This is a spatially-explicit tool currently used by the Rainwater Basin Joint Venture to relate local temperature and precipitation data to observed wetland habitat available during waterfowl spring migration. We suggest developing the tool for the remainder of the GPLCC area, allowing for the integration of climate change into effective conservation delivery. Understanding playa wetland function under different weather scenarios will help evaluate IPCC models and the potential long term function of this wetland system. This tool would be useful to any of the conservation partners to inform decisions regarding wetland protection and restoration, and predicting habitat needs.

- **Collection of statistically valid monitoring data:** In order to refine current conceptual models or create new statistically valid empirical models, existing monitoring data needs to be analyzed and new monitoring data needs to be collected. It is critical that the new data is collected in a rigorous, statistically valid fashion. Currently in the GPLCC there are models for several priority species. These models have been derived from existing monitoring data and analyzed to derive secondary products in the form of Decision Support Tools (DSTs). These DSTs help answer the difficult conservation questions of: 1) How much more habitat is needed? and, 2) Where are the priority areas to deliver this habitat. Examples of these tools include identification of critical playa complexes for migrating and wintering waterfowl, delineation of contiguous grasslands that support significant numbers grassland nesting birds, as well as identification of priority migration wetlands for Whooping cranes.

There are existing monitoring datasets that have not been analyzed to develop additional statistically valid models to describe species habitat relationships throughout the GPLCC area. Sufficient staff resources are not available to complete these analyses. Strategically increasing monitoring and associated staff capacity will be necessary to provide the baseline information for conservation planning and implementation within the GPLCC area. If this monitoring is developed appropriately, models that evaluate outcomes of conservation actions can also be produced. These models could be used to provide accountability measures that are biologically relevant rather than the traditional standard of acres and dollars. In summary, enhanced monitoring data and analytical capacity will provide validation of existing conceptual models; provide a mechanism to refine existing conceptual models; and provide information to develop new models for other priority species.

A focus of the ongoing planning process will be the determination of goals for the improvement of habitat and sustainability of species within the GPLCC area. These goals and related objectives will be determined with further partner discussions in 2010.

Science capacities

Each LCC is required to have an LCC Coordinator and a Science/Technology Coordinator. We anticipate spending approximately $300,000 for these positions. The following section describes additional science capacity that will be necessary in the GPLCC to address the science needs described in the previous sections. Further discussions with our partners will be needed to determine and prioritize how our science capacity needs will be met.

As stated in the previous section, an increase in monitoring activities within the GPLCC area has been identified as a critical need. As such, biometricians and scientists familiar with monitoring design and implementation will be needed. At least one biometrician will be needed, along with monitoring specialist (someone familiar with monitoring protocols and design). Region 2 intends to hire one scientist with expertise in population modeling and biometrics to support the GPLCC (and other LCCs as they are developed). This position will cost approximately $140,000. Assessing climate change scenarios to conserve stream fishes will require skills in

hydrology to model changes in discharge and predict subsequent changes in habitat as well as skills in civil engineering to design appropriate functional fish passageways at current barriers to reconnect populations. Additional scientific expertise may be available to us through USGS, when that agency determines what its role will be in the LCCs. For example, the USGS Mid-Continent Geography Center and EROS lab in Sioux Falls, South Dakota may be available to assist us with remote sensing, GIS mapping expertise and infrastructure.

The identified monitoring expertise may be acquired through new positions hired by our NWRS with their 2010 inventory and monitoring monies. This will be a point of further dialog within our Region. Many of the conservation delivery tools described above relate to GIS products and capabilities, and will require additional staff trained in GIS analysis and modeling. We have existing staff with GIS capabilities that may be assigned to the GPLCC as needed. In addition, GIS capabilities may be added to the staff at the Joint Venture office(s) or in other partner offices to allow for development of the GIS tools to support the development of our conservation delivery products.

It is important to recognize that monitoring cannot be separated from the GIS capacity. These skill sets work in tandem to produce the products that make SHC a viable effective business model. The GIS and associated software is just the tool that transforms statistically valid monitoring data into spatially explicit species models that quantifiably represent highest priority landscapes and habitats for priority species. Without both datasets (GIS and monitoring) and professionals (statisticians/biometricians and GIS modelers) we will not be successful at generating the LCC performance measures and ultimately delivering landscape conservation that supports populations of priority species.

