Playa Lakes Joint Venture
Playa Decision Support System

The Playa Decision Support System (PDSS) identifies playa wetland restoration and conservation priorities throughout the Playa Lakes region (Fig. 1). The PDSS includes both landscape-scale analysis that identifies priority clusters of playa wetlands that provide important habitat for migratory waterfowl and site-scale analysis that scores individual playas in terms of factors that reflect local ecological value. The site-scale model is designed with the goal of prioritizing least-impacted playas for conservation and playas already impacted by development for restoration by sediment reduction. The specific factors included in these prioritizations are determined by individual state working groups made up of local conservation partners. At the time of this report the PDSS has been completed in Kansas and New Mexico, and is in process in Texas and Nebraska, and is scheduled to begin in Oklahoma and Colorado in the latter half of 2013.

OVERVIEW

Lead developer(s): Playa Lakes Joint Venture (PLJV).[1]

Year developed: Initiated in 2010.[1]

Geographic area: The PDSS targets playa wetlands falling within PLJV's playa region (Fig. 1).

Resource types: Playa wetlands.[1]

Restoration/conservation: Restoration (reestablishment and rehabilitation), enhancement, preservation/protection.[1]

Stakeholders: PLJV and other organizations in the region involved with playa wetland restoration and conservation.[1]

Figure 1. The PDSS prioritized playas within PLJV's playa region. Used with permission of PLJV.

Current status: The PDSS is still under development.[1]

PRIORITIZATION ANALYSIS

Determination of prioritization objectives: The watershed/landscape needs addressed by the PDSS models are based on migratory bird conservation goals of the PLJV, such as avoiding conflict with wind development, in addition to the wetland preservation (projects under the North American Wetland Conservation Act) and water quality (Farm Bill programs) needs of regional wetland programs.[2]

Updated: 7/29/2013

Landscape prioritization tool(s):

Landscape-scale model: At a landscape scale, the PDSS prioritizes clusters of playas based on the number and area of playas distributed throughout the landscape. The model first delineates two types of playa clusters based on known relationships between dabbling duck abundance and playa density.[2]

- The first type of playa cluster contains multiple, densely distributed playas and was defined in the PDSS as an area containing more than 0.55 playas per square kilometer over an area with a radius of 2000m. Playa density measures used to delineate these areas are derived from spatial data for dabbling duck abundance, which were used to predict playa density based on the relationship shown in Figure 2A.[2]
- The second type of playa cluster is defined in the PDSS as an area containing 0.55% playa land cover over a 12.56-square kilometer circular area. Similarly to the first cluster type described above, the playa density measures used to delineate these clusters were predicted using dabbling duck abundance data based on the relationship shown in Figure 2B.[2]

Because of the importance of playa wetland clusters for migratory waterfowl, each of the clusters identified using this method represents a priority area in which to target wetland restoration and conservation for the benefit of migratory bird populations. The landscape-scale model prioritizes playa clusters based on their value to migratory waterfowl using the factors and data sources listed in Table 1.[2]

A

$$\log_e(y) = 1.49 + 0.24(3.27) + 0.55 \cdot \log_e(\text{playa density})$$

B

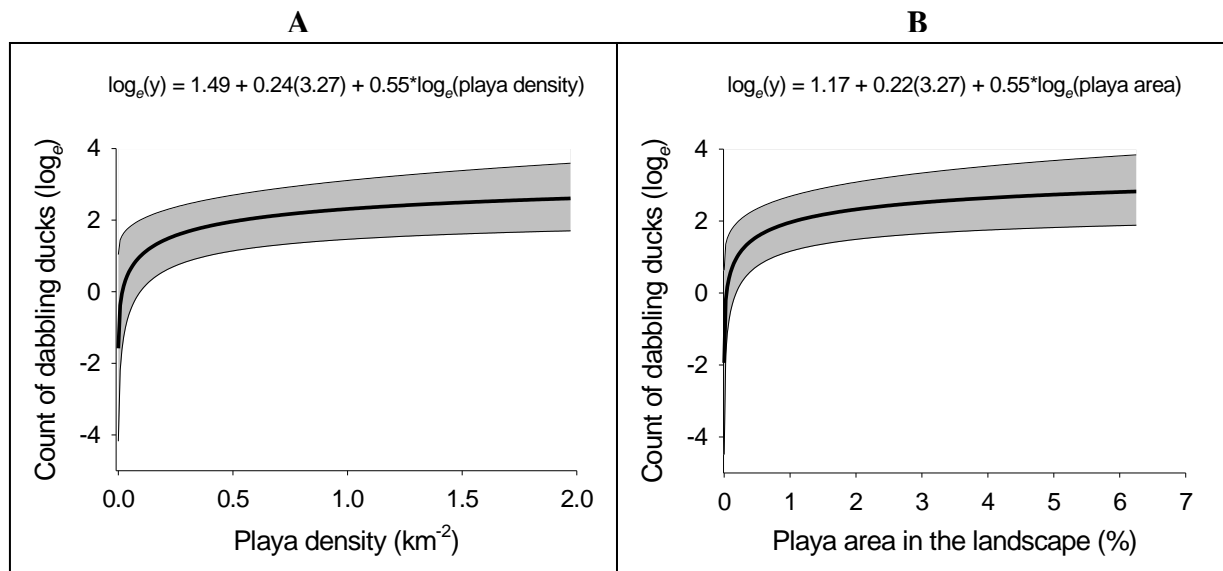$$\log_e(y) = 1.17 + 0.22(3.27) + 0.55 \cdot \log_e(\text{playa area})$$

