DUCKS UNLIMITED

# MISSISSIPPI RIVER
## RESILIENCE PROGRAM

# ABOUT DUCKS UNLIMITED

Ducks Unlimited (DU) is the world's leader in wetlands conservation. Our teams bring together deep expertise in biology, agriculture, sustainability, engineering, land protection, and ecological restoration–delivering conservation that's grounded in science and built for scale.

We are uniquely equipped to manage every aspect of a project, from planning and permitting to implementation and monitoring, delivering fully integrated, turnkey solutions across the Mississippi River Basin. The outcomes extend far beyond habitat: **restoring ecological function, supporting sustainable infrastructure, strengthening supply-chain resilience, and fueling economic growth.**

From federal agencies to small-town mayors, global corporations to local businesses, our partnerships reflect the river's reach and help accelerate impact. And behind it all, a grassroots network of nearly one million volunteers and supporters drive conservation forward from the headwaters to the delta.

THE WALL STREET JOURNAL

**As Mississippi River Flooding Gets Worse, 100 Mayors Try a New Fix**

River cities partner with hunting group and others to store water in natural areas, potentially reducing by 10% the chances of a levee overtopping

Millions of residents along the Mississippi River are facing a future of more frequent and severe flooding. Intense rainfall events threaten the livelihoods and economies of communities along the river. A 2021 Wall Street Journal article features Ducks Unlimited's work to mitigate those threats with a smart solution: more wetlands. DU has partnered with the Mississippi River Cities and Towns Initiative (MRCTI) to restore more wetlands that will soak up floodwater while providing habitat for waterfowl. The Journal featured DU scientists, biologists, and engineers working along the Mississippi River in conjunction with MRCTI.

## DRIVING IMPACT THROUGH PARTNERSHIPS

Ducks Unlimited has spent nearly a century forging cross-sector partnerships to deliver practical, science-based solutions at scale with state or federal agencies, private industries, agricultural producers, municipalities, corporations, nonprofits, and private landowners. Our partnership model helps us leverage our supporters' hard-earned dollars with funds from myriad sources and maximizes different capabilities and talents to achieve truly exceptional results.

Built on trust, technical expertise, and voluntary collaboration, DU's approach helps partners translate conservation goals into lasting, on-the-ground outcomes. Whether we are restoring fish and wildlife habitat on publicly owned lands, co-designing natural infrastructure with municipalities to address flooding or working hand-in-hand with farmers, our success depends on relationships – especially in the basin where over 80% of the land is privately owned and much of it is in agricultural production.

# WHY THE MISSISSIPPI RIVER?

The Mississippi River has quietly shaped life across the U.S. for centuries. Early explorers trusted its currents, letting the river carry them westward into uncharted territory where settlements rose along its banks. First steamboats and then barges transformed it into a thriving artery of commerce, fueling economies and connecting distant cities. For generations, the river has been a backdrop to life, a source of inspiration for writers and musicians, and a foundation for cultures that have flourished along its banks. Before the widespread development and agricultural expansion of the 19th century, the Mississippi River was a landscape of wetlands. Two centuries later, only half of those wetlands remain. It is one of the most important waterways in the world. **But today, it is also one of the most threatened**.

The natural defenses that once shaped the river's resilience—its wetlands, prairies, and floodplains—have been slowly stripped away by decades of land conversion and increasingly volatile weather. The system is under stress. Floods are more destructive, water is less clean, and habitat continues to vanish. The very landscapes that buffered the river for centuries can no longer absorb, filter, or sustain it. And the communities that depend on the river are left more vulnerable every year. **Since 1937, Ducks Unlimited has worked to reverse that trajectory, protecting the lands that give the Mississippi River Basin life – from the wind-swept prairies of its northern headwaters to the intricate coastal marshes of the southern delta.**

We have long recognized that our conservation activities provide extensive benefits for people, including improved water quality and availability, decreased nutrient runoff, increased flood storage, stable agricultural production and transportation, and access to new and improved recreation opportunities. **Ducks Unlimited's Mississippi River Resilience Program (MRRP) is a holistic conservation delivery program connecting conservation work from the headwaters of the river through the tributaries, mainstem, and delta to provide clean and abundant water, safe and prosperous communities, healthy wildlife and ample outdoor recreation opportunities.**