The communication aspect of the LCC is critical. FWS external affairs staff will be available for working within the GPLCC, but additional communication expertise will be needed to support the GPLCC Coordinator in engaging, managing, and building the partnerships and relationships. Communication expertise may be met through additional personnel hired by the Service, provided through the GPLCC partners, or through a shared position.

GPLCC's top science needs (greater than our science allocation)

What follows are brief outlines of proposed projects based on discussions with the GPLCC advisory team. We will submit more detailed proposals when requested.

Bison herd management and genetics:

The Department of the Interior has a unique opportunity to promote the conservation of bison in North America. There are existing multi-partner efforts to restore populations of bison through their historical range. One of the challenges in dealing with the limited number of bison herds is to understand the implications of genetic diversity and variability and cattle gene introgression, within and between managed herds, and the role of selective culling on these issues. There is a need to develop genetic variation targets, timeframes, and selection methods for each herd. Additional genetic testing and modeling is required on existing herds within the GPLCC area. Currently FWS NWRs managing bison are implementing culling selection utilizing genetic information in an attempt to meet two objectives:

1. Conserve and retain as much bison genetic diversity as possible
2. Minimize or at least not exacerbate the level of cattle gene introgression.

Ultimately, bison reintroduction goes beyond the boundaries of the GPLCC area, including NWRs in Regions 2, 6, 3, and National Park Service units in Grand Teton, Yellowstone, and the Grand Canyon. Six NWRs actively manage bison - they are: Wichita Mountains, Fort Niobrara, National Bison Range, Sully Hills, Rocky Mountain Arsenal, and Neil Smith. The development of a coordinated master genetics framework would be a vital step forward in the overall conservation of this species.

<u>Data Needs Beyond Current Funding</u>

Use existing data to model the long-term effect of culling strategies to better understand and predict the benefits and consequence of different strategies. The Region 6 Wildlife Health Office coordinates the collection of, and maintains, genetic records of bison from the six NWRs actively managing herds. In the absence of natural selection, herds must be culled. To lessen the possibility of impacting herd genetic diversity by culling an

individual that may contain rare alleles, the present NWR allelic richness culling strategy involves using genetic information to inform culling decisions. Formerly, many of the NWRs managed bison primarily through random calf culls. There is confidence that allelic richness culling strategy does not negatively affect herd genetic diversity, however direct comparisons between the present strategy and random calf calls have not been made. Modeling and comparing the long-term effect of these strategies would provide the NWRs and partner bison managers a powerful adaptive management tool to inform decisions (estimated cost: $150,000-200,000).

Cattle gene introgression is believed to be present in most, and possibly all, of the actively managed NWR bison herds (although expected, it has yet to be detected in the Sully Hill's herd). All federally administered herds (including Yellowstone) have either originated, or had individual bison introductions, from 19th century private herds, the ranchers managing these historic herds were known to have experimented with cattle-bison hybridization and there is a potential that all bison herds are introgressed. Additionally, the level of natural genetic overlap between these two closely related Bovids is poorly understood, which further complicates discussion and development of a management strategy to directly resolve or mitigate the occurrence of introgressed alleles. Utilizing pre-European settlement bison genetic material, and recently developed SNP (single nucleotide polymorphism) analysis (a bovid chip has been developed), we have the opportunity to produce a much more rigorous understanding of genetic overlap between bison and cattle. This project has the potential to make a significant contribution to the discussion of short-term management of introgressed bison herds and to the long-term development of landscape restoration strategies (estimated cost: $150,000-200,000).

Native fish inventory/habitat assessment - Native non-game fishes are monitored infrequently in Great Plains rivers and streams and many surveys are likely out of date. Without baseline data of species assemblages and abundance, true evaluation of restoration efforts cannot take place and implementation of adaptive management cannot occur. A crucial initial step will be to collate existing distributional maps of native and exotic species from historical surveys; this is the first goal listed in the GPFHP strategic

