TEXAS A&M UNIVERSITY
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TEXAS A&M UNIVERSITY
Rangeland, Wildlife
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Invasive Species Capstone Final Report

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Introduction

This document analyzes invasive species management across the Great Plains states, including Texas, New Mexico, Oklahoma, Colorado, Kansas, Nebraska, Wyoming, Montana, South Dakota, and North Dakota. The study highlights policies, funding structures, and control methods to address invasive species that threaten local ecosystems and economies.

Problem/Need

Invasive species have adverse impacts on ecosystem services such as biodiversity, agriculture, and water quality. Management of invasive plants and animals is critical to sustaining the livelihoods of the Great Plains that depend on functioning ecosystems that support grazing animals, crops and forests.

Proposed Solution

The paper presents a comparative analysis of each state's approach to invasive species, focusing on policies, funding, and control strategies. Our goal is to identify best practices and opportunities for enhanced regional collaboration.

Key Findings

- States use diverse methods to manage invasive species by prevention, control, and eradication.
- Control methods range from biological and mechanical approaches to chemical treatments and prescribed burns, with biological control favored for long-term sustainability.
- Funding varies, with some states relying on government programs and others utilizing public and private external partnerships.
- Collaboration among federal, state, and local entities is crucial for effective invasive species management including biological, chemical, and mechanical control.
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Recommendations

- Foster regional collaboration and resource sharing to reduce redundancy and improve efficiency.
- Enhance public education and early detection programs to prevent species spread.
- Expand funding through federal-state partnerships for sustainable management.
- Encourage diverse control strategies tailored to local ecosystems.

Conclusion

Despite variations in strategies across states, a regional approach that emphasizes collaboration, resource sharing, and innovative management techniques will strengthen the fight against invasive species and protect the Great Plains' natural resources and agricultural productivity.

Glossary

A.) **Organization Acronyms**

National	
CRP	Conservation Reserve Program
EQIP	Environmental Quality Incentives Program
NISC	National Invasive Species Council
NRCS	National Resources Conservation Service
USDA	United States Department of Agriculture
FSA	Farm Service Agency
Methodology	
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
NPS	National Park Service
NRCS	Natural Resources Conservation Service
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
Texas	
SWCD	Soil and Water Conservation District
TDA	Texas Department of Agriculture
TPWD	Texas Parks and Wildlife Department
TSSWCB	Texas State Soil and Water Conservation Board
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
WMA	Wildlife Management Area
WMA	Wildlife Management Association

New Mexico	
AMAFCA	Albuquerque Metropolitan Arroyo Flood Control Authority
BLM	Bureau of Land Management
EMNRD	Energy, Minerals, and Natural Resources Department
EQIP	NRCS Environmental Quality Incentives Program
ISC	Invasive Species Council
NMACD	New Mexico Association of Conservation Districts
NMDA	New Mexico Department of Agriculture
NMDGF	New Mexico Department of Game & Fish
NRCS	Natural Resources Conservation Service
SWCD	Soil and Water Conservation District
WMA	Wildlife Management Area
Oklahoma	
BIA	Bureau of Indian Affairs
CD	Conservation District
OCC	Oklahoma Conservation Commission
ODWC	Oklahoma Department of Wildlife Conservation
WMA	Wildlife Management Area
Colorado	
CD	Conservation District
CDA	Colorado Department of Agriculture
CNWMF	Colorado Noxious Weed Management Fund
CPWD	Colorado Parks and Wildlife Department

Kansas	
CD	Conservation District
CIG	Conservation Innovation Grant
EQIP	Environmental Quality Incentives Program
KDA	Kansas Department of Agriculture
KDWP	Kansas Department of Wildlife and Parks
KFS	Kansas Forest Service
NRCS	Natural Resources Conservation Service
SWG	State Wildlife Grants
Nebraska	
NDA	Nebraska Department of Agriculture
NGPC	Nebraska Games and Parks Commission
NISC	Nebraska Invasive Species Council
NRD	Natural Resources District
WMA	Wildlife Management Area
Wyoming	
CD	Conservation District
FWS	U.S. Fish & Wildlife Service
WGFD	Wyoming Game and Fish Department
WHMA	Wildlife Habitat Management Areas
Montana	
AIS	Aquatic Invasive Species
DNRC	Department of Natural Resources and Conservation
FWP	Fish, Wildlife, and Parks
MISC	Montana Invasive Species Council
MT DNRC	Montana Department of Natural Resources and Conservation

SWCD	Soil and Water Conservation District
WMA	Wildlife Management Area
South Dakota	
AIS	Aquatic Invasive Species
CD	Conservation District
CIG	Conservation Innovation Grants
DANR	Department of Agriculture and Natural Resources
DGFP	Department of Game, Fish, and Parks
North Dakota	
DWR	Department of Water Resources
NDDA	North Dakota Department of Agriculture
NDGFD	North Dakota Game and Fish Department
SCD	Soil Conservation District
SWG	State Wildlife Grant

B.) Invasive Species Mentioned

Species	Scientific Name
African Rue	Peganum harmala
Arundo Wasps	Tetremesa romana
Bullfrog	Lithobates catesbeianus
Bush Honeysuckle	Lonicera tatarica
Carrizo Cane	Arundo donax
Cheatgrass	Bromus tectorum
Feral Hogs	Sus scrofa
Flowering Rush	Butomus umbellatus
Gall Midge	Jaapiella ivannikovi
Gall Wasp	Aulacidea acroptilonica
Leafy Spurge	Euphorbia esula
Phragmites	Phragmites australis
Prickly Pear Cactus	Opuntia spp.
Russian Knapweed	Rhaponticum repens
Russian Olive	Elaeagnus angustifolia
Saltcedar	Tamarix ramosissima
South American Cactus Moth	Cactoblastis cactorum
Northern Tamarisk Beetles	Diorhabda carinulata
Zebra Mussels	Dreissena polymorpha

Introduction

Between 1960 and 2020, the United States spent an estimated $1.22 trillion on managing invasive species—an expense that highlights the scale and urgency of this growing ecological crisis (Fantle-Lepczyk et al., 2022). Invasive species, defined by Executive Order 13112 as non-native organisms that cause or are likely to cause economic, environmental, or health-related harm, are among the leading threats to biodiversity, water quality, and agricultural productivity nationwide (U.S. Department of Agriculture, 2019). The Great Plains, with its variety of prairies, forests, rivers, public, private, and agricultural lands, is susceptible to biological invasions that disrupt native ecosystems and strain public and private resources alike (Appendix A). Although federal policies provide a framework for managing invasive species, the responsibility for implementation often falls to state and local entities. As a result, strategies vary from state to state, influenced by differences in ecological conditions, available funding, and stakeholder engagement. The paper presents a comparative analysis of invasive species management across ten Great Plains states—Texas, New Mexico, Oklahoma, Colorado, Kansas, Nebraska, Wyoming, Montana, South Dakota, and North Dakota. This paper argues that while invasive species management across the Great Plains varies by state due to differences in policy, funding, and control methods, a comparative analysis reveals best practices and opportunities for greater regional coordination.

National Policies

Invasive species management in the United States is not organized under a system of legislation from Congress but through a series of Executive Orders from the President. The executive approach to invasive species has evolved from solely regulating the import and export of species (Executive Order 11987, 1977) to a coordinated management lead by the Departments of Agriculture and Interior (Executive Order 13112, 1999), that expanded to global prevention efforts (Executive Order 11987, 1977; Executive Order 13112, 1999; Executive Order 13751, 2016). These policy advancements reflect a growing commitment to addressing invasive species through increasingly comprehensive and proactive strategies.

Recognizing the threats posed by non-native species, national leaders took early measures to prevent their introduction. In 1999, President Bill Clinton signed Executive Order 13112, titled Exotic Organisms, to restrict the introduction of exotic species into the United States and regulate the export of native species (Executive Order 13112, 1999). Executive Order 13112, revoked Executive Order 11987, and established the National Invasive Species Council (NISC). This was to ensure federal agencies implement effective management practices to prevent the spread of invasive species (Executive Order 11987, 1977). By delegating this authority, the policy acknowledged that not all exotic species are harmful but that their movement requires oversight.

Approximately two decades later, national attention shifted toward the broader impacts of invasive species. In 1999, President Bill Clinton signed Executive Order 13112, the first executive order specifically addressing invasive species (Executive Order 13112, 1999). This order revoked Executive Order 11987 and established the NISC to ensure federal agencies implement effective management practices to prevent the spread of invasive species. The NISC guides federal agencies and develops recommendations for both national and international management. These recommendations are compiled in the *National Invasive Species Management Plan*, which is reevaluated at least every five years by the NISC to incorporate necessary updates (Executive Order 13112, 1999). The periodic revision of this plan reflects the evolving nature of invasive species threats and the government's commitment to adaptive management.

The most recent executive order on invasive species, Executive Order 13751, *Safeguarding the Nation From the Impacts of Invasive Species,* was signed in 2016 by President Barack Obama. It expanded upon Executive Order 13112 by emphasizing the increasing threats posed by invasive species and the responsibility of the United States government to prevent their introduction, spread, and establishment both domestically and internationally (Executive Order 13751, 2016). To address the threats posed by invasive species, Executive Order 13751 changed the revision requirement for the *National Invasive Species Management Plan* from five years to an annual review. The work plan for fiscal year 2025 added "Biological Control" and "Islands" and removed "Outreach and Engagement" from the thematic priority activities list (U.S. Department of Interior, 2023; U.S. Department of Interior 2024). This order highlights the growing recognition that invasive species management requires a proactive, coordinated approach at both national and global levels.

The USDA National Resources Conservation Service (NRCS) oversees the Environmental Quality Incentives Program (EQIP) to help landowners conserve land (USDA, 2024). This program offers financial and technical guidance on how to best protect and preserve soil, water, and wildlife habitats. Financial assistance is made possible through Conservation Innovation Grants. Technical guidance entails landowners and a NRCS employee creating a unique conservation plan that addresses environmental needs and best practices.

Similar to the NRCS EQIP, the United States Department of Agriculture's Farm Service Agency (USDA FSA) manages the Conservation Reserve Program (CRP). Participating in this program is a ten to fifteen year long commitment during which the FSA pays farmers to stop agricultural production on certain tracks of land (USDA, *n.d.-b*). Participation in the CRP is voluntary, but eligibility is determined by the environmental sensitivity of the land (USDA FSA, 2024). If a piece of land is deemed eligible for this program, the NRCS provides technical assistance to the landowners for the conservation and revitalization of the area (USDA, *n.d.-b*).