DU has set an ambitious goal: **to deliver 1 million acres of conservation each year** while maintaining our incredible efficiency rating – **a minimum of 80% of all funding goes to mission delivery**. Since 1984, DU has conserved over 7.5 million acres in the Mississippi River Basin alone, **increasing our impact in the basin by an average of 12% annually** over the past decade. **Our goal is to maintain or accelerate this trajectory in the years ahead.**

# NATURE-BASED SOLUTIONS FOR THE RIVER'S CHALLENGES

The Mississippi River is facing significant challenges. Once home to expansive wetlands, grasslands and forests, nearly **32 million acres of wetlands in the basin have been drained. Ninety percent of the river's historic mainstem floodplain is now disconnected by levees. Over two million acres of grass are lost in the basin every year and nearly 80% of the original bottomland hardwood forest is gone**. Loss of native habitat has significant consequences. Flooding is more frequent and destructive, water quality is declining, and critical habitat for waterfowl, fish, and hundreds of other species is shrinking. Across the basin, communities are bearing the cost: damaged homes and farmland, strained water systems, and livelihoods tied to the land pushed to the edge. The river's challenges are complex. But the solutions are already underway.

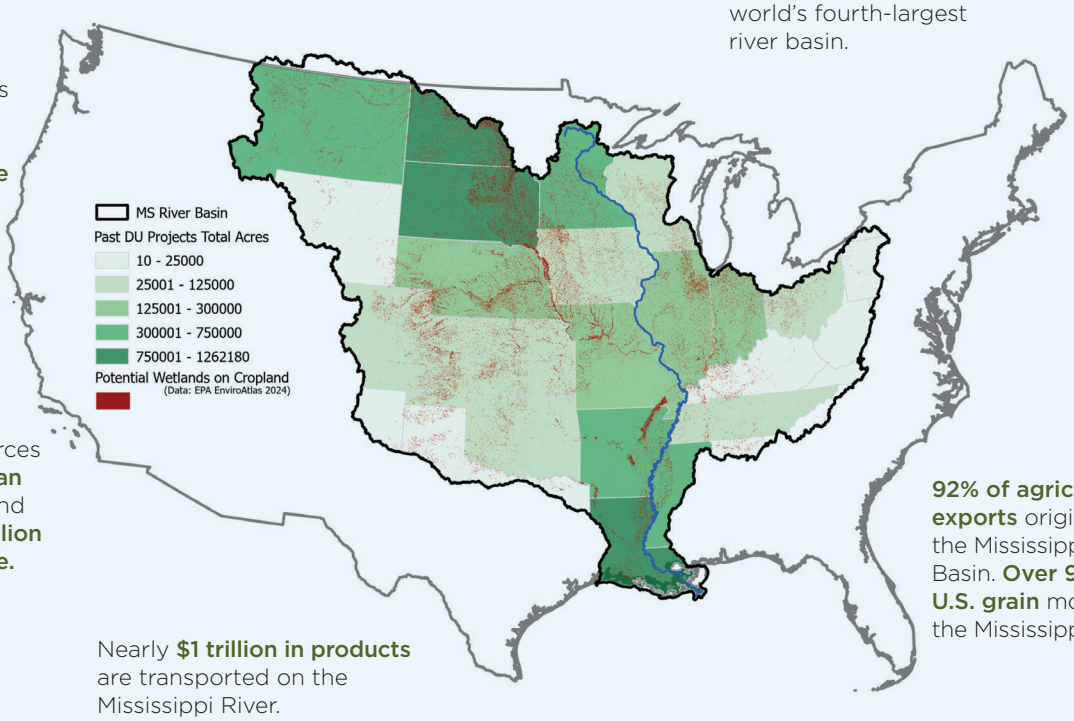
**Ducks Unlimited delivers nature-based solutions that meet the moment**. The conservation of wetlands, forests, grasslands, and working lands offers a practical solution to address some of these challenges. Read on to learn more about the challenges facing the Mississippi River Basin and the solutions that protecting and restoring nature can provide.

More than **60 billion gallons** of freshwater are withdrawn from the river daily.

**90% of all waterfowl** in the U.S. depend on the Mississippi River Basin.

The Mississippi River Basin spans **1.245 million square miles** and is the world's fourth-largest river basin.

The river provides drinking water to more than **20 million people in 50 cities.**




The river's resources support **more than 1.5 million jobs** and create **$496.7 billion in annual revenue.**

**92% of agricultural exports** originate from the Mississippi River Basin. **Over 90% of all U.S. grain** moves on the Mississippi River.