plan. The second goal of the GPFHP is development and establishment of standardized monitoring programs for fish, water quality, and habitat conditions. As part of the NFHAP, a national assessment of fish habitats is underway and data standard operating procedures (SOPs) are being developed to enable integration of regional data sets in order to apply SHC principles in conservation planning for aquatic habitats. A national GIS coverage of fish barriers has been started by FWS (in the Washington Office) but this data set need to be validated (GPS locations, barrier type and condition, owner of the barrier etc.). A national GIS layer of all fish barriers interfaced with species assemblage information will be a crucial tool to prioritize management actions strategically to reconnect populations or prevent further spread of aquatic nuisance species. The estimated cost for the barrier validation would be approximately $50,000/hydrological unit code (HUC), and there are about 100 HUCs in the GPLCC area (estimated cost: $5,000,000). The cost of doing native fish assessments throughout the GPLCC would exceed $4,000.000. The survey areas in the GPLCC would need to be prioritized.

National Wetland Inventory for GPLCC: Finish the National Wetland Inventory for the area. Out of the 5,355 quads in the area, 2,170 need to be completed. These data could be used to refine landcover, develop conceptual and empirical models for priority species, assist ES with regulatory reviews, and understand habitat losses that have occurred since the initial NWI data was collected. (estimated cost: $434,000).

Projected climate induced habitat range shifts for Lesser prairie chickens: The proposed research would model vegetation composition in the Great Plains under future climate change scenarios. The resulting models would be used to estimate the effectiveness of CRP grasslands to provide habitat and connectivity under future vegetation/habitat predictions. The value of this type of analysis is that it can be used for other species, when data on species' distribution and habitat requirements become available (estimated cost: $82,000).

Successes for 2010

Full and complete partner engagement will be a goal for the GPLCC that we plan to achieve this fiscal year. We also anticipate that one of the functions of the GPLCC will be to act as a

"clearinghouse" for information for its partners. During 2010, we are going to meet with our partners, discuss what resources (data, staff, models, etc.) are currently available and collect, consolidate and provide that information in a platform that partners and others can access. Data-sharing is a vital and necessary component of our LCC, and our planned conservation work cannot proceed without an analysis and synthesis of our datasets. The GPLCC will focus on data that supports the science projects and models to be worked on in FY 2010.

What is unique about the GPLCC?

Temperate grasslands represent one of the most altered and least conserved habitat types on Earth, with more than 40 percent of their total area worldwide converted to agriculture. The biodiversity and ecological processes of the grasslands face serious threats, habitat loss and degradation being two of the most significant. Despite this degradation, the grasslands still include an assemblage of over 2,000 native species of plants and animals. For example, the black-tailed prairie dog creates living space for scarlet mallow and prickly pear cactus, also making food and shelter for insects, birds, mice, rabbits, hares, and the burrowing owls reoccupy old prairie dog burrows. In addition, 160 species of vertebrates, two species of rattle snakes, hawks, weasels, skunks, badgers, bobcats, coyotes, foxes and the endangered black-footed ferret prey on prairie dogs.

The Great Plains landscape overlays the world's largest aquifer, the Ogallala Aquifer, and the playa wetlands unique to this landscape are the principal recharge mechanism for the aquifer that is critical to the health and survival of both human populations and wildlife in the heartland of America. The Ogallala Aquifer is the single most important water source in the Great Plains region. Prairie streams are a network of waterways that are truly unique sets of habitats on the Great Plains. The Great Plains ecosystem generally receives less than 30 inches of rainfall annually with temperature extremes of -40◦to 115◦ F. A fundamental requirement to the persistence of Great Plains aquatic fishes and mussels is sustaining river flows and reestablishing connectivity.