Methodology

To support invasive species management across the ten Great Plains states, a comprehensive database of relevant organizations was developed. This database was constructed using a variety of sources, including state conservation groups, municipalities with populations over 50,000, and 501(c)(3) tax-exempt conservation organizations. Data collection involved a combination of direct outreach—via phone and email—and searches through publicly available online resources. The resulting data was visualized using Tableau Public, allowing for a spatial representation of organizational presence by county for the state of Texas, and organizational counts for each of the Great Plains states

The organizations included in this analysis span a range of conservation actors involved in managing invasive weeds and pests. These include:

- National Parks & State Parks
- U.S. Army Corps of Engineers
- Municipalities
- Soil and Water Conservation Districts
- River Authorities
- Land Trusts
- National & State Forests
- Wildlife Management Associations
- Conservation Associations
- Conservation Easements

Because not every state uses the same institutional structures or names, similar organizations were identified when an exact match did not exist. For instance, Texas refers to its regional water organizations as River Authorities, while Nebraska calls them River Basins (Appendix B).

Municipalities with populations exceeding 50,000 were included due to their responsibility for managing public infrastructure such as parks, roads, and utility corridors, which are often affected by invasive species (US Census Bureau, 2021). Likewise, 501(c)(3) organizations listing “conservation” as a tax exemption purpose were incorporated, recognizing their vital role in cross-jurisdictional coordination (US Tax Code, 2024). These conservation actors play a critical role in coordinating invasive species management across jurisdictions in Texas.

To identify patterns in organizational coverage and activity, additional data was collected on federally managed lands and tribal territories using publicly available sources from the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), National Park Service (NPS), U.S. Forest Service (USFS), and Bureau of Indian Affairs (BIA). These datasets were normalized by the sample average state population and area to assess the proportional distribution of management responsibilities.

A survey was also developed to better understand how these conservation actors operate and collaborate. Designed by graduate students from the Department of Education and Human Development at Texas A&M University and funded by the Natural Resources Conservation Service (NRCS), the survey aims to uncover how organizations share responsibilities such as finances, labor, time, equipment, and information. The survey was initially distributed to conservation organizations in Texas, with plans to expand to the remaining Great Plains states to capture regional variations in management strategies.

The survey was distributed using a software called Mailchimp. This allowed us to distribute several surveys at once that were personalized to each organization. The total number of emails distributed were 1,633 with 780 being distributed in January and 777 in February. We sent a second reminder email in March to municipalities equaling 64 emails, and in April we followed up with 12 organizations who had started but not finished the survey. Mailchimp calculates the rate at which emails were opened as well as how often the link to the survey was clicked. The total open rate was 55.4% while the click rate was 6.7%.

As of April 2025, responses have been received only from Texas organizations. Preliminary findings indicate that conservation associations were the most responsive, while SWCDs showed low participation. In many cases, respondents began but did not complete the survey—particularly when asked to detail organizational activities and partnerships. This may reflect differences in reporting obligations: while conservation associations are required to disclose partnerships and actions for tax purposes, SWCDs are not.

Moving forward, the survey will be tailored to improve response rates among underrepresented groups, especially SWCDs, and will be rolled out across the remaining states. This expanded dataset will support a broader network analysis, offering insight into policy effectiveness, collaboration, and resource allocation across the region. The ultimate goal is to identify successful strategies that can be replicated and shared across state lines to enhance invasive species management efforts.

Great Plains States

The ten Great Plains states—Texas, New Mexico, Oklahoma, Colorado, Kansas, Nebraska, Wyoming, Montana, South Dakota, and North Dakota—each employ distinct invasive species management strategies shaped by geography, governance structures, and resource availability. While all states operate under a common federal policy framework, their implementation varies widely in terms of funding sources, control methods, stakeholder engagement, and institutional coordination. States like Texas and Colorado prioritize state-led funding and biological control, whereas others like Nebraska and Montana rely on multi-agency partnerships and public land management. Unique models, such as Oklahoma's integration of tribal conservation districts, highlight the potential for diverse governance approaches. Across the board, control methods range from chemical treatments and mechanical removal to biological agents and cultural practices like prescribed burning. These state-level profiles reveal both strengths and systemic gaps in capacity, coordination, and reporting—reinforcing the need for a more integrated regional approach to invasive species management.

Texas

Texas, with its vast landscapes and diverse ecosystems, faces unique challenges in managing invasive species, which are addressed through policies like the Noxious Weed Act, state regulations, and funding for conservation efforts, while biological control methods, such as introducing natural predators, are widely used to manage species like Carrizo Cane, despite their long research and implementation periods.

State Context (Geography)

Texas, the second-largest state in the U.S., spans 261,263.10 square miles of land and 7,332.80 square miles of water area (Appendix C) (United States Census Bureau, 2025). The state is home to 191,228 miles of rivers, including the Rio Grande, Pecos, and Brazos Rivers, which account for 5.2% of the nation's total river mileage (Appendix A-1. Total Miles of Rivers and Streams in the Nation, n.d.). These extensive water systems, combined with Texas's vast and diverse landscapes, create a unique ecological framework that poses distinct challenges for invasive species management.

Texas is divided into ten natural regions, each fostering different ecosystems (Texas Parks and Wildlife, 2019). The eastern part of the state, for example, features the Piney Woods, home to dense forests filled with pines and hardwoods (Texas Parks and Wildlife, 2019). Adjacent to this are the Gulf Prairie Marshes, which stretch along the coastline and consist of coastal grasslands and wetlands (Texas Parks and Wildlife, 2019).

Moving inland, the Post Oak Savannah serves as a transitional zone with a mix of oak woodlands and grasslands, while the Blackland Prairie is characterized by its fertile black soils that support tallgrass prairies (Texas Parks and Wildlife, 2019). The Cross Timbers region in central Texas offers a mosaic of woodlands and prairies, while further south, the South Texas Plains is defined by thorny shrubs, subtropical woodlands, and semi-arid grasses (Texas Parks and Wildlife, 2019). The Edwards Plateau in central Texas features limestone hills and clear streams, supporting diverse plant and animal communities (Texas Parks and Wildlife, 2019). The Rolling Plains provide wavy terrain with mixed-grass prairies, transitioning into the flat terrain of the High Plains (Texas Parks and Wildlife Department, 2019). Finally, the far west's Trans-Pecos region is home to desert landscapes and rugged mountains (Texas Parks and Wildlife Department, 2019). The complexity and scale of Texas' natural landscapes require thoughtful, comprehensive strategies to preserve its ecological balance and tackle the growing issue of invasive species.

State Policies

Texas has implemented a range of policies and legal provisions to combat the threat of noxious and invasive species. One key piece of legislation is the Texas Noxious Weed Act, which empowers landowners to initiate the creation of noxious weed control districts, also known as Soil and Water Conservation Districts (SWCD). To establish such a district, a petition must include signatures from at least fifty eligible landowners, along with the proposed district's name and boundaries (Texas Statutes Title 5, Chapter 78, 2025). Once established, each district is governed by an elected board composed of landowners from within the district. This board is responsible for identifying target weed species and determining appropriate management strategies. Failure to comply with district directives can result in legal action against non-compliant landowners.

In addition to the Noxious Weed Act, the state delegates authority to the Texas Department of Agriculture (TDA) for determining what species are noxious and invasive. The TDA is tasked with identifying and publishing an official list of species deemed noxious and invasive based on their potential to cause economic or ecological harm within the state (Texas Statutes Title 5, Chapter 71, 2017). This list serves as a foundational resource for weed control districts, informing their management priorities and actions. The TDA also oversees the regulation of species transportation across state lines, helping to prevent the introduction and spread of harmful organisms.

In addition to terrestrial efforts, aquatic invasive species are addressed through the Texas Parks and Wildlife Department (TPWD), which has specific regulatory responsibilities. Under Texas law, the TPWD manages the exchange of ballast water and mandates the proper cleaning of aquatic vessels to reduce the spread of invasive organisms (Texas Statute Title 5, Chapter 66, 2015).

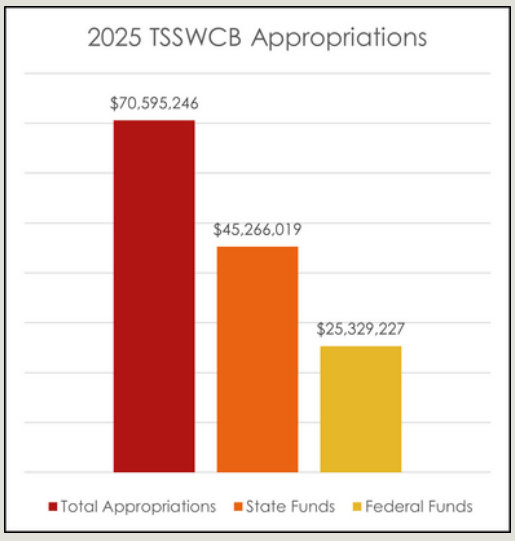
Ballast water regulation is designed to minimize the introduction of non-native species into Texas waterways, while vessel cleaning protocols help prevent the transfer of invasive species between bodies of water. These measures are essential for maintaining the ecological integrity of Texas's aquatic ecosystems.

Funding

State funding in Texas plays a vital role in supporting the Texas State Soil and Water Conservation Board (TSSWCB)'s efforts to control invasive species and promote long-term agricultural sustainability. The TSSWCB plays a crucial role in funding the management of invasive species across the state. This program empowers landowners to take responsibility for managing and conserving their land (TSSWCB, n.d.). The TSSWCB allocates funds to the districts from appropriations made by the Texas Legislature. In 2025, the TSSWCB anticipates receiving a total of $70.6 million in state and federal funding. (TSSWCB, 2024). The only allocation directly addressing invasive species is for the Carrizo Cane Eradication Program, which is funded at $3.6 million annually (TSSWCB, 2024). State-level staff assists in implementing local programs, while individual SWCDs have some discretion to pursue additional grants and partnerships to control invasive species. The Sunset Review, conducted by the Sunset Advisory Commission in 2023, concluded that the TSSWCB is effectively working with landowners to conserve soil and maintain agricultural productivity. Senate Bill 1424 endorsed the review and extended the board's mandate for another 12 years (TSSWCB, 2024). This funding is integral to the success of soil conservation, agriculture, and invasive species management in Texas.

