AR MAV CDN Delivery Priority Tool 2017

The Delivery Priority Working Group of the AR MAV CDN is pleased to announce the successful completion of the revision and re-release of its Conservation Delivery Priority Tool. This new version replaces the 2012 version and has been approved by the CDN Steering Committee as a tool appropriate for prioritizing conservation actions and projects within the CDN. With this revision, the Working Group once again utilized the best available landscape design data that collectively consider multiple priorities for restoration and protection of bottomland hardwood forests in the AR Delta. The 2017 version of the Tool has been separated into two distinct conservation categories – restoration and protection – in ***two unique priority maps*** (See Figures 1 & 2) – in order to strengthen and balance the information more effectively. Only the upper half of the models' priorities are presented as CDN priorities, so that only the highest of the high priorities are targeted when using this tool.

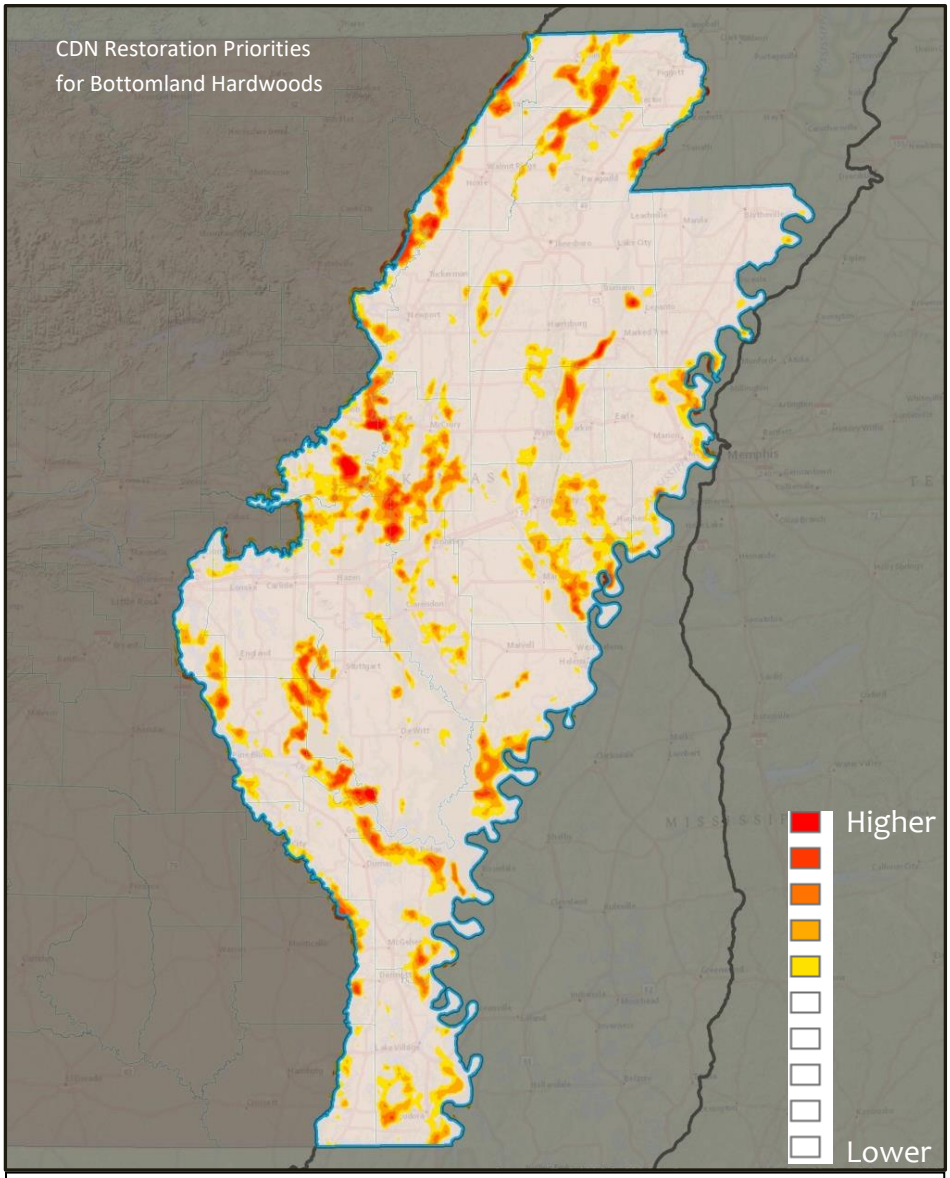

Figure 1. The Restoration Priority Map for the AR MAV CDN. Presented June 2017.