Figure 2. Playa clusters are delineated in the model based on dabbling duck abundance data, which was used to infer playa density (A) and playa area in the landscape (B). Used with permission of Playa Lakes Joint Venture (PLJV).

Prioritization objectives assessed:[2]

- Habitat quality

Updated: 7/29/2013

Table 1. Factors and associated data sources used to identify priority playa clusters for waterfowl.[2]

Factor used in analysis	Data source(s)
Spatial distribution of waterfowl	RMBO dabbling duck observation locations
	Mid-winter waterfowl data from Texas

RMBO = Rocky Mountain Bird Observatory

Site-scale model: At the site scale, the PDSS prioritizes individual playas based on multiple factors used to assess ecological value. These factors are determined by individual state working groups and may include: dominant surrounding landcover, playa size, road impacts, habitat connectivity, or oil and gas development. Each factor is scored according to a set of criteria; for example, in evaluating a playa for the 'impacted by roads' factor, 100 points are assigned if it was located more than 50m from a road ("not impacted") and 50 points if it was less than 50m from a road ("impacted").[2]

Scores for each factor are then weighted based on the factor's importance relative to other factors. For instance, to prioritize playas for conservation, the dominant land cover factor is given greater weight than road impacts. After applying these weights to each factor score for each individual playa, the factor scores are added together and one of four overall prioritization scores, ranging from low to very high, is assigned to each playa.[2]