Figure 1

2025 TSSWCB Appropriations



Note. Figure 1 describes money appropriated from TSSWCB in 2025.

Control Methods

Texas employs a variety of control methods towards managing invasive species, with biological control being the most widely used. Biological control, as described by the U.S. Department of Agriculture (USDA), involves introducing natural predators or enemies of the invasive species —typically from their native region—into areas where the invasives have spread (USDA, 2024; Department of Energy and Environment, 2023). This approach receives government funding through partnerships, such as those with the U.S. Forest Service. While this method is supported by respected conservation organizations, potential risks still need to be carefully evaluated.

One of the key challenges of biological control is the lengthy period of research required to identify a viable predator. In some cases, it can take up to 15 years of research before a predator is introduced into an environment. For example, South American cactus moths (Cactoblastis cactorum) were used to control invasive prickly pear cacti (Opuntia spp.) (Green, 2023). While this method can be effective in the long term, it may not always provide the immediate results that other control methods, such as chemical control, can offer. In the Rio Grande basin, Texas has been dealing with Carrizo Cane (Arundo donax) through biological controls such as Arundo Wasps (Tetremesa romana) to eradicate the invasive plant along the Rio Grande river (Appendix D) Nevertheless, biological control remains a widely favored method due to its long-term effectiveness in managing invasive species.

New Mexico

New Mexico's diverse geography across four distinct regions supports various invasive species management approaches, guided by the Noxious Weed Control Act (1959) and Noxious Weed Management Act (1998), with funding from multiple sources including the New Mexico Department of Agriculture (NMDA) $60,000 grant program and Energy, Minerals and Natural Resources Department (EMNRD)'s Landscape Scale Restoration grants ranging from $25,000 to $300,000, primarily employing mechanical control methods to address problematic species like Saltcedar, African Rue, and Cheatgrass (Bromus Tectorum).

State Context (Geography)

New Mexico, the fifth-largest state in the U.S., spans 121,312.2 square miles of land and 281.0 square miles of water area (Appendix C) (United States Census Bureau, 2025). The state is home to 110,741 miles of rivers, including the Pecos, Gila, and San Juan Rivers, which account for 3.02% of the nation’s total river mileage (Appendix A-1. Total Miles of Rivers and Streams in the Nation, n.d.). Known for its diverse landscapes and varying elevations, New Mexico experiences a wide range of climatic conditions that influence the distribution of both native and invasive species.

The state is divided into four distinct land regions: the Great Plains, the Colorado Plateau, the Rocky Mountains, and the Basin and Range region (New Mexico Museum of Art, n.d.). New Mexico's lowest elevation, at 2,845 feet above sea level, is found at Red Bluff Reservoir, while its highest point is Wheeler Peak at 13,161 feet (World Atlas, 2021; New Mexico Economic Development Department, n.d.). These variations in elevation and climate create diverse ecosystems, allowing native plants to flourish in specific environments. Similarly, invasive species establish themselves in habitats that provide the conditions necessary for their growth. For instance, Saltcedar (Tamarix ramosissima) thrives in riparian zones along streams and rivers, while Cheatgrass (Bromus tectorum) grows in mountain regions receiving 6 to 22 inches of annual precipitation (National Park Service, n.d.-b; USDA, 2014). The state's unique geographical features and climate patterns complicate invasive species management, requiring tailored strategies to address each species' spread.

State Policies

New Mexico has enacted several state policies to control noxious weeds and safeguard both its environment and economic interests. In 1959, the state introduced the Noxious Weed Control Act, establishing regulatory districts aimed at preventing infestations and protecting land and resources (New Mexico Compilation Commission, n.d.a). Each district must cover at least 1,280 acres and can include any political subdivision within the state (New Mexico Compilation Commission, n.d.a). In 1998, New Mexico introduced the Noxious Weed Management Act, which bolstered efforts to manage invasive species (New Mexico Compilation Commission, n.d. b). The Act led to the appointment of a director responsible for coordinating integrated weed management programs. The director's duties include selecting species for control, identifying control methods, and developing public education materials. The director has authority over weed control on both public and private lands, though access to private lands requires the landowner's consent. If invasive species are found on private land, the director must notify the landowner about the weeds and available control options (New Mexico Compilation Commission, n.d. b). These policies emphasize the importance of balancing invasive species management with property rights.

Funding

New Mexico, supported by a variety of funding sources, fosters a collaborative approach to invasive species management. Federal, state, and local organizations work together to provide resources for landowners and stakeholders across the state. For instance, the New Mexico Association of Conservation Districts (NMACD) coordinates funds from the Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) and the Bureau of Land Management (BLM)'s Restore New Mexico Programs (NMACD, n.d.).

The NMACD Restoration Initiative, operating for over 19 years, has helped 13 SWCDs develop over 170 Coordinated Resource Management Plans and treat 78 watersheds (NMACD, n.d.). This collaborative approach, supported by consistent funding and partnerships, is key to New Mexico's statewide invasive species management efforts.

Agencies such as the NMDA and the EMNRD play key roles in funding invasive species management. The NMDA offers up to $60,000 in grants through its Noxious Weed Management Grant Program for activities such as early detection, rapid response, and integrated weed management (NMDA, n.d.). Meanwhile, the EMNRD provides Landscape Scale Restoration Grants ranging from $25,000 to $300,000 for science-based restoration projects aimed at protecting forests, watersheds, and preventing the spread of invasive species (EMNRD, n.d.). These funding initiatives underscore the state's commitment to supporting both local and state efforts to manage invasive species.

Control Methods

Invasive species management in New Mexico involves a range of strategies, with mechanical control methods being commonly used, especially for aggressive species. Among the most problematic invasive species in the state are Saltcedar, African Rue (Peganum harmala), and Cheatgrass (Mealor et al., 2013). Saltcedar, for instance, has spread across more than a million acres of southwestern streambanks, where it diminishes water flow, raises soil salinity, and degrades habitat for native species. African Rue poses health risks through allergic reactions and also reduces the usability of recreational lands, while Cheatgrass competes with native species and decreases forage land and wildlife habitat (Mealor et al., 2013). The management approaches for each invasive species vary. Physical removal is often the most effective way to control the spread of Saltcedar, while African Rue is best managed through prevention and early detection (Beck & Wanstall, 2021). Cheatgrass is typically controlled by burning before seed dispersal, although this approach may leave some seeds behind, leaving the area susceptible to re-invasion (Beck & Wanstall, 2021). These tailored management methods help reduce the environmental and economic impacts of invasive species, ensuring that the state's ecosystems and natural resources are protected.

Oklahoma

Oklahoma's invasive species management operates under a unique dual governance structure with state conservation districts under the Oklahoma Conservation Commission (OCC) and independent tribal conservation districts managed by the Five Civilized Tribes, receiving funding from both state and federal sources, employing diverse control methods including the NRCS feral hog eradication program, controlled burns for invasive cedar trees, and biological controls like weevils for invasive thistles, with enhanced coordination through the 2022 intertribal hunting and fishing agreement.

State Context (Geography)

Oklahoma, the 19th-largest state in the U.S., spans 68,595.9 square miles of land and 1,303.1 square miles of water area (Appendix C) (United States Census Bureau, 2025). The state is home to 78,778 miles of rivers, including the Red, Arkansas, and Canadian Rivers, which together account for 2.1% of the nation's total river mileage (Appendix A-1. Total Miles of Rivers and Streams in the Nation, n.d.). While Oklahoma is primarily located in the Great Plains region, its geography is diverse, featuring not only expansive plains but also mountains and forests. This geographic variety supports a wide range of ecosystems, making the state susceptible to different types of invasive species. Oklahoma also has a unique demographic and governance structure due to its history as an Indian Territory. The state is home to several Native American tribes, notably the Five Civilized Tribes: the Cherokee, Choctaw, Chickasaw, Muscogee Creek, and Seminole (Wilson, n.d.). Tribes have sovereign authority to manage natural resources under treaty agreements with the US Government rather than the state. Each tribe operates its own government, constitution, and institutions, leading to distinct jurisdictional differences across the state. This sovereignty has important implications for invasive species management, as tribes have a substantial role in managing their lands independently from the state of Oklahoma.

State Policies

Oklahoma's approach to invasive species management is influenced by both state and tribal governance. The state has established conservation districts, which derive their authority from the OCC (OCC, 2021). These districts, like those in other Great Plains states, focus on conservation and land management. However, unlike most other states, Oklahoma also has tribal conservation districts managed by individual nations. These districts are formed through partnerships with the NRCS and are not overseen by the OCC (Choctaw, 2023). Each of the Five Tribes has its own conservation agency responsible for land management. For example, the Cherokee Nation, the largest of the Five Tribes, oversees conservation through its Environmental Protection Commission, which operates under the Secretary of Natural Resources Office (Cherokee, 2024). The other tribes, such as the Choctaw and Chickasaw Nations, have similar structures, contributing to a network of conservation efforts across the state. This decentralized governance creates a complex system of land and species management, as the tribes manage conservation efforts independently of state agencies. The landmark McGirt v. Oklahoma Supreme Court decision in 2020 further complicated jurisdictional matters by returning criminal authority over much of eastern Oklahoma to the Muscogee Creek Nation (Supreme Court, 2019). This decision highlighted the evolving nature of tribal authority and its impact on land and resource management, including invasive species control.

Funding

Funding for invasive species management in Oklahoma comes from both state and federal sources. The OCC allocates funds to conservation districts through its Conservation Programs Division, which in turn administers various programs to meet the needs of landowners (OCC, 2021). These funds support programs such as the Locally Led Cost Share Program, flood control initiatives, and other rehabilitation efforts (OCC, 2021). The program budget for the current year is set at just under $3,500,000 (OCC, 2025). In addition to state-level funding, tribes in Oklahoma receive support from federal conservation programs. The collaboration between the NRCS and tribal agencies helps fund a wide range of conservation and invasive species management projects, such as those managed by the Bureau of Indian Affairs (BIA, n.d.). This partnership reflects the growing recognition of tribal governance in the state's broader conservation framework. An example of this is the Eastern Red Cedar Eradication project, in which the BIA allocated $249,427 to the Potawatomie Nation in 2022 to eradicate the invasive tree from tribal lands (BIA, n.d.).