The Tool revision incorporates both updated data and newly revised data in this dual model approach. It also utilizes designated 4w+ soils to inform data model inputs.

Although data inputs are widely considered the highest resolution data (30m x 30m pixels) of their type available and fully consistent with landscape level conservation uses, the output models are presented in the form of priority clusters or neighborhoods, produced through focal neighborhood GIS analysis. Since conservation activities do not typically occur at such small scales as 900 meters[2] (or less than one-quarter acre), utilizing neighborhood analysis is helpful for finding where high priority pixels are more densely associated, and better serves the identification of priority areas as opposed to individual priority pixels. In some cases, conservation objectives for a given location will include both protection and restoration, but by separating these in the Tool, they may be considered as separate activities, as appropriate. Therefore, the Protection model should be viewed as targeting forested lands not currently protected, whereas the Restoration model is focused on lands that are no longer forested, but are appropriate for restoration.

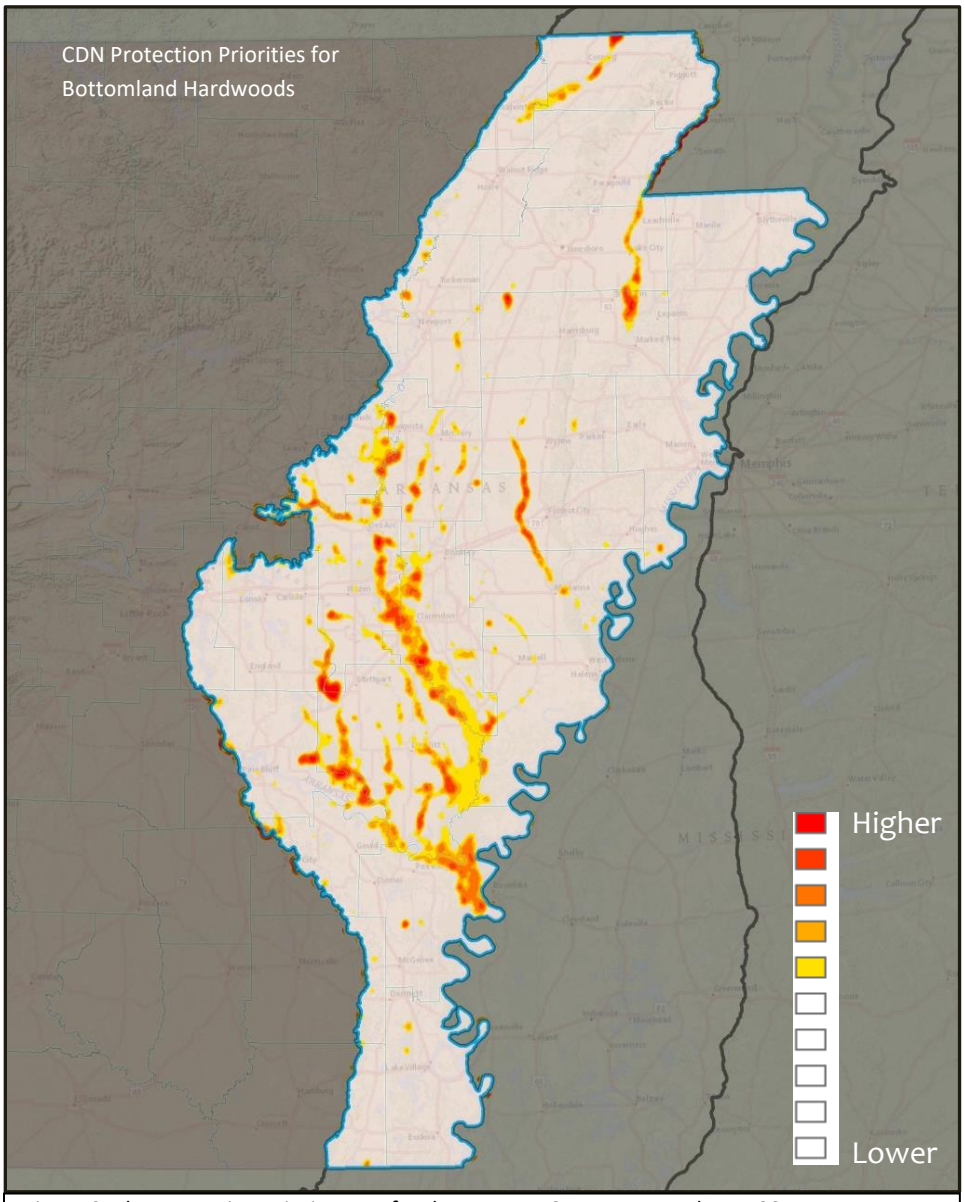

Figure 2. The Protection Priority Map for the AR MAV CDN. Presented June 2017.

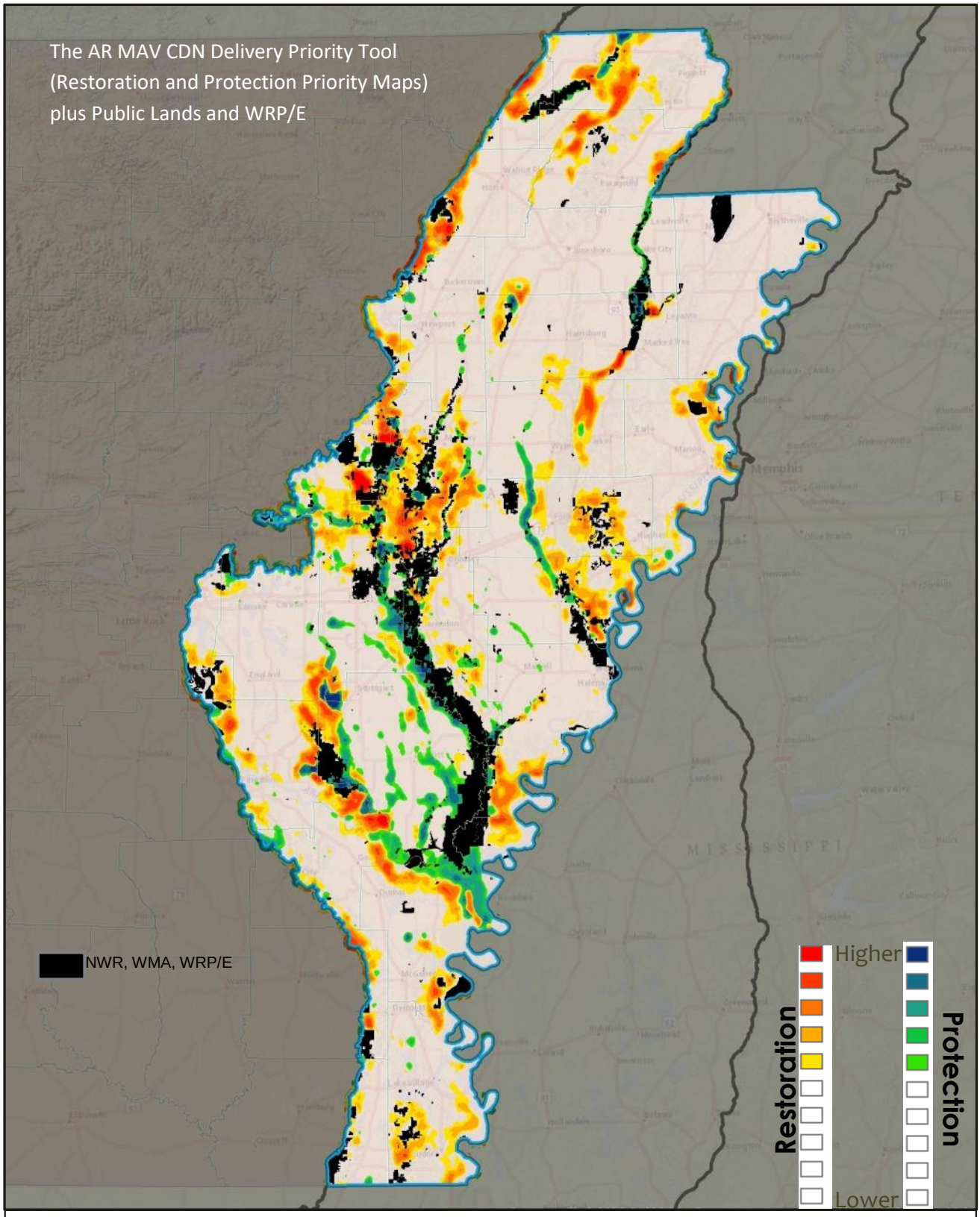

Figure 4. The Protection and Priority Maps of the AR MAV CDN overlaid for perspective, plus conservation estate lands.

