



## **RESEARCH NEEDS**

(Priority questions in bold)

Updated January 2018

### PLAYAS: Management, restoration, and conservation programs

- **What is the food production (seeds and invertebrates) being provided by cropped / grazed wetlands? What are the differences in production / grazing practices among different cropping techniques? Anecdotally, we have noticed wide ranges in invertebrate production among different cropping practices and the types of crops planted in wetlands in central Oklahoma.**
- **Are there methods that will improve buffer function (e.g. allow water to flow and inundate playas and still catch sediment)?**
- **Are there methods other than traditional buffers immediately surrounding a playa that can be used to reduce sediment inputs?**
  - An example would be to identify where in the watershed of a playa that sediment is most likely coming from and then giving priority to treating the sediment source area (e.g., planting it to grass, implementing conservation tillage, etc.). This may allow the playa to be protected from sediment and allow water to reach the playa.
  - Another example is engineering solutions to direct storm water run-off into playas. But, care must be taken to not introduce more sediment or to allow roadside contaminants to be introduced to the playa, they should be filtered out through buffers or filter strips.

### PLAYAS: Western Great Plains playa ecosystem

- **What characteristics of playas or playa complexes attract high densities of bird use? Where are the core migratory stopover / staging areas? How are they projected to change as climate changes?**
- **How many playas do we need to maintain the playa ecosystem across the western Great Plains? Albanese and Haukos (2016) did a network analysis which answered this question for the Southern High Plains but, one for the northern part of the JV and/or across the whole region would be excellent.**
- **How does landscape context and land use affect playa invertebrate populations? We really need to look further at how proximity to other wetlands and different hydroperiods, surrounding land-use practices, temporal (i.e., drought) and spatial scale (i.e., at what scaling will be able to maintain viable invertebrate communities as food resources).**
- **Test the results of the network analyses of Albanese and Haukos (2016) using empirical data to test this. Development of some long-term monitoring that could be imbedded in an adaptive management approach might one way to further look at where we are relative to number of playas on the landscape and management of those playas**

- **Develop models or indices to make a “survival estimate” for a playa given its landscape context – probability of a playa “being alive” and probability of loss related to a playa’s ability to support wetland birds and ability to perform hydrological functions**

#### PLAYAS: Hydrology

- **Playas are wetlands and perform wetland functions including “cleaning water”. We need to quantify the benefits of playas to water quality in the aquifer.**
- **Are all playas equally valuable for recharge? How do soil types and underlying stratigraphy influence infiltration, duration of inundation, and aquifer recharge rates of playas?**
- **What is the impact of culturally-accelerated sediment accumulation in playas on the rate of aquifer recharge?**
- The JV continues to get proposals and questions about digging playas out in the context of increasing recharge. What are the real effects of digging out/punching a hole in a playa? From the context of removing accumulated sediments through to taking out some or all of the clay layer.

#### AVIAN ECOLOGY (Grassland and Wetland)

- **Are there thresholds of habitat availability below which bird population numbers begin to decline precipitously? Are there common life history characteristics among the bird species that show threshold effects at different amounts of habitat loss?**
- **What are the differences in use by migrating wetland dependent birds of annually cropped playas versus playas that are mostly idle (e.g., enrolled in a CRP practice such as Migratory Bird Safe, CP23, etc.)?**
- **Response of migratory wetland dependent birds to spatial and temporal changes in wetland availability across the entire region. This idea is similar to the work of Albanese and Davis (2013), but on a much larger scale.**
- **How do the activities within river watersheds impact ecosystem services? The focus should be on scales that can inform conservation action and policy.**
- What are the area/spatial requirements of breeding and non-breeding resident grassland birds in relation to patch size/fragmentation and other grassland habitat characteristics in the PLJV? – Literature review.
- Some climate projects indicate an increase in fallow, abandoned fields, as the aquifer declines, climate change plays out, and farmers potentially abandon their fields. Will birds use these?
- What is the average and range of stopover duration of waterfowl, shorebirds and waterbirds migrating through the PLJV? Is residency period influenced by weather, food availability, or habitat quality?
- Basic waterbird ecology is needed for the region, with the exception of sandhill cranes.
- What is the importance of riparian areas to migrating wetland dependent birds?

