LA MS
MAV
CDN

LA/MS MAV CDN Delivery Priority Tool 2019

Lower Mississippi Valley
JOINT VENTURE
www.lmvjv.org

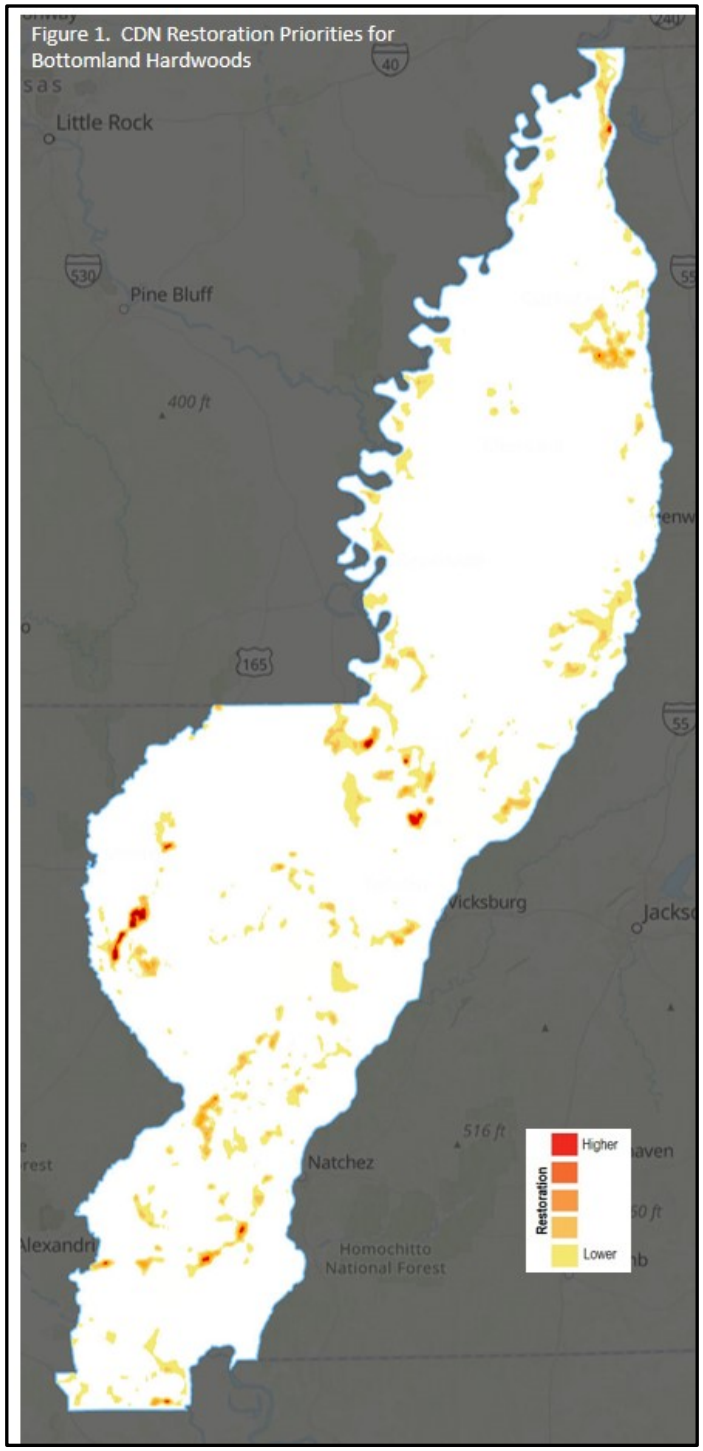

Figure 1. CDN Restoration Priorities for Bottomland Hardwoods

The Delivery Priority Tool Working Group (WG) of the LA/MS MAV CDN has recently completed a significant revision of its Conservation Delivery Priority Tool (DPT). The newly revised version replaces the original from 2013 and has been further refined and designed as a tool for planning and prioritizing conservation actions and projects within the CDN.