Control Methods

Oklahoma employs a variety of control methods to address invasive species, with a particular focus on species like feral hogs (Sus scrofa), invasive cedar trees, and thistles. One of the most notable efforts is Oklahoma’s participation in the NRCS feral hog eradication program, which operates similarly to Texas' program (NRCS, 2023). Feral hogs are a major concern due to their destructive impact on ecosystems, crops, and infrastructure. Hunting is a common practice to control hog populations, and a 2022 agreement between the Five Nations allows a hunting and fishing permit issued by one nation to be valid across all five tribes (Choctaw, 2024). This intertribal agreement has enhanced efforts to control invasive wildlife across the state.

Controlled burns and mechanical brush control methods are used to manage invasive juniper and cedar trees, which threaten native plant species and water resources (Oklahoma House of Representatives, 2023). The state also utilizes controlled burns to address invasive thistles, which are notorious for outcompeting native vegetation. Additionally, biological control methods, such as introducing weevils to areas with high populations of invasive thistles, are used to reduce the spread of these plants (Royer, et al., 2018). These control methods, in combination with state and tribal partnerships, form a multifaceted approach to managing invasive species in Oklahoma. Each strategy is tailored to the specific species and ecosystems affected, ensuring a more effective response to the growing problem of invasive species across the state.

Colorado

Colorado manages invasive species across its diverse landscape through the Colorado Noxious Weed Act and targeted legislation like the Stop the Spread of Invasive Mussels Act.

This is done by allocating over $700,000 annually from the Colorado Noxious Weed Management Fund (CNWMF) (which has distributed over $1.25 million historically), and employing varied control methods including draining Highline Lake to combat zebra mussels and introducing biological controls like gall midges and wasps against Russian knapweed.

State Context (Geography)

Colorado, the eighth-largest state in the U.S., spans 103,637.5 square miles of land and 457.4 square miles of water area (Appendix C) (United States Census Bureau, 2025). The state contains 107,403 miles of rivers, including ones like the Arkansas, San Juan, and Animas Rivers, which together account for 2.9% of the nation's total river mileage (*Appendix A-1. Total Miles of Rivers and Streams in the Nation*, n.d.). Geographically, Colorado is highly diverse, featuring mountain ranges, plateaus, and plains. The western half of the state is dominated by the Rocky Mountains, while the eastern part consists mainly of expansive plains (Dietz & Loeffler 2025). The state's topographical diversity influences the spread and management of invasive species across both lowland and mountainous areas. The state's geographical characteristics present both opportunities and challenges for controlling invasive species.

State Policies

Colorado has various state policies to combat invasive species, with a focus on noxious weeds. The Colorado Noxious Weed Act is the state's primary legislative tool for managing undesirable plants, emphasizing both economic and ecological protection. This act outlines specific species considered noxious and how they should be managed to minimize financial impacts while effectively controlling their spread (Ouray County, 2003). Through this legislation, Colorado has created a structured approach for addressing invasive species on a state level.

In addition to the Noxious Weed Act, Colorado has also introduced policies to address the spread of zebra mussels (*Dreissena polymorpha*), a highly destructive aquatic invasive species. To combat the invasive zebra mussels, U.S. Representative Joe Neguse and Senators Michael Bennet and Steve Daines introduced the Stop the Spread of Invasive Mussels Act, aimed at increasing federal-state cooperation to tackle this issue (Woodruff, 2024). This bill highlights Colorado's ongoing efforts to address new and emerging invasive species through collaborative legislation.

Funding

Managing invasive species in Colorado requires significant financial resources, which are allocated through various channels. A key funding source is the CNWMF, created by the Noxious Weed Act.

This fund facilitates the allocation of state resources to local entities, including counties, which are responsible for managing invasive species at the ground level (Ouray County, 2003). The CNWMF was started in 1977 to increase financial assistance for organizations, governments, and individuals involved with managing noxious weeds in the state. Originally started in 1977, the fund has distributed over $1.25 million between 1977 and 1982 and continues to receive an annual appropriation of $700,000 from the state legislature (Colorado Department of Agriculture 2022a). This fund provides crucial financial support for managing noxious weeds across Colorado's varied landscapes. Additionally, the Colorado Department of Agriculture (CDA) distributes over $700,000 in annual grants to organizations and agencies dedicated to managing noxious weeds (Colorado Department of Agriculture, 2022a). These grants are sourced from both the state's Noxious Weed Fund and the United States Forest Service's State and Private Forestry Program. This financial support ensures that both state and federal resources are dedicated to tackling high-priority invasive species, allowing Colorado to protect its agricultural and natural resources effectively (Colorado Department of Agriculture 2022a). These collaborative funding efforts highlight the state's commitment to addressing invasive species and maintaining the integrity of its ecosystems and agricultural industries.

Control Methods

Colorado employs a mix of mechanical, chemical, and biological control methods to manage invasive species. One of the most recent efforts focuses on the zebra mussel, which was first detected in the Colorado River and Highline Canal in 2024. To curb its spread, Colorado Parks and Wildlife (CPW) temporarily closed Highline Lake and drained it to eliminate as many mussels as possible (Woodruff, 2024). This action is part of a broader strategy to prevent the establishment of zebra mussels, which could disrupt aquatic ecosystems and water infrastructure across the state. Future regulations are expected to include stricter vessel decontamination protocols, aiming to prevent further introduction of invasive species into state waters.

In addition to these physical interventions, Colorado utilizes biological control methods for managing other invasive species. For example, the state has introduced two non-native species —gall midges (Jaapiella ivannikovi) and gall wasps (Aulacidea acroptilonica)—to combat the spread of Russian knapweed (Rhaponticum repens). Russian knapweed, which was introduced to Colorado in the late 1800s, has since become a major environmental threat, outcompeting native plants and negatively impacting livestock. Since their introduction in 2009 and 2016, gall midges and wasps have helped to slow the spread of Russian knapweed, effectively managing its population without eradicating it (Colorado Department of Agriculture 2022b). This approach reflects Colorado's pragmatic strategy, recognizing that complete eradication of invasive species is often unfeasible, and management is a more realistic goal.

Kansas

Kansas employs a multi-faceted approach to managing invasive species, integrating regulatory policies, funding programs, and diverse control methods. The state enforces key laws, including the Noxious Weed Act, Plant Protection Act, and Kansas Seed Law, to regulate invasive species. Funding from federal, state, and local sources supports control initiatives, while Kansas implements an Integrated Weed Management strategy combining chemical, biological, mechanical, and cultural methods. These efforts collectively help protect Kansas' diverse landscapes and waterways from ecological threats.

State Context (Geography)

Kansas, the 13th-largest state in the U.S., spans 81,758.5 square miles of land and 519.7 square miles of water (Appendix C) (United States Census Bureau, 2025). The state is home to 134,338 miles of rivers, including the Missouri, Arkansas, and Smoky Hill Rivers, which account for 3.6% of the nation's total river mileage (Appendix A-1. Total Miles of Rivers and Streams in the Nation, n.d.). The geography of Kansas is diverse, featuring a mix of croplands, grasslands, forests, wetlands, and floodplains (Kansas Wildlife Action Plan, n.d.). While the eastern region is rich in croplands, grasslands, and forests, the western region is primarily dominated by grasslands. Overall, prairies and grasslands cover 44% of Kansas, while croplands account for 43% (Moody, 2022). Despite these natural landscapes, human development has fragmented native ecosystems, confining them to remnant patches that are increasingly vulnerable to invasive species (Moody, 2022). Given the state's varied geography and climate, Kansas has developed tailored invasive species management practices to address these challenges effectively.

State Policies

Kansas has established three key policies to combat invasive and noxious weeds: the Noxious Weed Act, the Plant Protection Act, and the Kansas Seed Law (Kansas Noxious and Invasive Weed Management Plan, 2022). The Noxious Weed Act grants the Kansas Department of Agriculture (KDA) the authority to identify and regulate noxious weeds based on recommendations from the State Noxious Weed Advisory Committee (Kansas Noxious and Invasive Weed Management Plan, 2022). The Plant Protection Act enforces quarantines and other measures to prevent the introduction and spread of invasive species (Kansas Noxious and Invasive Weed Management Plan, 2022). The Kansas Seed Law regulates seed distribution by prohibiting the sale of noxious weed seeds, restricting contaminated seeds, and enforcing labeling requirements (Kansas Noxious and Invasive Weed Management Plan, 2022). Together, these laws provide a regulatory framework for controlling invasive species and preserving native ecosystems.

To prevent the spread of aquatic invasive species, Kansas enforces additional statutes and regulations. The Kansas Department of Wildlife and Parks (KDWP) oversees the importation, possession, and transportation of wildlife (Kansas Department of Wildlife & Parks, 2023a). Additional regulations prohibit the transportation of live fish from certain waters and restrict the use of wild-caught bait. Precautionary measures, such as draining bilges and livewells before vessel transportation, further help reduce contamination risks. These regulations play a crucial role in protecting the state's waterways from invasive species.

Funding

Kansas' invasive species management efforts are supported by federal, state, and local organizations, including the KDA, the KDWP, Kansas Forest Service (KFS), and Natural Resources Conservation Service (NRCS). From 2001 to 2010, Kansas received over $9 million in federal funding through the State Wildlife Grants (SWG) program to implement the State Wildlife Action Plan, which includes invasive species management initiatives (Kansas Department of Wildlife & Parks, 2023c). The Noxious Weed Control Program, managed by the KDA, provides technical assistance to agencies and landowners while collaborating with the NRCS to secure funding for control measures (Noxious Weed Control Program | Department of Agriculture, 2024). Additional funding comes from the USDA's Conservation Innovation Grants (CIG) program, which supports various natural resource management projects, including invasive species control (Conservation Innovation Grants - Kansas | Natural Resources Conservation Service, 2025). The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to Kansas agricultural producers and forest landowners, helping them implement invasive species management strategies (Environmental Quality Incentives Program - Kansas | Natural Resources Conservation Service, 2023). The KFS also receives funding through grants, donations, and partnerships with organizations such as the USDA Forest Service (Kansas Forest Service, 2023). By leveraging multiple funding sources and collaborations, Kansas effectively implements invasive species control strategies.