#### ENERGY DEVELOPMENT IN THE GREAT PLAINS

- **What are the direct (e.g., mortality) and indirect (e.g., habitat availability) impacts of wind farms on birds in the PLJV region?**

- What are the proper set back/buffer distances for wind energy and solar developments from playas? Lesser prairie-chicken leks? Other grassland nesting birds?
- What are the cumulative impacts of alternative energy developments on the landscape?
- What are the potential habitat impacts from large-scale solar energy development?
  - What are the direct mortality impacts of solar developments? Are collisions a problem? Do birds that fly over these facilities experience heat stress? Do waterfowl and other birds mistake them for bodies of water?
- What are the direct and indirect effects of energy infrastructure on playa hydrology?

#### SALINE LAKES: Conservation and management

- What impact does removal of invasive species have on the hydrology of saline lakes, particularly, are springs able to return to function and how long does it take for springs to return?
- Turning off center pivots is a recommended action to restore hydrology to saline lakes. What are the priority center pivots? How long does it take to restore spring flows? At what distance are the effects still observed?
- What impact do invasive species have on the ability of wetlands to provide suitable breeding, wintering, or migrating habitat for birds? What do they replace and what depends on the displaced species?

#### HUMAN DIMENSIONS

- What are the economic/social factors that will influence the decision of farmers and ranchers to maintain or establish wildlife habitat (e.g. continue enrollment in CRP, enroll in various EQIP practices)?
- What information do landowners or the general public need to support public policies aimed at sustainable use and conservation of water?
- What are the economic/social impacts of producers signing up with a wind company to put towers on their property?
- How do/will changes in water availability – either through less rainfall, fewer but more intense rainfall events, or decreased output from the aquifer – impact farmer/rancher choices for farming/ranching techniques and enrollment in farm bill programs to protect wildlife habitat?

#### IMBCR: Questions and potential off-year studies (from Advisory Committee)

- Landbirds that are habitat specialists, we have little information on them and BBS and the IMBCR grids are not sampling them accurately. Design an off-year IMBCR study to focus on specialist habitats to inform landbird planning, these birds include: Rufous-crowned Sparrow, Prairie Falcon, Northern Rough-winged Swallow.
- Do wind farms negatively influence populations of native species of grassland birds in the plains?
- Does oil and gas development negatively influence populations of native species of grassland birds in the plains?
- Are CRP grasslands used by native species of grassland birds in the plains?

- Can we describe how shortgrass prairie birds use landscapes with an agricultural component?
- Can we expect to see portions of the Nebraska Sandhills and other areas in central Nebraska to see increased grazing production in the future?
- How do grassland birds respond to the playa restoration work we are doing with the Playa Conservation Initiative?
- Where can we get the most bang for our buck treating woody invasion at lower canopy levels for priority species of grassland birds?
- What are the optimal characteristics for riparian habitat roost sites selected by wild turkeys? Where are there good roost sites that are not currently inhabited by wild turkeys?
- Would targeted shrub planting benefit Scaled Quail in the shortgrass prairie? Where?
- Would shrub reduction in eastern New Mexico be beneficial to Northern Bobwhite? Where?
- Can we distinguish differences in abundance for wild turkeys associated with riparian areas with eastern cottonwood vs. Russian olive? Can we demonstrate a population response for wild turkeys associated with Russian olive removal?
- Can we develop some targeting tools for shortgrass prairie conservation in the Texas portion of BCR18, particularly the HP region?
- Can we develop some targeting tools for landowner outreach for grassland easements in Texas?
- Can we develop some targeting tools that can be used to guide Wildlife Management Area expansion and outreach in Texas?
- How can we target efforts surrounding existing conservation easement in the Smoky Hills to expand the conservation impact beyond the easement boundaries?