Nearly **$1 trillion in products** are transported on the Mississippi River.

The Mississippi River Basin's areas of drained wetlands and DU's historical conservation delivery of more than 7.5 million acres within the basin

## Flood Risk

**The Challenge:** Flooding isn't just a local disaster. It's a direct threat to businesses, supply chains, and economic stability. Major floods disrupt transportation, manufacturing, and agricultural production, causing long-term infrastructure damage and billions in losses. In 2019 alone, flooding along the mainstem river left communities under water for 100 days, resulting in $20 billion in economic damage (NOAA, 2020). As weather volatility increases, events like these are becoming more common and more costly.

**The Solution:** DU works with partners to reconnect floodplains, restore wetlands, and implement large-scale water management strategies. Wetland and floodplain restoration offers a proven, cost-effective defense against extreme flooding. These natural systems absorb, slow, and store floodwater, reducing the severity and duration of flood events and lowering risks to communities, infrastructure, and ecosystems. We also offer partnerships for voluntary programs that help landowners move valuable infrastructure out of frequently flooded areas.

## Nutrient Pollution

**The Challenge:** Nutrient pollution threatens public health, local economies, and drinking water supplies for nearly two-thirds of mainstem river communities. Excess nitrogen and phosphorus from agricultural runoff, wastewater, and urban sources increase treatment costs for utilities, pose health risks to humans, pets, and livestock, and degrade drinking water quality for millions of people across the basin. This pollution also fuels harmful algal blooms, depleting oxygen levels and contributing to the dead zone at the mouth of the river, which has encompassed almost 6,000 square miles – roughly the size of Connecticut (NOAA, 2024).

**The Solution:** Restoring wetlands in key flow paths, planting buffers along streams, and working with producers to implement practices like cover crops and precision nutrient management help reduce nutrient runoff before it enters the river. These layered, site-specific strategies help clean the water, reduce treatment burdens for downstream utilities, and create healthier soil and habitat along the way.

## Groundwater Depletion

**The Challenge:** Despite the Mississippi River's size and frequent flooding, groundwater depletion is a growing crisis across the basin. Intensive water withdrawals are rapidly reducing underground reserves, particularly in the Lower Mississippi River region, where groundwater levels are declining at some of the fastest rates in the country (Dash et al., 2024). This depletion threatens drinking water supplies, irrigation for crops, and the long-term health of wetlands and other aquatic ecosystems.

**The Solution:** We can mitigate groundwater depletion through strategic conservation and sustainable water management. DU collaborates with landowners and farmers across the basin to implement sustainable water management practices, such as irrigation efficiency technology and conjunctive surface water use and reuse. In certain geographies, the restoration of wetlands enhances floodplains and other natural systems that help recharge aquifers and slow groundwater loss.

## Native Habitat and Biodiversity Loss

**The Challenge:** Biodiversity across the entire basin is under pressure from habitat conversion, invasive species, and altered water flows that diminish native plant and animal populations. Freshwater mussels are a prime example of how biodiversity loss leads to further degradation of this ecosystem. Once plentiful in the river, they act as the river's liver and filter the water, removing harmful algae and reducing turbidity. Unfortunately, due to habitat loss, overexploitation, pollution, and invasive species, over 66% of freshwater mussels are at risk, reducing water quality up and down the river (USGS, 2020).

**The Solution:** DU works across the basin to restore, reconnect, and protect native habitats that form the backbone of biodiversity. Wetland restoration, water-level management, and sediment reduction strategies are tailored to sustain the full range of native species, from migratory waterfowl to aquatic plants and riverine fish. Across the basin, DU collaborates with partners to reverse habitat loss by restoring ecological functions that support native wildlife, preserving the integrity of the entire river system as a refuge for biodiversity and a resource for future generations.

## Outdoor Recreation Access and Tourism

**The Challenge:** Outdoor recreation is a cornerstone of the Mississippi River Basin's identity and economy, generating billions in revenue and supporting local jobs through hunting, fishing, wildlife watching, paddling, and tourism. But degraded habitats, water pollution, and limited access to public lands and the river itself are threatening the quality and availability of outdoor experiences. In the Lower Mississippi River region alone, outdoor recreation and tourism generate nearly $17 billion in annual spending and support nearly 250,000 jobs – a major economic engine now at risk (LMRCC, 2020).