Prioritization objectives assessed:[2]
- Habitat quality
- Water quality

Prioritization products: Prioritization maps from the PDSS models are available to the public as static maps and GIS data[1] on their website at: http://www.pljv.org/playa-dss. Figure 3 shows an example map of Nebraska playa prioritized for buffer restoration.
An in-depth manual to the PDSS can be downloaded at:
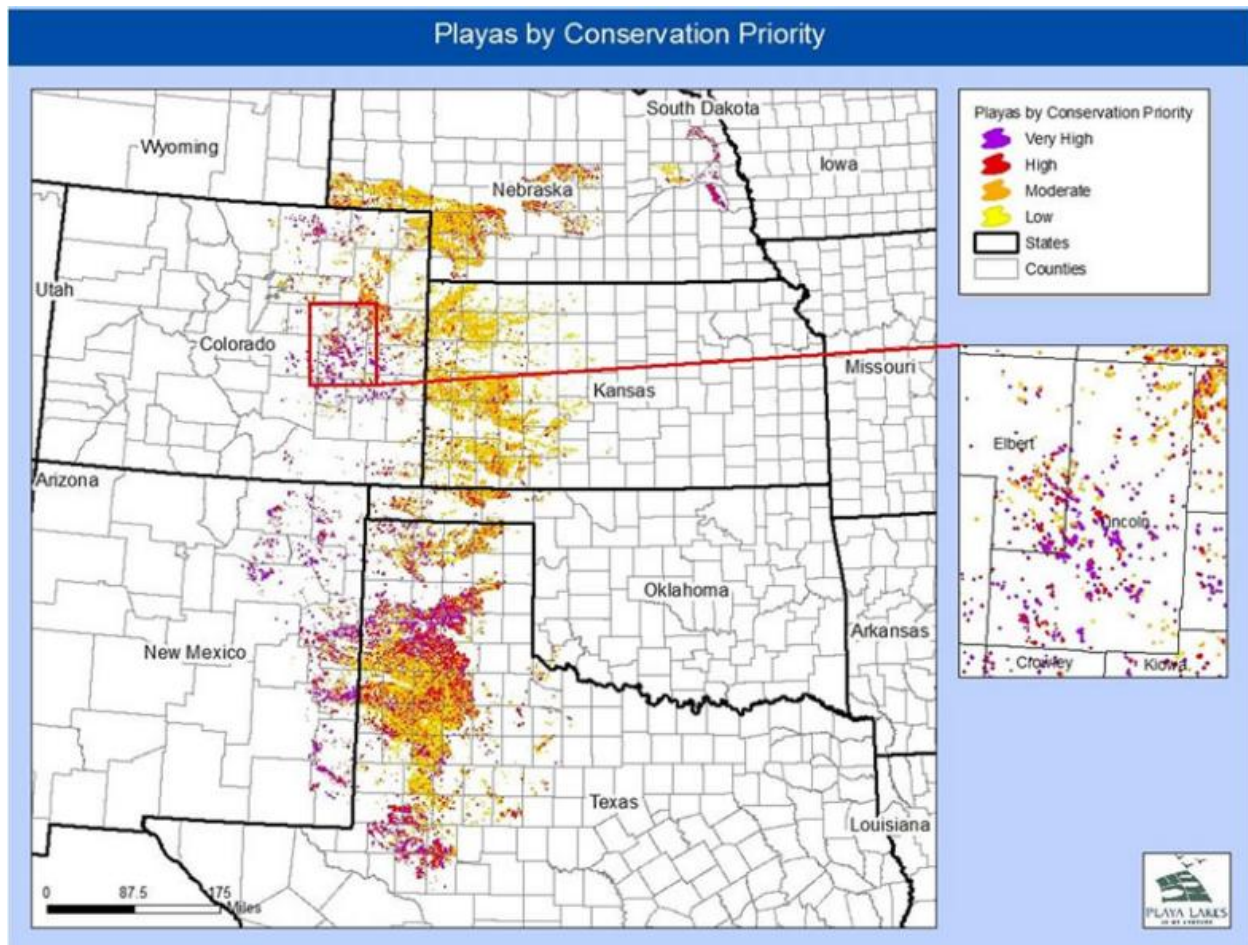http://www.pljv.org/pdss/Playa_DSS_Manual.pdf

Updated: 7/29/2013

Figure 3. Output from the Site Scale Tool for the PLJV study area. Used with permission of Playa Lakes Joint Venture (PLJV).

IMPLEMENTATION

Regulatory/non-regulatory programs:
- Land acquisition by conservation organizations.[1]
- Farm Bill programs (WRP, CRP): The PDSS model could be used to guide the selection of restoration and conservation projects to receive funding under the WRP and CRP programs. For example, in considering funding proposals for wetland projects, the WRP program could award additional points to those located in PDSS priority sites.[1]
- NAWCA grant program: The model could inform the selection of projects to receive NAWCA funding. Priority sites for restoration or conservation could be incentivized for funding by the NAWCA grant program.[1]

Transferability:
- The PDSS model is not directly transferable to states without playa lakes (Fig. 1). Though the prioritization methods used could easily be adapted to other conservation or restoration objectives.

Data gaps:

Updated: 7/29/2013

- Higher quality LiDAR data: Elevation data are poor quality because terrain within the playa region is very shallow.[1]
- Updated National Wetlands Inventory (NWI) data: An improved NWI dataset could allow playa locations to more accurately be identified in the PDSS site-scale.[1]
- Land cover data: Features could be more accurately and consistently classified with improved land cover data in the PDSS site-scale model.[1]
- Playa functionality data: Although many playas have been mapped, information on function is lacking– e.g., many have likely been filled by agricultural practices, etc.[1]

Barriers:
- Time available to work on the PDSS model. While prioritization products are currently in high demand, development of the tool has been limited by time constraints.[1]

Future goals:
- Within five years, PLJV hopes that development of the PDSS model will be complete and that the tool will have been applied to help achieve the goals of preserving least-impacted playas, avoiding waterfowl migration conflicts with development, and reducing sediment entering impacted playas. To achieve this goal, PLJV expects that several iterations of the project will be needed given the extent of current data gaps. For example, as land cover data improve, priorities identified by the model will change, leading to further changes in other aspects of the process.[1]

---

[1] Interview on 1/3/2012 with Deb Baker, Kansas Water Office, and Ty Guthrie, Megan McLachlan, and Bob McCready, Playa Lakes Joint Venture.
[2] PLJV PowerPoint presentation and notes for the PDSS.

Updated: 7/29/2013