Control Methods

Kansas uses many approaches to combat invasive species, utilizing a variety of strategies to address the challenges posed by noxious weeds. Kansas employs an Integrated Weed Management strategy, which incorporates chemical, biological, mechanical, and cultural control methods to manage invasive and noxious weeds (Kansas Department of Agriculture, 2024). The KFS promotes chemical treatments for managing infestations such as bush honeysuckle (*Lonicera tatarica*), particularly in the fall, and provides tools such as backpack mist blowers for efficient herbicide application (Kansas Forest Service, n.d). Kansas county noxious weed agencies offer cost-share herbicides at subsidized rates, while state law mandates that only certified pest control businesses with a license from the KDA Pesticide Program may apply pesticides commercially (Kansas Department of Agriculture, 2024).

Biological control methods require consultation with the County Weed Director or the KDA. While not all noxious weeds can be managed using biological agents, the KDA has secured permits for those that specifically target certain invasive species (Department of Agriculture, 2024). Mechanical control is primarily used for small infestations of annual or biennial weeds, but due to its labor-intensive nature, it is generally not feasible for large-scale applications. Cultural control methods, such as prescribed burning, are widely used in Kansas rangelands to control invasive tree species. Targeted grazing is another cultural practice employed to manage invasive plant populations effectively (Kansas Department of Wildlife & Parks, 2023b). By integrating chemical, biological, mechanical, and cultural control strategies, Kansas ensures a comprehensive approach to managing invasive species while preserving its natural ecosystems.

Nebraska

Nebraska employs a comprehensive approach to invasive species management through legislative policies, funding initiatives, and diverse control methods. Key statutes, including the Nebraska Revised Statute 2-958.02 and Nebraska Statutes 37-1403 and 37-1404, establish regulations and oversight for invasive species control. Funding from state agencies and partnerships, including the Nebraska Invasive Species Council (NISC), the Nebraska Game and Parks Commission (NGPC), and Nebraska Wildlife Management Areas (WMA), supports large-scale management efforts, with millions allocated to invasive species removal and habitat restoration. Nebraska utilizes chemical treatments, prescribed burning, and collaborative partnerships to mitigate invasive species, ensuring the protection of its natural resources and agricultural productivity.

State Context (Geography)

Nebraska, the 15th-largest state in the U.S., spans 76,816.5 square miles of land and 530.8 square miles of water area (Appendix C) (United States Census Bureau, 2025). The state is home to 81,573 miles of rivers, including the Missouri, Platte, and Niobrara Rivers, which accounts for 2.2% of the nation's total river mileage (Appendix A-1. Total Miles of Rivers and Streams in the Nation, n.d.). Nebraska's landscape is vast and diverse, consisting of expansive plains, rolling hills, and major river systems, which play a crucial role in agriculture and highlight the importance of soil and water conservation. As a major food-producing state, Nebraska relies on its open plains and rangelands to sustain its agricultural output (Encyclopædia Britannica, 2025). The state is divided into two main regions: the Central Lowland Plains and the Great Plains. Notably, the Sand Hills region consists of rolling hills and valleys. Nebraska's major rivers further emphasize the need for soil and water conservation efforts to preserve the state's natural resources and agricultural productivity.

State Policies

Nebraska has implemented state policies to manage invasive species through grant programs, research initiatives, and regulatory enforcement. The Nebraska Revised Statute 2-958.02 provides guidelines for invasive species management, including grant applications, funding priorities, and the formation of weed management entities (Nebraska Legislature, n.d.). This statute promotes applied research and encourages collaboration among organizations to combat invasive species effectively.

Nebraska Statute 37-1403 established the NISC, while Statute 37-1404 outlines its objectives, responsibilities, and authority (NISC, 2024). Under this legislation, the NGPC enforces regulations to prevent the spread of aquatic invasive species. These regulations prohibit the transportation of live aquatic invasives and restrict the introduction of non-domestic water into state water bodies (Nebraska Game & Parks, 2025). Further legislative efforts, such as the Noxious Weed Act, aim to "delineate responsibilities, encourage education of the public concerning noxious weeds, and provide the necessary authority to effectively control noxious weeds (Nebraska Legislature, n.d.).These policies reflect Nebraska's commitment to managing invasive species through research, regulation, and resource allocation.

Funding

Funding for invasive species management in Nebraska is distributed among multiple organizations, including the NISC, WMA, and the NGPC. In 2024, the NISC allocated over $400,000 for the management, surveying, sampling, mapping, and monitoring of aquatic invasive species across 311 miles of rivers and 140 bodies of water (NISC, 2024). Additionally, $1.7 million was directed toward terrestrial invasive species management. The NISC also collaborates with organizations such as the WMA and the NGPC to expand these efforts.

In 2023, Nebraska WMA spent $27,713.89 on noxious weed control and $750,000 on invasive plant and animal management (NISC, 2023). The NGPC invested $2.4 million in 2024 across 180 projects, including treatments for invasive species covering 75,000 acres (NISC, 2024). In 2023, the NGPC secured more funds for invasive species management, such as a $4 million National Fish and Wildlife Foundation grant to fund new positions, invasive species control initiatives, and habitat management projects.

The Nebraska Department of Agriculture (NDA) also supports invasive species management through its Riparian Vegetation Management Grant Program, which aims to enhance water conveyance by removing invasive species. This program provided $2.7 million in funding between 2022 and 2023 and $706,000 in 2023–2024 (NISC, 2024). With millions of dollars invested across multiple agencies, Nebraska continues to advance effective invasive species management strategies.

Control Methods

The state of Nebraska has a variety of control methods targeting invasive species. The NGPC completed 88 projects focused on removal efforts such as prescribed burning and herbicide applications (NISC, 2024) . One of the most challenging invasive species in Nebraska is Phragmites (Phragmites australis), which the NGPC and its partners combat primarily through chemical treatments.

Collaboration is a key aspect of Nebraska's invasive species management strategy. The NGPC works with 52 partner organizations, combining resources to enhance statewide efforts. Collectively, these organizations have treated thousands of acres, including 850 acres in state parks, 341.8 acres in state WMAs, 79 acres on Natural Resource District properties, and 37,015.2 acres of private land (NISC, 2024). Through strong partnerships and shared resources, Nebraska continues to mitigate the impact of invasive species across public and private lands.

Wyoming

Wyoming's diverse geography supports various invasive species, managed through comprehensive state policies including the Wyoming Aquatic Invasive Species Act and Weed and Pest Control Act. Management efforts are funded by state allocations and federal sources totaling nearly $3 million from the U.S. Fish & Wildlife Service (FWS) in 2023, with control strategies primarily relying on chemical methods, supplemented by biological controls like the Northern Tamarisk Beetle program for Saltcedar management.

State Context (Geography)

Wyoming, the 16th-largest state in the U.S., spans 97,809 square miles of land and 721 square miles of water area (Appendix C) (United States Census Bureau, 2025). The state is home to 108,767 miles of rivers, such as the Yellowstone, Snake, and Green Rivers, which account for 2.9% of the nation's total river mileage (*Appendix A-1. Total Miles of Rivers and Streams in the Nation*, n.d.). Wyoming's geography is diverse, featuring both the Rocky Mountains and the Great Plains, offering a unique natural beauty. Although Wyoming has the lowest population in the country, it is home to popular tourist destinations like Yellowstone and Grand Teton National Parks. The state's semi-arid climate, characterized by cold winters, warm summers, and low precipitation, makes it more suitable for livestock raising than crop farming (Lohrenz, 2023). Wyoming's varied terrains, including vast plains and mountainous regions, create ideal environments for a wide range of invasive species.

State Policies

Wyoming has implemented several state policies aimed at managing both aquatic and terrestrial invasive species, with a focus on prevention, inspection, and collaboration across multiple levels of government. In 2010, the state passed the Wyoming Aquatic Invasive Species Act, which made it illegal to introduce aquatic invasive species into state waterways. This act also requires watercraft to undergo inspections before they are allowed to enter state lakes or rivers (Animal Legal & Historical Center, 2025). Additionally, Wyoming's Aquatic Invasive Species Program mandates that boaters display a sticker confirming they have been cleared for entry into state waterways (Wyoming Legislature, 2022).

On the terrestrial side, Governor Mark Gordon initiated an invasive species program in 2019 to gain a deeper understanding of plant species in Wyoming. The initiative's final report emphasized the importance of collaboration among federal, state, and local governments to address invasive species challenges (Wyoming Weed & Pest Council, n.d.). Following the report's recommendations, the Wyoming legislature passed the Wyoming Weed and Pest Control Act, establishing the Wyoming Weed and Pest Council (Wyoming Legislature, 2021). This organization works with county weed and pest districts to implement management strategies, demonstrating the state's commitment to environmental protection.

Funding

Wyoming allocates significant funds for invasive species management from both state and federal sources. In 2023, the FWS allocated $2.96 million for invasive species management as part of a larger $455 million investment in ecosystem restoration projects (Citizen Portal, 2025). The state also funds Weed and Pest Control Districts, ensuring that funds are used effectively under the coordination of the Wyoming Weed and Pest Council (Wyoming Legislature, 2021).

Federal funding further supports Wyoming's efforts. In 2023, the FWS allotted $455 million to ecosystem restoration projects, with $2.96 million in funds going directly to invasive species management (USFWS, 2023). Additionally, landowners can apply for conservation innovation grants through the NRCS to support invasive species control projects (USDA NRCS, 2025).

Control Methods

To manage invasive species, Wyoming employs a variety of control methods with chemical control being the most common approach. Herbicides are applied to combat invasive plants like Cheatgrass (*Bromus tectorum*), Leafy Spurge (*Euphorbia esula*), and Russian olive (*Elaeagnus angustifolia*) (Amundson, 2015). While chemical methods are predominant, Wyoming also utilizes biological control in specific cases.

The most successful biological control effort has been the use of Northern Tamarisk Beetles (Diorhabda carintula) to control Saltcedar (Tamarix aphylla) overgrowth (Kauffman, 2005).Although biological control methods are limited in the state, federal initiatives, such as the Saltcedar project, have been beneficial. Moving forward, conservationists hope for more developments in biological control methods to supplement the state's management efforts. Overall, Wyoming's integrated approach—combining chemical, biological, and mechanical control methods—helps manage invasive species effectively across the state.

Montana

Montana manages invasive species through a collaborative framework involving the Montana Invasive Species Council (MISC) and the Department of Natural Resources and Conservation (DNRC), implementing strict aquatic invasive species regulations including mandatory watercraft inspections, with $278,580 in state funding for FY25 plus $5 million in conservation district support, addressing threats like non-native bullfrogs and flowering rush through public education, research, and various control methods costing livestock producers up to $40 per acre.