With this revision, the WG has again utilized the best available landscape design data that collectively consider multiple priorities for restoration and protection of bottomland hardwood forests within the CDN's Mississippi Alluvial Valley (MAV) region. Different than 2013 however, the 2019 version is separated into distinct conservation categories – Restoration and Protection – and presented as ***two unique priority maps*** (Figures 1 & 2). This two map approach is intended to more effectively strengthen and balance the usefulness of the information in support of conservation planning. Only the upper half of the Tool's prioritized values are represented, and serve to assist in targeting conservation actions in highest priority areas.

The DPT revision incorporates both updated data and newly revised data in this dual modeling approach. The incorporated data models include: recently updated 2011 MAV Forest Breeding Bird Decision Support Model (Lower

MS Valley Joint Venture, 2015), newly updated DU MAV Land Protection Model (2015), DU Wetland Restoration Suitability Model, and newly created MAV Forest Protection Model (Lower MS Valley Joint Venture, 2019). Although inputs used in the revision are generally considered the highest resolution data (30m x 30m pixels) available, and fully consistent with landscape level conservation uses, final outputs are actually presented in the form of priority clusters or neighborhoods, produced through GIS focal neighborhood analysis. Since conservation activities do not typically occur at scales as small 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. Thus, the approach better assists in identifying priority areas where conservation actions might be focused as oppose to working with or attempting to target priority pixels.