**The Solution:** Protecting and restoring ecosystems in the basin is a direct investment in outdoor recreation and rural economies. DU works alongside public agencies, communities, and private landowners to conserve habitats that support hunting, fishing, wildlife viewing, and water-based recreation. Where practical, we invest in making these lands more accessible to the public by installing boat ramps, access trails, and other infrastructure. These investments help reinvigorate outdoor traditions and strengthen recreational economies that not only improve quality of life but also generate the public and private support needed to scale conservation across the entire basin.

## Coastal Resilience

**The Challenge:** The Mississippi River Delta is losing land at one of the fastest rates in the world – roughly the size of a football field every 100 minutes (Mississippi River Delta Coalition). Decades of levees, navigation channels, and upstream sediment disruption have weakened the natural systems that once protected coastal communities. As sea levels rise and storms intensify, the region faces escalating flood risk, saltwater intrusion, and the collapse of vital fisheries and working coastlines.

**The Solution:** Restoring coastal ecosystems in the Mississippi River Delta is essential to protecting communities, economies, and natural resources from accelerating threats. DU leads large-scale, nature-based restoration efforts, rebuilding wetlands, barrier islands, and sediment flows that reduce flood risk, buffer storm surge, and sustain fisheries and working coastlines. These projects not only safeguard lives and infrastructure, but also support long-term economic resilience and ecological health across the Gulf Coast. By investing in coastal restoration at scale, DU and partners are helping ensure that the region remains livable, productive, and protected for generations to come.

# HOW ARE WE HELPING TO TRANSFORM THE RIVER?

Ducks Unlimited is supporting the Mississippi River Basin and its vast network of watersheds through innovative nature-based solutions that restore wetlands, reforest floodplains, and reconnect critical habitats. These projects deliver wide-ranging benefits, from enhancing biodiversity to reducing flood risks, supporting ecotourism, and strengthening coastal communities. Success depends on strong collaboration with our corporate partners, state and federal agencies, and community stakeholders, whose support helps scale impactful, science-driven solutions across this vital landscape.

## Iowa Water Quality Wetlands

**Project Purpose:** *Nutrient Pollution Reduction*
**Co-Benefits:** *Native Habitat Restoration & Biodiversity, Flood Risk Reduction*

Agricultural landscapes play a vital role in the Mississippi River Basin, supporting local economies and global food systems. These working lands also present opportunities to integrate smart conservation practices. For example, tile drainage, commonly used to improve field conditions, can unintentionally carry excess nutrients into nearby waterways which contributes to broader challenges, such as nutrient loading in the Mississippi River Delta and The Gulf. Nutrient loading can lead to hypoxic zones that impact marine life. Closer to home, elevated nitrogen levels in drinking water sources can pose health risks to rural communities. Through this program, we are working to identify solutions that support both agricultural productivity and long-term environmental health.

Through our partnership with the Iowa Department of Agriculture and Land Stewardship (IDALS), DU is working directly with farmers to integrate wetlands into tile-drained agricultural fields. These wetlands help treat nitrogen- and phosphorus-rich runoff before it reaches major waterways. DU provides technical expertise, design support, and financial assistance, making it easier for producers to implement conservation practices that benefit both their operations and the environment.

**Partners:** IDALS, Microsoft, Nestlé Purina Petcare


Iowa project before


Iowa project after

## Horseshoe Lake State Park, Lower End, Illinois

**Project Purpose:** *Flood Risk Reduction*
**Co-Benefits:** *Outdoor Recreation Access and Tourism, Native Habitat Restoration*

In the Metro East region of Illinois, just across the Mississippi River from St. Louis, Missouri, approximately 17,000 acres of local municipal stormwater drains into Horseshoe Lake. During storm events, this water backs up into the lake, resulting in stormwater flooding in surrounding communities. Over time, sediment carried from neighboring areas and farmland has reduced the lake's capacity to store floodwaters.

Following major flooding events in the St. Louis region, the City of East St. Louis prioritized wetlands restoration to better manage backwater flooding. The city, DU, and partners secured funding for advanced hydrologic restoration efforts at and around Horseshoe Lake. This project restored nearly 700 acres of floodplain wetland and bottomland hardwood to improve Horseshoe Lake State Park's ability to store water during floods and intense rain events, manage quality wildlife habitat under future site conditions, and increase and improve public recreational opportunities.