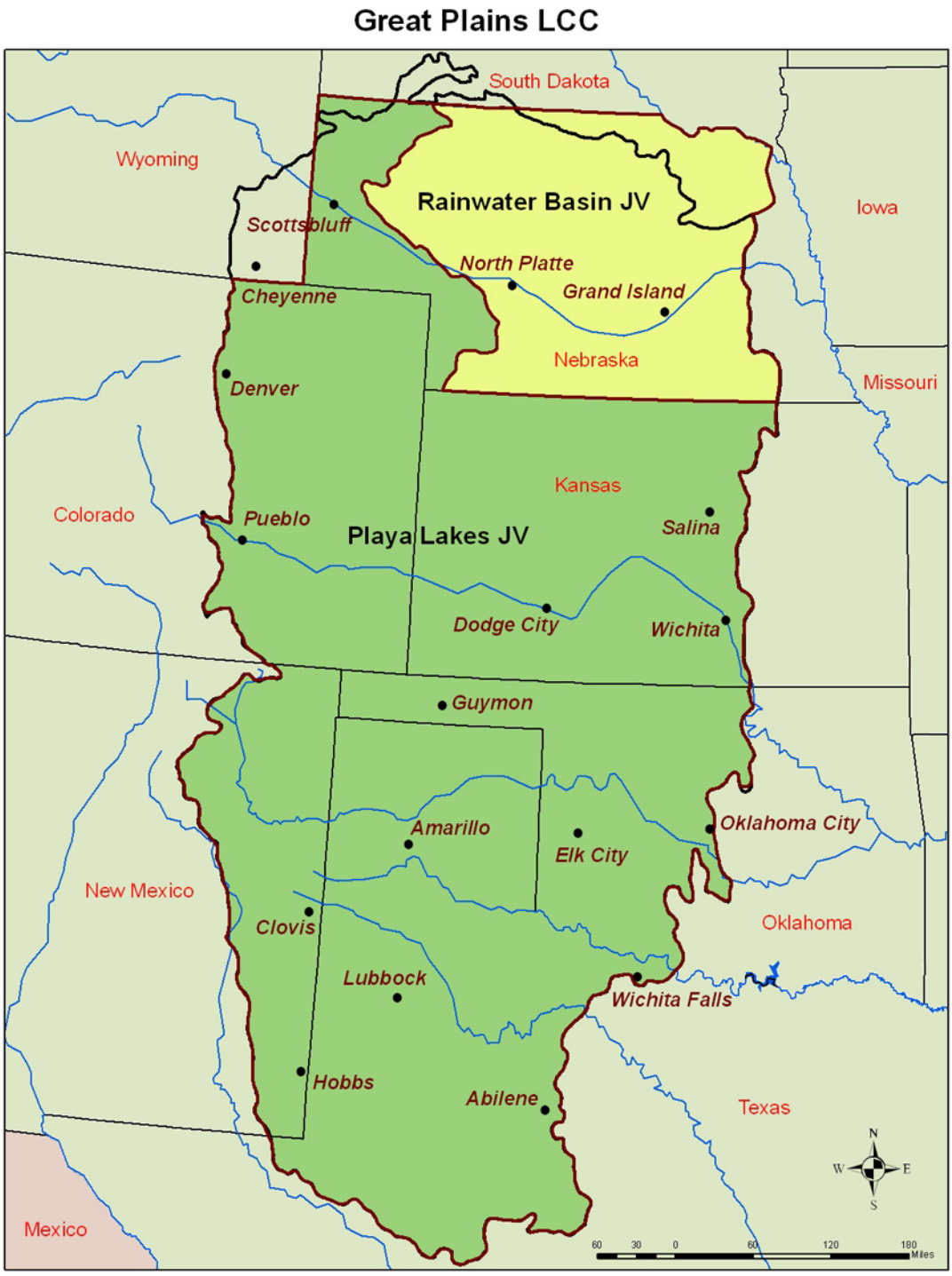
The Great Plains contain one of the most unique wetland ecosystems in the United States-playa wetlands. These playas (shallow lakes) attract and provide habitat for a variety of wildlife species. It is estimated that over 90 percent of wintering waterfowl in the Texas panhandle utilize

playas as their primary habitat, and the playas of the Great Plains rank a close second to the Gulf Coast as the most important area for waterfowl and shorebirds within the Central Flyway.

Additional LCCs for Region 2 in FY 2010

Region 2 plans to start on the development of the Desert and Gulf Coast and Prairies LCCs during FY 2010.

We will assist R4 in the development of Gulf Coast Plains and Ozarks, and Region 6 with the Southern Rockies LCC.


Great Plains LCC
South Dakota
Wyoming
Rainwater Basin JV
Iowa
Scottsbluff
North Platte
Grand Island
Cheyenne
Nebraska
Denver
Missouri
Kansas
Colorado
Pueblo
Playa Lakes JV
Salina
Dodge City
Wichita
Guymon
Oklahoma City
Amarillo
Elk City
New Mexico
Oklahoma
Clovis
Lubbock
Wichita Falls
Hobbs
Abilene
Texas
Mexico
N
W
E
S
60 30 0 60 120 180
Miles