State Context (Geography)

Montana, the fourth-largest state in the U.S., spans 145,547.7 square miles of land and 1,493.8 square miles of water area (Appendix C) (United States Census Bureau, 2025). It is home to 176,750 miles of rivers, such as the Missouri, Yellowstone, and Milk Rivers, accounting for 4.8% of the nation's total river mileage (*Appendix A-1. Total Miles of Rivers and Streams in the Nation*, n.d.). Known as "Big Sky Country," Montana's vast open spaces and iconic mountain landscapes, such as the Rockies, define the state's natural beauty. Despite being the fourth-largest state, it has one of the lowest population densities in the U.S., with only 7.09 people per square mile (Montana Natural History Center, n.d.). Montana's geography is divided into three main regions: the eastern plains, western mountains, and the central front, each offering distinct ecosystems including montane forests and plains grasslands with sagebrush (University of Montana, n.d.). Although named after the Spanish word "montaña" meaning mountain, more than 60% of the state consists of grasslands and prairies, including the Badlands (Montana Natural History Center, n.d.).

State Policies

Montana has coordinated policies to combat the growing threat of invasive species across its ecosystems. Montana's approach to managing invasive species is collaborative, involving state organizations such as the MISC, the DNRC, and enforcement from the Montana Fish, Wildlife and Parks (MFWP), with a strong focus on controlling aquatic invasive species.

These entities combine prevention programs, grants, and local conservation districts to protect Montana's natural resources. The Montana Invasive Species Act of 2009 established the state's invasive species account and authorized inspection of vessels (Montana Legislature, 2009). The MFWP enforces Aquatic Invasive Species (AIS) laws and regulations. Key policies include mandatory inspections for all watercraft, decontamination requirements for boats with ballast tanks before entering specific bodies of water, and laws preventing the transport of AIS, such as live fish, into or within Montana. Violation of these regulations can result in fines up to $5,000 (Montana Fish, Wildlife & Parks, n.d.). Specific AIS-related rules according to the MFWP include:

- Aquatic Invasive Species Laws: A framework for detecting, controlling, and managing invasive species (80-7-1001 through 1019 MCA).
- Aquatic Invasive Species Rules: Regulations covering the prevention, inspection, and decontamination of AIS (ARM Rule 12.5.706).
- Flathead Basin Inspection Rules: Mandating inspection when launching into the Flathead Basin (ARM Rule 12.5.709).
- Fish Health and Import Laws: Requiring permits for fish imports, with inspection, quarantine, and disinfection protocols (87-3-209 through 87-3-277 MCA).

Montana, like all states, upholds federal laws like the Lacey Act, which prohibits the transport of injurious species without proper permits, punishable by fines or imprisonment (Montana Fish, Wildlife & Parks, 2022). Together, these coordinated efforts and comprehensive regulations reflect Montana's strong commitment to preserving its ecosystems and preventing the spread of invasive species.

Funding

Montana's invasive species prevention and control efforts are bolstered by dedicated funding from state agencies and substantial financial contributions from local conservation districts. The MISC works in partnership with the DNRC to secure funding for invasive species prevention and control. In FY25, the Montana legislature allocated $278,580 for invasive species programs, with the DNRC managing the grant process and the MISC overseeing the application process (Montana Invasive Species Council, 2024a). In Fiscal Year 2024, $250,722 was awarded in grants, with notable funding directed to projects like controlling non-native bullfrogs (Lithobates catesbeianus) in Flathead Valley and validating novel environmental DNA techniques at Flathead Lake (Montana Invasive Species Council, 2024a).

Additionally, Montana's 58 conservation districts, which provide technical and financial assistance to landowners, play a critical role in invasive species management.

Collectively, these districts provide over $5 million in annual donations and volunteer hours to support conservation efforts (Montana Association of Conservation Districts, n.d.). Together, these coordinated funding efforts ensure that Montana remains proactive and well-equipped in the ongoing fight against invasive species.

Control Methods

Managing invasive species in Montana requires a multifaceted and resource-intensive approach due to the diverse threats they pose to ecosystems, infrastructure, and agricultural communities. The state faces threats from various non-native wildlife, with the bullfrog being one of the most costly to control. Bullfrogs, which predate on native wildlife and carry chytrid fungus, have led to the launch of a removal project in western Montana (Montana Invasive Species Council, 2024b). For aquatic species, flowering rush (Butomus umbellatus) obstructs aquatic habitats, and zebra mussels damage infrastructure, both of which can be managed by cleaning watercraft and preventing ornamental releases into ponds (Clearwater Resource Council, n.d.). These challenges highlight the importance of ongoing prevention, early detection, and rapid response efforts to effectively manage invasive species and protect Montana's native ecosystems.

The Montana FWP plays a key role in public education through outreach programs that inform citizens about the risks of invasive species. Mandatory watercraft inspections have been in place since 2004, with inspection stations located along major highways and crossroads (Montana Fish, Wildlife & Parks, 2022). Strong partnerships have been established with local tribes and conservation districts to operate these inspection stations, ensuring thorough statewide coverage.

Additionally, research by the Montana State University in 2024 indicates that invasive species management costs can be substantial for livestock producers, with up to $40 per acre spent on controlling invasive plants, insects, and animals. Methods for control include targeted grazing, herbicide applications, and biological controls for pests (Montana State University, 2024). These findings emphasize the financial burden invasive species place on agricultural communities and the necessity of integrated management strategies to reduce long-term impacts.

South Dakota

South Dakota manages invasive species through prevention, containment, mitigation, and eradication strategies, supported by state policies and funding programs. The South Dakota Department of Agriculture and Natural Resources (DANR) and the Department of Game, Fish, and Parks (DGFP) oversee regulations addressing aquatic and terrestrial invasive species, while the state enforces restrictions on the transport of invasive species.

Funding from state grants and federal programs, such as the USDA's Conservation Innovation Grants (CIG), supports invasive species control. South Dakota employs diverse control methods, including mechanical removal, chemical treatments, prescribed burns, and targeted herbicide applications to protect its varied ecosystems.

State Context (Geography)

South Dakota, the 16th largest state in the U.S., spans 75,809.7 square miles of land and 1,306.4 square miles of water area (Appendix C) (United States Census Bureau, 2025). With a total of 9,937 miles of rivers, including the Missouri, Cheyenne, James, Big Sioux, and White Rivers, South Dakota accounts for 0.27% of the river mileage in the United States (Appendix A-1. Total Miles of Rivers and Streams in the Nation, n.d.). The state's diverse geography ranges from the fertile plains of the east, ideal for agriculture, to the Missouri River in the central region, which serves as a natural boundary between the eastern and western parts of the state (South Dakota Maps & Facts, 2021). The western region is home to the Black Hills, a forested mountain range with towering peaks, including the highest point in the state, Black Elk Peak. (South Dakota Maps & Facts, 2021). The state's diverse geography contributes to its wide variety of ecosystems, wildlife, and invasive species.

State Policies

South Dakota tackles invasive species through a combination of prevention, eradication, and management policies. The DANR offers guidelines on cleaning recreational equipment, planting native species in gardens, and using weed-free forage in agricultural areas to reduce the spread of non-native species (*South Dakota Plant Protection and Invasive Species*, 2020). The DGFP has developed an Aquatic Invasive Species (AIS) Strategic Plan, which is based on four key components:

1. Prevention: Regulations to slow the introduction of AIS into the state (Robling et al., 2023).
2. Containment: Sampling of water bodies to determine AIS population locations (Robling et al., 2023).
3. Mitigation: Identifying methods to deter AIS from entering water bodies (Robling et al., 2023)
4. Eradication: Eliminating AIS populations when feasible (Robling et al., 2023).

On land, the South Dakota Public Utilities Commission oversees the South Dakota Noxious Weed Management Plan, which aims to prevent and eradicate invasive plant species. (Appendix 17 -South Dakota Noxious Weeds Management Plan, 2024). The state also enforces regulations, including Chapter 41:10:04, which sets restrictions on the transport of certain fish and crayfish species to prevent their spread (South Dakota Legislature, n.d.).

These rules list 13 invasive fish species, 8 invasive aquatic plants, and 8 invasive aquatic invertebrates (South Dakota Legislature, n.d.) Collectively, these efforts help safeguard South Dakota's natural resources from the threat of invasive species.

Funding

South Dakota funds invasive species management through a combination of state appropriations, federal grants, and collaborative programs. The DANR administers the Weed and Pest Control grant program, which provides financial assistance to county weed and pest boards for invasive species management, including eradication efforts, educational programs, and research initiatives (South Dakota Weed and Pest Commission, 2023). On the federal level, South Dakota receives funding from the USDA's CIG, which supports natural resource conservation, including invasive species management (Natural Resource Conservation Service, 2025). In 2024, six South Dakota projects received a total of $82.7 million from these grants to advance conservation efforts (Natural Resource Conservation Service, 2024). These diverse funding sources allow the state to implement a wide array of invasive species management strategies.

Control Methods

South Dakota employs a variety of control methods tailored to the specific environments where invasive species are found. In South Dakota's grasslands and prairies, common strategies include mechanical removal, chemical treatments, grazing, and prescribed burns (Bauman, 2025). In the Black Hills National Forest, weed management focuses on ground-based herbicide treatments, while at Wind Cave National Park, chemical spraying is used with carefully selected herbicides to minimize impacts on caves and water resources (USDA Forest Service, 2023; U.S. National Parks Service, 2023). These targeted and region-specific approaches help protect the state's diverse ecosystems from the damage caused by invasive species.

North Dakota

North Dakota, covering nearly 69,000 square miles with diverse geography across three distinct regions, manages invasive species through the North Dakota Game and Fish Department (NDGFD)'s Aquatic Nuisance Species Management Plan focusing on coordination, education, prevention, and early detection, funded by approximately $600,000 annually from State Wildlife Grants (SWG), with control methods including chemical treatments, biological controls like flea beetles for leafy spurge, and public education initiatives.

State Context (Geography)

North Dakota, the 17th largest state in the U.S., covers 68,994.8 square miles of land and 1,703.2 square miles of water area (Appendix C) (United States Census Bureau, 2025).