Methodology and Data Model Inputs

To develop this Delivery Priority Tool approach, Delivery Planning Working Group assessed and evaluated several potential data sets for inclusion, and settled on the data discussed below and detailed in the section following. These data represent respected, peer-reviewed, scientifically-based information developed by partnering agencies focused on conservation in the MAV. Two of the chosen models were principally reforestation models while two others are focused on habitat protection.

The two protection models were weighted equitably, combined, normalized and then neighborhood analysis was employed to help locate areas of greater priority overlap. The same process was applied in developing the restoration models. This approach allows the CDN to capitalize on existing wetland and reforestation planning models to, in essence, "prioritize the priorities". These tools allow CDN partners the opportunity to work cooperatively in areas where their organization's conservation priorities and objectives jointly overlap existing conservation priority layers (i.e. areas in which a specific agency has already indicated they prefer to work based on organizational mission).

The Working Group ultimately settled on the following spatially-explicit conservation decision support models– 1) Ducks Unlimited's Wetland Restoration Suitability Model, 2) the Forest Breeding Bird Reforestation Decision Support Model that was developed by the LMVJV Partnership, 3) Ducks Unlimited's Land Protection Prioritization Model and the 4) the Arkansas Multi-Agency Wetlands Planning Team Priority Model. Development methods of each model is fully documented (for abstract information on each model, please see the section to follow) and has been rigorously peer-reviewed, making our conservation decision more supportable and justifiable. Hydric Soils (4+w Soils) are also incorporated to highlight existing priorities.

By utilizing these data sources, we take advantage of quality science and decision-support capabilities developed individually and collectively by a large number of CDN partners, and do so in a way that selects the highest priority areas from each decision support system. This allows the CDN's focused management activities to be targeted to areas where they will have the greatest impact for wetland conservation. This approach also utilizes a more developed and defensible methodology than simply having experts subjectively identify circles on a map. The Tool not only puts critical decision support information into the hands of conservation professionals most aptly capable of best it, but also places the partnership in the position of being uniquely qualified to respond to grant-funding opportunities.

SITE SUITABILITY MODELING FOR THE RESTORATION OF FORESTED WETLANDS IN THE MISSISSIPPI ALLUVIAL VALLEY

Stacey Shankle, Dawn Browne, Jerry Holden Jr.

Ducks Unlimited, Inc. Southern Regional Office

Ducks Unlimited, Inc. (DU) has constructed a reforestation priority model for identifying optimal sites for restoration of forested wetlands in the region. The model facilitates intelligent analysis of multiple, regional datasets critical to determining site suitability in the MAV, including: a Soil Moisture Index (DU), Natural Flood Frequency (DU), a 1973-2001 Forest Loss dataset (DU), Sinks/Depressional Areas (DU derived from USGS National Elevation Dataset (NED)), and graduated stream buffers by stream order (DU derived from USGS/USEPA National Hydrography Dataset). The output of the restoration priority model will assist with directing the future reforestation efforts of multiple parties to the most appropriate locations throughout the MAV.

FOREST BREEDING BIRD REFORESTATION DECISION SUPPORT MODEL

Mike Mitchell

Ducks Unlimited / Lower MS Valley Joint Venture Office

Historic forest cover in the Mississippi Alluvial Valley has been reduced by >75%. Remaining forests are fragmented, hydrologically altered, and heavily influenced by human activities. Because well drained forests were easily cleared, most remaining large forest fragments are wet forest types. Because forest fragmentation and altered hydrology have negatively affected forest bird populations, we developed a spatially explicit decision support model for bird conservation. The general premise of the Lower Mississippi Valley Joint Venture's landbird planning for the Mississippi Alluvial Valley (MAV; Bird Conservation Region 26) is to utilize existing forest patches to support "source population" objectives of priority breeding birds. Source populations are defined as "populations of bird species that are self-sustaining with sufficient territorial individuals for enhanced pair bonding".