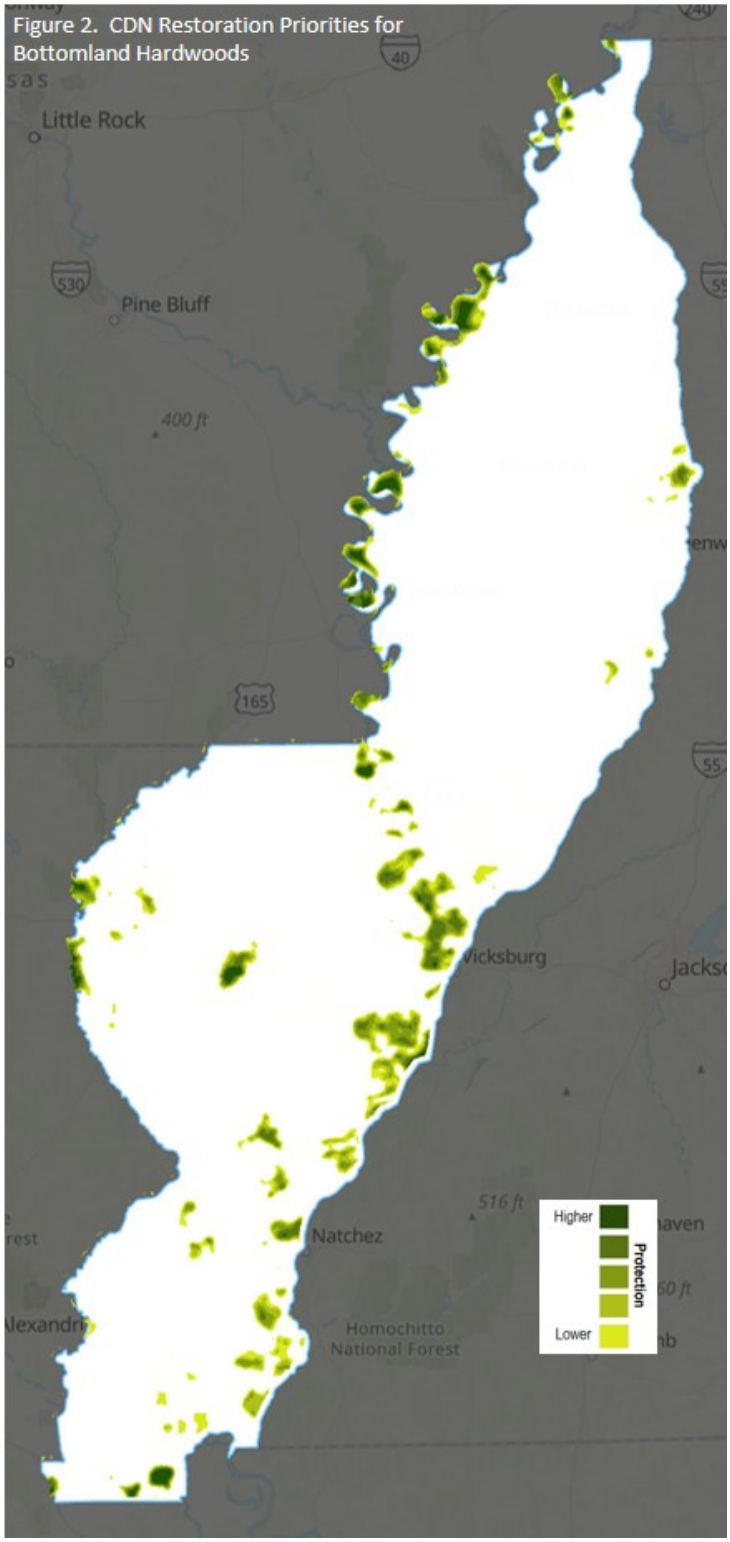

Figure 2. CDN Restoration Priorities for Bottomland Hardwoods

Additionally, Figures 3 & 4 (with Fig. 4 including the conservation estate) represent the combined restoration and protection maps. The combined map fundamentally comprises the CDN DPT as a whole, and it can be used effectively in this format where conservation planning includes shared protection and restoration objectives. However, by also separating these maps within the DPT they can be better utilized when addressing or planning for more distinct conservation priorities. Further, users of the Protection only portion of the DPT (Figure 2) should be aware that it is specifically designed to target forested lands not currently protected. Alternatively, the Restoration only portion of the DPT (Figure 1) is focused on lands that are no longer forested, and are represented as most appropriate for restoration.