The state has 54,373 miles of rivers, including the Missouri, James, Red, Yellowstone, and North Fork Grand Rivers, making up 1.48% of the total river mileage in the United States (Appendix A-1. Total Miles of Rivers and Streams in the Nation, n.d.). North Dakota's geography is divided into three regions: the Red River Valley, Drift Prairie, and Missouri Plateau. The Red River Valley, in the eastern part of the state, is a flat, fertile plain created by the ancient glacial Lake Agassiz, making it ideal for agriculture (Geography and Climate of North Dakota, n.d.). The Missouri Plateau in the western part of the state is characterized by badlands, a rugged, eroded terrain (Geography and Climate of North Dakota, n.d.). Between the two regions lies the Drift Prairie, a rolling landscape dotted with lakes and streams (Geography and Climate of North Dakota, n.d.). This diverse topography influences the state's climate, natural resources, and land use patterns.

State Policies

North Dakota manages invasive species through a combination of prevention, control, and mitigation policies to protect its ecosystems and economy. The NDGFD oversees these efforts through its Aquatic Nuisance Species Management Plan (Howell, 2018). The plan outlines four key objectives:

1. Coordination and Communication: Collaboration among state, federal, local, and private agencies is essential (Howell, 2018).
2. Education and Outreach: Providing the right information at the right time is crucial for preventing invasive species (Howell, 2018).
3. Prevention and Control: Policies and regulations are in place to manage invasive species (Howell, 2018).
4. Sampling and Modeling: Early detection of new invasive species populations enables timely planning for mitigation (Howell, 2018).

The NDGFD also oversees the Aquatic Nuisance Species Committee, which includes state agencies and private entities working together on invasive species management. On land, the North Dakota Department of Agriculture (NDDA) implements the state's Noxious Weed Law and Regulations, which aim to control and eradicate invasive weeds (North Dakota's Noxious Weed Law and Regulations, 2021). Additionally, the NRCS provides technical assistance and financial support for conservation practices on private lands to address invasive species and promote the use of native plants in restoration projects (Invasive Species- North Dakota, 2025). These coordinated efforts across multiple agencies and sectors reflect North Dakota's comprehensive and proactive strategy to safeguard its natural resources from the growing threat of invasive species.

Funding

North Dakota funds invasive species management through federal grants and state programs. The NDGFD has received approximately $600,000 annually since 2001 through the SWG program, supporting conservation efforts (State Wildlife Grants, 2025). The NRCS also offers financial assistance through the EQIP, which encourages conservation practices that address invasive species (Environmental Quality Incentives Program, 2025). Additionally, federal partnerships, such as those with the BLM, provide funding for invasive species management on both public and private lands in the state (Invasive Species Control on Public Lands in Montana, North Dakota and South Dakota - Federal Grant, 2025). These funding sources enable North Dakota to implement effective invasive species management strategies across diverse landscapes.

Control Methods

North Dakota employs a range of control methods for invasive species, including chemical, mechanical, and biological strategies to protect its ecosystems. For example, Theodore Roosevelt National Park uses a combination of chemical and biological control methods to manage leafy spurge, a highly competitive invasive plant (Nonnative Species - Theodore Roosevelt National Park, 2024). Chemical control includes ground and aerial herbicide treatments, while biological control involves the use of flea beetles that lay eggs on the plant's roots, helping to reduce its spread (Nonnative Species - Theodore Roosevelt National Park, 2024). In addition to these methods, public education and regulations to prevent the introduction of invasive species are crucial components of the state's management efforts (Invasive Species | NDGFD, 2025). Together, these diverse control strategies and preventive measures underscore North Dakota's commitment to preserving its landscapes through adaptive and science-based invasive species management.

Findings & Recommendations

Findings

Research Findings

The distribution of conservation-related entities varies significantly across states. Texas has the most conservation entities, while Montana and Colorado also have high numbers in specific areas. Nebraska, Wyoming, and New Mexico have fewer entities overall. Adjusted counts show Montana is above average in many categories, while Nebraska and New Mexico are below average. Larger states tend to have more Conservation Associations and Districts, but Wildlife Management Areas don't follow this pattern. Federal and native-managed sites add complexity to conservation efforts.

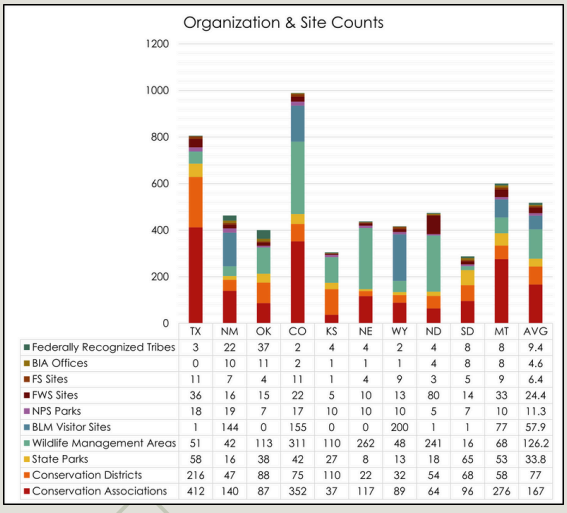
The raw organization counts reveal significant variation in the distribution of conservation-related entities across the ten states. Texas reports the highest counts in nearly every category, including Conservation Associations, Conservation Districts, and State Parks. Montana and Colorado also report high numbers in specific areas, particularly Wildlife Management Areas, where Montana stands out with a substantially larger count to other states in the region. In contrast, states such as Nebraska, Wyoming, and New Mexico consistently report lower raw counts across multiple categories.

When viewed through the lens of adjusted counts - measuring each state's figures relative to the sample average - these differences become more apparent. As seen in Figure 2, Montana ranks above average in several categories, particularly those associated with land-based conservation. Meanwhile, states like Nebraska and New Mexico fall below average in most categories. The use of adjusted counts provides a standardized baseline for comparing organizational presence, helping to identify patterns not immediately visible in raw totals.

Correlation analysis further clarifies the relationship between organizational counts and state-level characteristics. Conservation Associations and Conservation Districts show strong positive correlations with both population and land area (Appendix E), indicating that these organization types tend to be numerous in more populous and larger states. In contrast, Wildlife Management Areas are negatively correlated with both variables, suggesting a distribution pattern influenced by factors not captured by population or geographic size alone. Outliers such as Montana—where counts are high despite a smaller population—highlight the influence of additional, unmeasured factors. The inclusion of federal and native-managed sites adds further complexity, reflecting the varied governance structures that shape conservation efforts across the region. Together, these findings provide a clearer understanding of where conservation resources are concentrated and point to the need for deeper analysis into the factors driving organizational presence.

Figure 2

Organization & Site Counts



	TX	NM	OK	CO	KS	NE	WY	ND	SD	MT	AVG
Federally Recognized Tribes	3	22	37	2	4	4	2	4	8	8	9.4
BIA Offices	0	10	11	2	1	1	1	4	8	8	4.6
FS Sites	11	7	4	11	1	4	9	3	5	9	6.4
FWS Sites	36	16	15	22	5	10	13	80	14	33	24.4
NPS Parks	18	19	7	17	10	10	10	5	7	10	11.3
BLM Visitor Sites	1	144	0	155	0	0	200	1	1	77	57.9
Wildlife Management Areas	51	42	113	311	110	262	48	241	16	68	126.2
State Parks	58	16	38	42	27	8	13	18	65	53	33.8
Conservation Districts	216	47	88	75	110	22	32	54	68	58	77
Conservation Associations	412	140	87	352	37	117	89	64	96	276	167

Note. All organizations who work on conservation in their respective state.

Survey Findings

A survey distributed to 927 organizations in Texas received responses from 39 organizations, with the majority coming from private, non-profit conservation associations (38%) and Soil and Water Conservation Districts (15%). Municipal governments accounted for 13% of the responses, while both State Parks and State Wildlife Management Areas each contributed 10%. Due to missing data, the proportion of responses from Wildlife Management Associations and other organizations could not be determined. Additionally, some organizations included in the Texas survey were excluded from the state-level comparison analysis due to categorization inconsistencies.

The survey results revealed that invasive species management in Texas is heavily focused on terrestrial environments. Of the 99 invasive species identified by respondents, 83 were terrestrial and 16 aquatic. Moreover, plant species were managed more frequently than animal species across both environments. Among terrestrial species, 68 were plants and 15 were animals, while aquatic species included 13 plants and only 3 animals. These findings emphasize the predominance of terrestrial plant species in current invasive species management efforts.

Organizations generally expressed confidence in their ability to manage invasive species. When asked to rate their effectiveness on a scale from “somewhat disagree” to “strongly agree,” 55% of respondents selected “somewhat agree,” followed by 27% who chose “strongly agree.” Nine percent responded with “neutral,” and another 9% with “somewhat disagree,” while no organization reported being entirely ineffective. These responses suggest a broadly positive self-assessment of management capabilities. Despite this confidence, organizations reported facing several significant challenges. The most frequently cited constraint was funding, identified by 41% of respondents, followed by labor shortages at 25%. Limited workforce capacity hinders the ability to carry out management tasks effectively. Additionally, 18% of organizations noted a lack of expertise as a barrier, reflecting the need for specialized knowledge in invasive species control. Time limitations were also reported, with 16% citing time as a major constraint. Addressing these financial, labor, expertise, and time-related challenges is essential for enhancing the effectiveness of invasive species management across Texas.

Recommendations

To improve invasive species management across the Great Plains, several key initiatives should be implemented. First, expanding the initial Texas survey to all ten Great Plains states will provide a more comprehensive understanding of the region’s invasive species challenges.

Tailoring the survey to improve participation, particularly from smaller and underrepresented Soil and Water Conservation Districts (SWCDs), by simplifying language and reducing reporting burdens is essential. Second, establishing a regional coordination platform, such as a digital hub or an annual summit, would facilitate knowledge exchange and collaboration among agencies, tribal nations, and conservation organizations, leading to more effective responses to cross-border species threats. Third, advocating for more flexible and equitable funding streams is crucial to address regional disparities in invasive species management. Providing grant programs that prioritize underserved districts and allow for more tailored solutions will enhance resource distribution.