**Partners:** City of East St. Louis, Federal Emergency Management Agency, Illinois Department of Natural Resources, Illinois State Habitat Stamp, Illinois State Waterfowl Stamp, Mississippi River Cities and Town Initiative, Office of Senator Dick Durbin (IL), Phillips 66, Enbridge Energy, American Water Charitable Foundation

## Rice Stewardship Program

**Project Purpose:** *Nutrient Pollution Reduction*
**Co-benefits:** *Groundwater Depletion Reduction*

Rice farming in the Mississippi Alluvial Valley faces increasing challenges due to shifting agricultural practices, input costs, and market dynamics. DU's Rice Stewardship Program is a unique partnership with the US Rice Federation that allows us to work directly with rice producers to implement conservation practices that optimize water use and nutrient use efficiency and enhance agricultural sustainability. Through technical expertise and financial incentives, DU helps farmers integrate activities such as efficient irrigation, precision nutrient management, and winter water holding. By shifting water reliance from aquifers to surface sources, this program strengthens long-term water security, supports natural nutrient cycling, and strengthens resilience across agricultural landscapes in the Mississippi River Basin.

**Partners:** Walmart Foundation, Mosaic Foundation for Sustainable Food Systems, Chevron, Nestlé Purina Petcare, US Department of Agriculture – Natural Resources Conservation Service, National Fish and Wildlife Foundation, and others.


## Ducks Unlimited Park, West Memphis, Arkansas

**Project Purpose:** *Outdoor Recreation Access and Tourism*
**Co-Benefits:** *Native Habitat Restoration & Biodiversity, Nutrient Pollution Reduction*

Located along a highly visible stretch of the Mississippi River across from downtown Memphis, Tennessee, the site of Ducks Unlimited Park has experienced years of habitat degradation and disconnection from the river's natural hydrology. These impacts reduce the land's ability to store floodwaters, filter runoff, and support wildlife, diminishing local ecosystem function and community resilience.

DU is restoring 1,500 acres of floodplain by reestablishing native vegetation and restoring functional bottomland and hardwood wetlands. These conservation actions are paramount to the area's wildlife, water quality, and ecosystem health. The site serves as a hub for outdoor recreation and eco-tourism. The land, trails, and park amenities are permanently protected with a conservation easement and have an endowment to sustain park operations now and in the future.

**Partners:** Big River Park Conservancy, First Horizon Foundation, Ingram Barge, Nestlé Purina PetCare, NextEra Energy, Nucor Steel, TennGreen, Walton Family Foundation, and others.

## Flyway Forests Reforestation Program

**Project Purpose:** *Carbon Sequestration*
**Co-Benefits:** *Native Habitat Restoration & Biodiversity*

Widespread deforestation and habitat loss in the Lower Mississippi River Valley have reduced biodiversity, diminished natural flood storage capacity, and weakened ecosystem function across the region, creating ripples that extend throughout the Mississippi River system. These landscape-scale changes contribute to increased flooding, degraded water quality, and loss of critical habitat for waterfowl and wildlife.

DU's Flyway Forests program addresses these challenges by restoring bottomland hardwood forests and wildlife habitat on private lands in the Lower Mississippi River Valley, its tributaries and adjacent counties. Through a public-private partnership model, DU works with landowners to design and implement reforestation projects that restore native species, strengthen landscape resilience, and create access to emerging ecosystem markets. DU is actively seeking additional partners to help expand this scalable model across other priority areas in the Mississippi River Basin, increasing habitat restoration and ecosystem resilience at scale.

**Partners:** Land and Water Co., Farm Journal, LandOption, Trust in Food, Private Landowners

## Working Lands for Resilient Communities, Scott County, Iowa

**Project Purpose:** *Nutrient Pollution Reduction*
**Co-Benefits:** *Flood Risk Reduction*

Scott County, Iowa, is a microcosm of the issues that plague many Mississippi River Basin states. Agricultural runoff and frequent flooding in the Quad Cities area of Iowa contribute to nutrient pollution and water quality degradation, threatening local ecosystems, wildlife habitat, and community resilience. Through the Scott County Iowa Working Lands for Resilient Communities program, DU is implementing proven agricultural conservation practices, including in-field and edge-of-field wetland restoration, cover crops, and saturated buffers, that help capture floodwaters, reduce nutrient runoff, and strengthen agricultural producers' bottom lines.