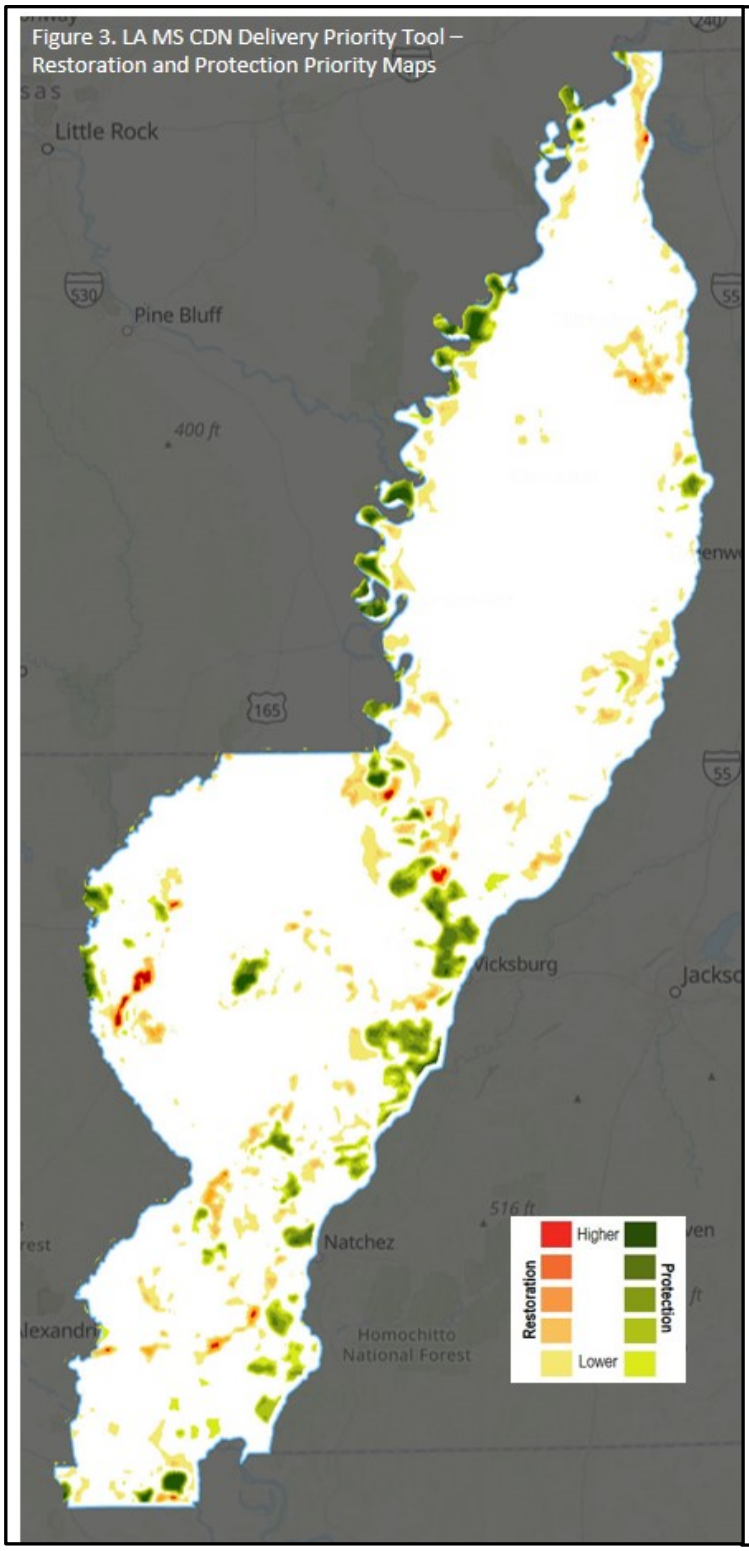

Figure 3. LA MS CDN Delivery Priority Tool – Restoration and Protection Priority Maps