Additionally, strengthening collaboration with tribal governments and local entities is vital for effective governance. Oklahoma's integration of tribal conservation districts serves as a model for fostering formal partnerships with tribal nations, who hold significant land and ecological knowledge. Improved communication between state agencies and local organizations like SWCDs will streamline operations and clarify roles. Promoting integrated and ecosystem-specific control strategies, such as the use of biological, mechanical, chemical, and cultural controls, will ensure that interventions are both ecologically sound and cost-effective across varying landscapes. Expanding public education and prevention efforts, particularly through regional campaigns focused on high-risk behaviors like the movement of watercraft and firewood, will also contribute to early detection and prevention. Finally, developing standardized performance metrics and best practice guidelines will help track the success of invasive species management programs across the region, improve accountability, and facilitate comparisons between states. A shared framework and a guide of effective strategies will serve as valuable resources for conservation professionals and policymakers.

The Great Plains faces a significant challenge in managing invasive species, but states are actively working to address this issue through a combination of policy, funding, and collaborative efforts. By enhancing collaboration efforts, the region can continue to refine its approach to managing invasive species and protect its diverse ecosystems for future generations.

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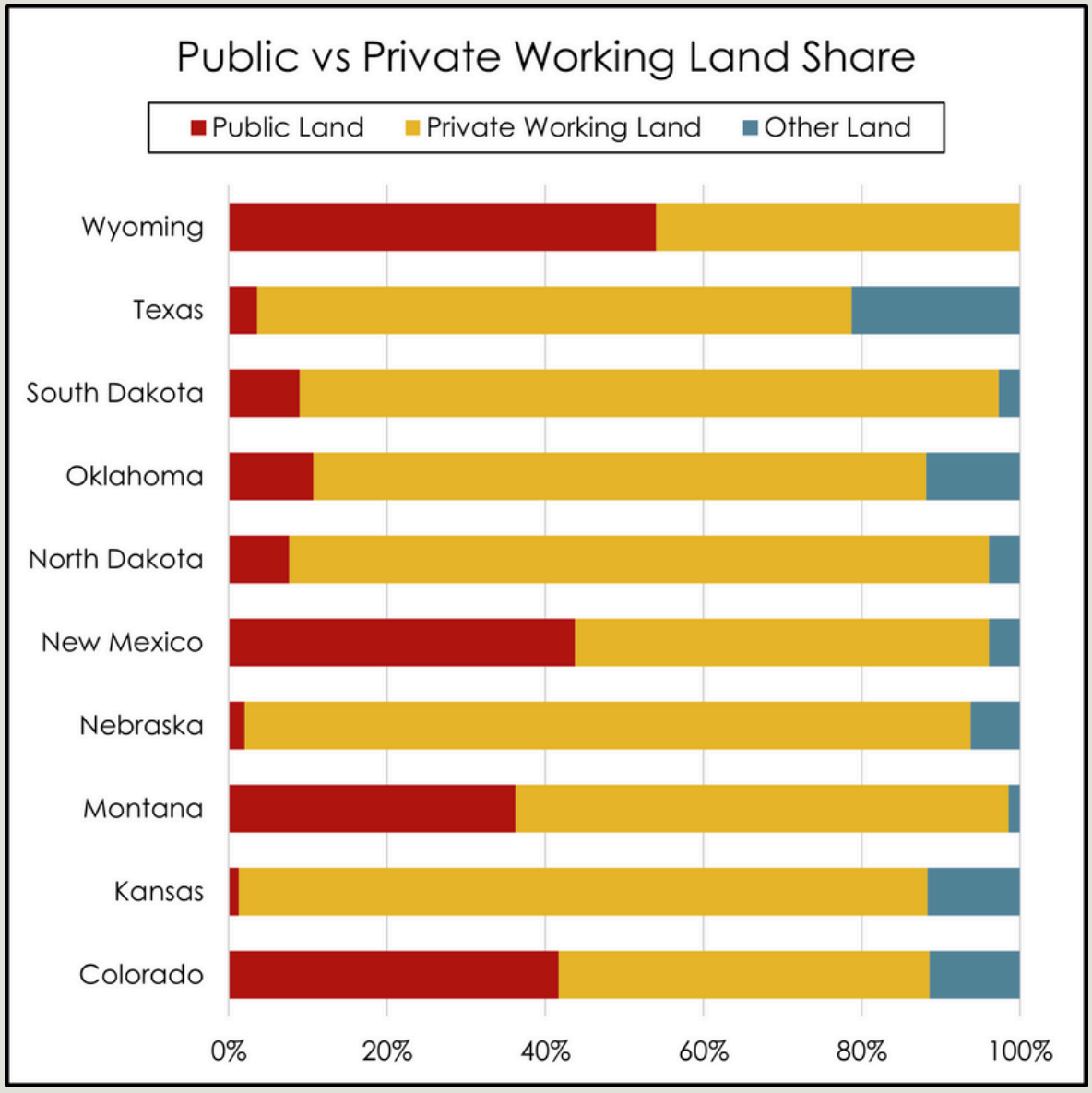
Appendix A

Public vs. Private Working Land Share



Appendix B

Comparison of Organization Names Across 10 Great Plains States.

State	Wildlife Department	Conservation District	River Authority	Wildlife Management Area
Texas	TPWD	SWCD	River Authorities	WMA
New Mexico	NMDGF	SWCD	ISC, The Pecos River Commission, AMAFCA	WMA
Oklahoma	ODWC	CD		WMA
Colorado	CPWD	CD	Major River Basins	State Wildlife Area
Kansas	KDWP	CD	River Authorities	Wildlife Area
Nebraska	NGPC	NRD	River Basins	WMA
Wyoming	WGFD	CD		WHMA
Montana	FWP	SWCD	FWP and DNRC	WMA
South Dakota	DGFP	CD	River Authorities	WMA
North Dakota	NDGFD	SCD	DWR	WMA

Note. Acronyms can be found in the glossary at the beginning of the report.

Appendix C

States by Sq. Miles

State Area (Sq. Miles)

State	Land	Water	Total
Texas	261,263	7,322	268,585
New Mexico	121,312	281	121,593
Oklahoma	68,595	1,303	69,898
Colorado	103,637	457	104,094
Kansas	81,758	519	82,277
Nebraska	76,816	530	77,346
Wyoming	97,089	721	97,810
Montana	145,547	1,493	147,040
South Dakota	75,809	1,306	77,115
North Dakota	68,994	1,703	70,697

Appendix D

Carrizo Cane Case Study

Introduction

Carrizo Cane (Arundo donax), also known as Elephant Grass and Giant Reed, has become one of the most invasive grasses in Texas. This bamboo-like perennial grass can grow between 20 and 30 feet tall (Species Profile - Giantreed, 2017). It has large, flat leaves that can span up to 1.5 feet with a plume-like panicle inflorescence that can grow up to 3 feet long (Plant Image Gallery, 2024). The plant's root system consists of fibrous, lateral rhizomes and deep roots that are difficult to uproot (Field Guide for Managing Giant Reed in the Southwest United States Department of Agriculture, 2014). Carrizo Cane is considered an invasive plant because it is not originally from the United States and negatively impacts the environment.

History of Carrizo Cane

Carrizo Cane was introduced by colonists in the 1500s to be used in construction as roofing (Goolsby et al., 2017). The Carrizo Cane plant originated from the Mediterranean region, Northern Africa, and parts of Asia where it was used to make wind instruments, fishing rods, and baskets (Plant Image Gallery, 2024). It was introduced to Texas after being transported from Europe's Iberian Peninsula and spread across the U.S.-Mexico border (Razing Cane | Homeland Security, 2024). Currently, Carrizo Cane is listed as a nonindigenous plant and considered a threat in 10 states; Arizona, California, Hawaii, Maryland, Nevada, New Jersey, New Mexico, North Carolina, Texas, as well as Washington D.C. (Species Profile - Giantreed, 2017). The plant was originally identified as a threat to Texas as early as 1852 but is still spreading through southern states where soils are wet and warm (Species Profile - Giantreed, 2017). Despite its historical uses, Carrizo Cane continues to pose a significant ecological threat, with its spread across southern states highlighting the ongoing challenges of managing invasive species.

The Security and Environmental Issue

Carrizo Cane has become both a security and an environmental concern, especially in Texas. The plant causes problems for both Homeland Security and the Texas government by reducing visibility for border agents (Razing Cane | Homeland Security, 2024). Due to its ability to grow up to 25 feet tall, it can easily conceal a person trying to cross the border (Rio Grande Carrizo Cane Eradication Program | Texas State Soil and Water Conservation Board, n.d.).

Carrizo Cane also negatively impacts the ecosystems through its high-water consumption by depleting the soil of moisture, leaving none for the native plants (Rio Grande Carrizo Cane Eradication Program | Texas State Soil and Water Conservation Board, n.d.). It thrives in warm, water-rich environments in the South along riverbanks. This invasive species siphons $12,000 worth of water annually, an amount that could be used to supply water to 190,000 people (Giant Reed, n.d.). The growing presence of Carrizo Cane highlights the urgent need for effective management strategies to mitigate its environmental and security-related impacts in the region.

Texas Management for Carrizo Cane

Three methods have been used to eradicate Carrizo Cane: herbicide, controlled burning, and biological controls. Both herbicide use and burning have adverse environmental effects. Biological controls have become more popular since 2009 when Arundo Wasps (*Tetremesa romana*) were introduced to the United States (USDA, 2009). These insects are native to the Mediterranean, Northern Africa, and Asia, the same native regions as Carrizo Cane. Arundo Wasps have been effective as they do not have any negative impacts on the environment, economy, or human health. The Texas government became aware of the issues caused by the plant in 2016 and created a Border Security Plan that requested $10 million to eradicate Carrizo Cane (Aguilar, 2016). So far, the Arundo Wasps have slowed the spread of Carrizo Cane, but continued research is necessary to ensure they do not become invasive themselves.

Appendix E

Correlation Coefficients - Organization and Site Counts

Correlation Coefficients

Category	Population	Total Area (sq mi)	Public Land %
Conservation Associations	0.71	0.80	0.20
Conservation Districts	0.91	0.77	-0.41
State Parks	0.43	0.45	-0.16
Wildlife Management Areas	-0.16	-0.34	-0.14
BLM Visitor Sites	-0.23	0.01	0.97
NPS Parks	0.54	0.64	0.39
FWS Sites	0.13	0.15	-0.15
FS Sites	0.48	0.67	0.62
BIA Offices	-0.38	-0.27	0.16
Federally Recognized Tribes	-0.15	-0.21	0.00