This model establishes priority areas for forest restoration that de-fragment the existing bottomland hardwood forests. Our primary objective was to increase the number of forest patches that harbored >2000 ha of interior area (core) that is at least 1 km from a hostile edge. We also sought to increase the number of forest cores that were >5000 ha and to add additional forest core to larger contiguous forest areas. Forest restoration was targeted to achieve at least 60% forest cover within local (10 km) landscapes. Finally, within priorities that defragment forest cover, we emphasized restoration of high-site (well-drained) bottomland hardwood forests.

MAV LAND PROTECTION PRIORITIZATION MODEL

Ducks Unlimited, Inc. Southern Regional Office

The Mississippi Alluvial Valley (MAV) once consisted of approximately 24 million acres of forested wetlands. Much of this area flooded each winter and provided an abundance of foraging and resting habitat for migrating and wintering waterfowl, especially mallards and wood ducks. Natural foods including oak mast, moist soil plants and invertebrates provide an abundant source of energy and nutrients for migrating and wintering waterfowl and many other species of wildlife. Today around 5.1 million acres of these forested wetlands remain, many of which have suffered extensive alterations of hydrology and all of which are highly fragmented. Use of these forested wetlands by waterfowl, in particular mid-continent mallards, is probably associated with abundance of invertebrates and mast and the need for females to increase protein intake prior to initiating breeding activities. In addition, these woody wetlands provide suitable cover for increased pairing activities that occur during late winter and spring migration. Therefore, the quantity, quality and availability of food resources and resting sites such as provided by flooded bottomland hardwood forests may limit the ability of the MAV landscape to support migrating and wintering waterfowl.

Early efforts at protecting the remaining forested wetlands in the MAV were accomplished through land acquisitions by public agencies including state natural resource departments and the U.S. Fish and Wildlife Service; however, much of the remaining tracts reside in private ownership and may never be available for public acquisition. As an alternative to fee title acquisition of parcels, conservation easements (donated or purchased) provide a useful tool that allows conservation partners in the MAV to perpetually protect these important forested wetland habitats.

As such, the *MAV Land Protection Prioritization Model* was designed as a tool to aid in identification of forested wetland tracts to target for perpetual protection via conservation easements (servitudes). Conservation design behind this modeling effort is to build on those existing forested wetlands within close proximity to private and public lands already under some degree of protection either by ownership (state or federal lands) or legal agreement (conservation easement, e.g. Wetlands America Trust, Wetland Reserve Program) thus effectively creating a protected area network of waterfowl habitat. Therefore, strategically placing conservation easements near large public land areas may provide maximum conservation return. In addition, it is intended that the use of the prioritization output in concert with the LMVJV private landowner parcel database will facilitate a more proactive conservation easement strategy within the Lower Mississippi River and Tributaries landscape conservation priority region.

AR WETLAND PLANNING TOOL

ARKANSAS MULTI-AGENCY WETLAND PLANNING TEAM (MAWPT)

Most of the wetlands in Arkansas are palustrine forested, scrub-shrub, and non-vegetated wetlands. The most extensive areas of wetlands in the state lie along the major rivers, such as the lower Mississippi, Arkansas, Red, White, and Little Rivers and their principal tributaries in the Mississippi Alluvial Plain, South Central Plains, and

Arkansas Valley Ecoregions. Other wetlands are scattered throughout the State and are associated with springs and seeps in the Ouachita Mountains and Ozark Highlands.

The MAWPT wetland prioritization tool relies on a raster calculator approach in ArcGIS to combine data layers representing prioritization objectives to determine areas that represent wetland restoration or protection priorities. Data factors selected by the MAWPT are overlaid to create wetland inventory maps that rank areas for wetland protection or restoration. This process may prioritize wetland restoration and protection opportunities in the forested (riparian) corridor along the main streams of the watershed to address water quality or habitat objectives. In addition, the MAWPT may also seek to prioritize habitat connectivity along riparian corridors by promoting "large, connected block[s] of bottomland habitat that [are] of high value to species population viability." Thus, the tool can be considered a restoration and protection decision support model.