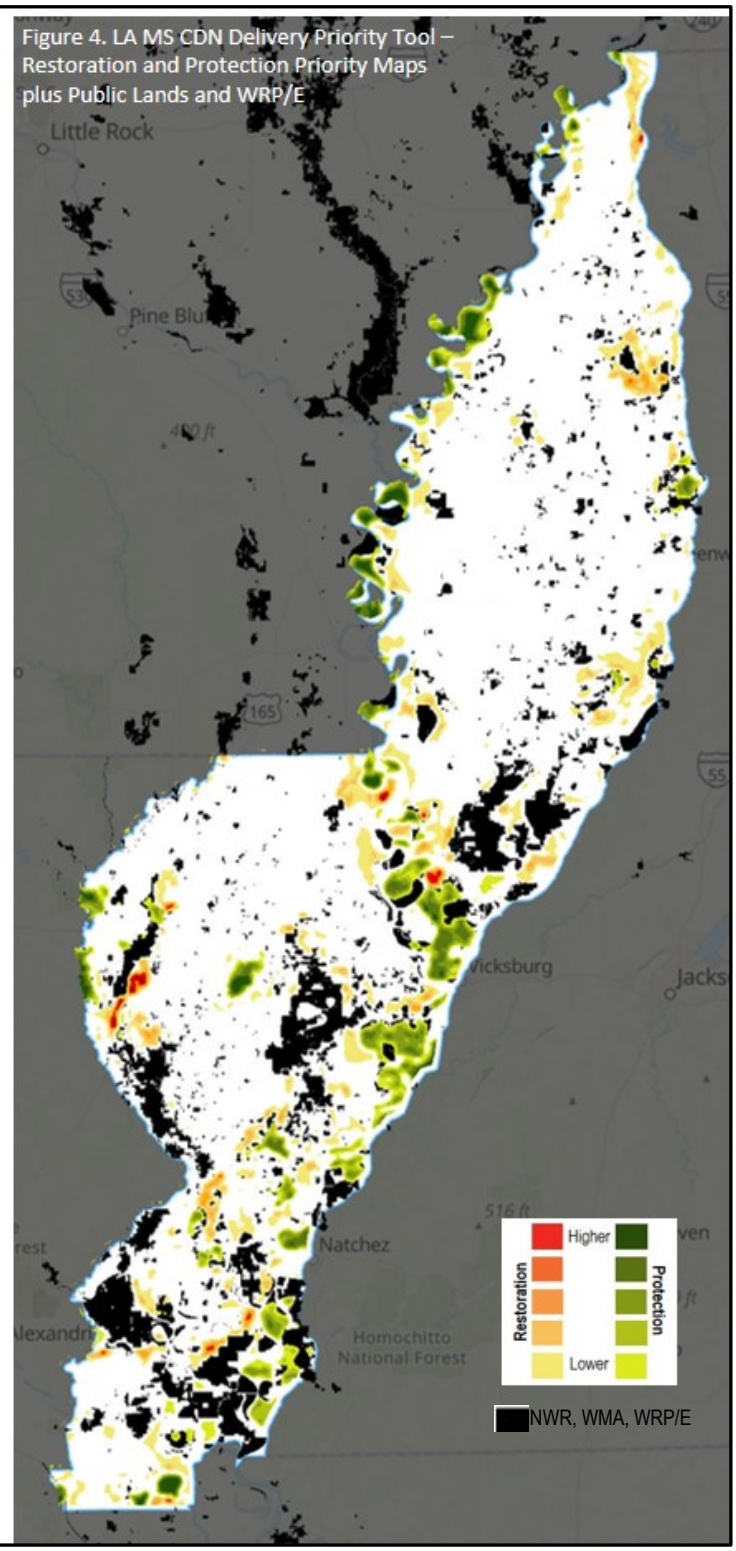

Figure 4. LA MS CDN Delivery Priority Tool – Restoration and Protection Priority Maps plus Public Lands and WRP/E

A detailed description of each DPT input model is included below. The methodology used to create the DPT is available by contacting Blaine Elliott, Lower MS Valley Joint Venture, blaine_elliott@fws.gov.

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

(wetland_restoration_suitability model)

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 RESTORATION DECISION SUPPORT MODEL

Mike Mitchell
Ducks Unlimited / Lower MS Valley Joint Venture Office

(forest_bird_restoration_DSM)

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 PRIORITY MODEL

Ducks Unlimited, Inc.
Southern Regional Office
(easement_priority_model)

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.

MAV FOREST PROTECTION DECISION SUPPORT MODEL

Blaine Elliott and Anne Mini
Lower Mississippi Valley Joint Venture
(forest_protection_model)

Clearing forest for agricultural production in the Mississippi Alluvial Valley (MAV) has markedly decreased the extent of forest habitat (Mitchell et al. 2016). To provide critical forest habitat for the conservation of migratory birds and other wildlife, reforestation (afforestation) is a principal tool that conservation delivery professionals use in this region to restore former forests. The Lower Mississippi Valley Joint Venture (LMVJV) partnership has promoted reforestation in the MAV for almost two decades, as evidenced by Forest Breeding-Bird Decision Support Model (FBBDSM). However, the protection of extant forest on which the decision support model was based has not been addressed. Loss of extant forest would negatively impact species using these intact habitats. Moreover, such loss would also adversely affect the accuracy and effectiveness of the FBBDSM. Therefore, the LMVJV partnership is seeking to facilitate the strategic protection of existing forest blocks, specifically for forest-breeding birds in the MAV, through a "Forest Protection Decision Support Model".

Biological Underpinnings – We based our Forest Protection Decision Support Model (FPDSM) largely upon the biological assumptions used to develop the FBBDSM, particularly in regard to size (acreage) of forest patches and forest core. The FBBDSM's primary purpose is to encourage placement of reforestation in such a way as to increase forest core (i.e., sufficiently buffered interior forest) habitat to achieve forest patches that contain habitat consistent with the needs of priority bird species. It is believed that these forest core buffers diminish the deleterious effects of nest depredation and cowbird brood parasitism. The FBBDSM also provides increased valuation to higher elevation sites within reforestation priority zones, as these are important for ground-nesting priority bird species.

Forest Protection DSM – We wanted the FPDSM to provide guidance as to each forest patch's contribution to forest bird conservation in the MAV relative to its current level of protection and its landscape context, using the understanding and information gleaned from the newly refined FBBDSM as our framework. Therefore, we sought to evaluate the level of protection on forest patches that contained sufficient core forest (and forest patches that fell just shy of containing sufficient core), forest patches that were adjacent to the highest priority FBBDSM reforestation zones, and forest patches that were less prone to flooding and use this to provide a prioritized protection model.