DU is collaborating with local farmers and landowners to drive voluntary, incentive-based conservation on working agricultural lands by implementing on-farm best management practices that improve water quality and resiliency across the Mississippi River Basin while supporting the agricultural community. We are also partnering with local conservation organizations and universities to measure the impacts of these practices and demonstrate their effectiveness. Building on the success of this initiative, DU is exploring opportunities to replicate this model in other priority watersheds across the basin.

**Partners:** Partners of Scott County Watershed, Iowa State University, Iowa Department of Agriculture and Land Stewardship, Mississippi River Cities and Towns Initiative, National Pork Board, Trust in Food, US Department of Agriculture

## South Dakota Working Grasslands

**Project Purpose:** *Native Habitat Restoration, Biodiversity*
**Co-Benefits:** *Nutrient Pollution Reduction, Carbon Sequestration*

Grass-based agriculture is well-suited to the soil types and terrain of South Dakota and can serve as an effective alternative for managing marginal soils. With the up-front cost share and technical assistance provided in this partnership, a productive mosaic of cash crops, forage crops, grasslands, wetlands, and livestock are possible. Participating landowners can expect to transition marginal cropland soils to healthy grasslands, improve water quality and soil health, and enhance habitat for grassland birds. Furthermore, livestock operations will financially benefit from improved program practices.

**Partners:** US Department of Agriculture, Bush Foundation

## Port Fourchon Terracing and Living Shoreline Project, Lafourche Parish, Louisiana

**Project Purpose:** *Coastal Resilience*
**Co-Benefits:** *Native Habitat Restoration, Biodiversity*

High rates of erosion and land subsidence along Louisiana's coast threaten vital ecosystems, infrastructure, and communities. In the area between Port Fourchon and the Gulf—home to Louisiana's largest industrial and recreational hub—these coastal changes increase vulnerability to storm surge, degrade water quality, and diminish habitat.

DU's Port Fourchon Terracing and Living Shoreline project restores over 1,200 acres of coastal marsh using 195,700 linear feet of earthen terraces and 4,070 linear feet of living shoreline. Terracing is effective at reducing wave energy, thereby increasing water quality through reduced turbidity, which allows sunlight to encourage submerged aquatic vegetation to grow. This vegetation then provides habitat for fish and other wildlife. This effort will buffer storm impacts, enhance habitat, and protect critical infrastructure, including the Louisiana Offshore Oil Port, the South Lafourche Levee System, and Highway 1 – the sole hurricane evacuation route from Grand Isle.

**Partners:** The Coca-Cola Foundation, ConocoPhillips, National Fish and Wildlife Foundation, National Oceanic and Atmospheric Administration, Port Fourchon, Ed Wisner Trust, Chevron, Louisiana Department of Wildlife and Fisheries, Louisiana Offshore Oil Port, Coastal Protection and Restoration Authority, Shell, US Fish and Wildlife Service, Cox Communications, Restore or Retreat, North American Wetlands Conservation Act, Lafourche Parish Government, Woodside Energy

## Minnesota Wetland Restoration

**Project Purpose:** *Native Habitat Restoration, Biodiversity*
**Co-benefits:** *Flood Risk Reduction, Nutrient Pollution Reduction*

In the headwaters of the Mississippi River, Minnesota's prairie and grassland landscapes have lost thousands of small, seasonal wetlands due to decades of agricultural drainage. These wetlands once played a vital role in filtering runoff, supporting waterfowl, and reducing flood risks. Today, underground tile systems designed to improve crop production rapidly move water off fields, carrying excess nitrogen and phosphorus into nearby streams. This nutrient-rich runoff flows downstream, contributing to hypoxia in the Gulf and threatening drinking water quality along the way.

To address this, DU and the United States Fish and Wildlife Service are restoring wetlands on high-priority waterfowl production areas by locating and removing drainage tile to reestablish natural hydrology. Since 2021, this partnership has restored or enhanced more than 560 wetlands, blending state and federal funding to deliver lasting ecological benefits across western Minnesota.

**Partners:** US Fish and Wildlife Service, Outdoor Heritage Fund, Minnesota Department of Natural Resources, Bame Foundation, Strehlow Family Fund, Flint Hills Resources

To learn more about the program or to get involved,
scan the QR code or email ecosystemservices@ducks.org

DUCKS UNLIMITED

Ducks Unlimited, Inc., One Waterfowl Way, Memphis, TN, 38120 • www.ducks.org
To learn more, email *ecosystemservices@ducks.org*

CNSU0013