NORTH DAKOTA DEPARTMENT OF AGRICULTURE

NORTH DAKOTA ENDANGERED SPECIES PROTECTION PLAN FOR PESTICIDES

Submitted to:

United States Environmental Protection Agency

October 5, 2018

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Acronyms

EPA ..... Environmental Protection Agency
ESA ..... Endangered Species Act of 1973
ESPP ..... EPA's Endangered Species Protection Plan
FRN ..... Federal Register Notice
FIFRA ..... Federal Insecticide Fungicide and Rodenticide Act
GIS ..... Geographic Information System
NDASS ..... North Dakota Agriculture Statistics Service
NDDA ..... North Dakota Department of Agriculture
NDSU Extension ..... North Dakota State University Extension Service
NMFS ..... National Marine Fisheries Service
QAPP ..... Quality Assurance Project Plan
TNC ..... The Nature Conservancy
TP DMS ..... Least Tern and Piping Plover Data Management System
USFWS ..... United States Fish and Wildlife Service

INTRODUCTION

The North Dakota Department of Agriculture is committed to ensuring human safety and protecting the environment through the regulation of pesticide sales, distribution, storage and use. In addition, the NDDA acknowledges the critical role that pesticides play in producing high quality food and controlling economically important pests.

Concerns have been raised with how well government agencies regulating pesticides are protecting wildlife designated as threatened or endangered under the Endangered Species Act (ESA). In response to those concerns, the North Dakota Department of Agriculture (NDDA) has developed this plan to better protect threatened and endangered species from pesticides.

The NDDA's goal is to better protect the state's listed species while minimizing the economic impact to agriculture. To facilitate this goal, NDDA has developed a state initiated endangered species protection plan to better assess and mitigate the risk of pesticides to the listed species found in North Dakota. NDDA believes that by providing geographically specific data on pesticide use and fate in the environment, the United State Environmental Protection Agency (EPA) will have the best available data to make sound scientific decisions. Furthermore, access by EPA to the data will ensure that any measures to mitigate the risk of pesticide use to listed species will be both protective and reasonable.

The "North Dakota Endangered Species Protection Plan for Pesticides" has three main goals:

1. To supply the EPA with state specific information to use in risk assessments,
2. To provide a platform for stakeholders to offer input and recommendations, and
3. To help plan and implement mitigation and management plans, including Endangered Species Protection Bulletin (Bulletins)

NDDA's goal is to develop a plan that is both protective of North Dakota listed species and reasonable for pesticide users.

BACKGROUND

Endangered Species in North Dakota

The United States Fish and Wildlife Service (USFWS) has listed twelve species in North Dakota as threatened or endangered (hereafter called "listed") under the federal Endangered Species Act (ESA) of 1973 (Table 1). The listed species include four birds, the piping plover (*Charadrius melodus*), least tern (*Sterna antillarum*), whooping crane

(*Grus americana*), and rufa red knot (*Calidris canutus rufa*). There are three listed mammals, the black-footed ferret (*Mustela nigripes*), gray wolf (*Canis lupus*) and northern long-eared bat (*Myotis septentrionalis*). One fish species is listed, the pallid sturgeon (*Scaphirhynchus albus*). There are three invertebrates the poweshiek skipperling (*Oarisma poweshiek*), Dakota skipper (*Hesperia dacotae*) and the rusty patched bumble bee (*Bombus affinis*) and one plant, the western prairie-fringed orchid (*Plantanthera praeclara*).

Table 1. Threatened and Endangered Species of North Dakota

Species name	Common Name	Description	Status
Charadrius melodus	piping plover	Bird	Threatened
Sterna antillarum	least tern	Bird	Endangered
Grus americana	whooping crane	Bird	Endangered
Calidris canutus rufa	Rufa red knot	Bird	Threatened
Mustela nigripes	black-footed ferret	Mammal	Endangered
Canis lupus	gray wolf	Mammal	Threatened
Myotis septentrionalis	Northern long-eared bat	Mammal	Threatened
Scaphirhynchus albus	pallid sturgeon	Fish	Endangered
Oarisma poweshiek	poweshiek skipperling	Invertebrate	Endangered
Hesperia dacotae	Dakota skipper	Invertebrate	Threatened
Bombus affinis	rusty-patched bumble bee	Invertebrate	Endangered
Plantanthera praeclara	western prairie fringed orchid	Plant	Threatened

The importance of North Dakota habitat varies widely amongst the twelve listed species (Figure 1). Some of the species are found only in localized regions of the state, while others reside in North Dakota for only short periods of time each year.

Seven of the twelve listed species (the black-footed ferret, whooping crane, rufa red knot, gray wolf, northern long-eared bat, rusty patched bumble bee and poweshiek skipperling) have limited distribution in North Dakota; therefore, they have limited focus in the North Dakota Endangered Species Protection Program. However, the EPA will use all twelve species when performing risk assessments.

Black-footed ferrets have historic range and potential habitat in the southwestern region of the state (Figure 2). However, black-footed ferrets have not had a documented occurrence in the state for more than thirty years.

Whooping cranes and rufa red knots have short stops statewide during migration in the spring (late April to mid-June) and fall (late September to mid-October), (Figure 3). During these migratory periods, both species may reside in North Dakota for a few weeks.

Gray wolves are infrequent visitors to the state. Likely habitat for the gray wolf in North Dakota is the forested areas in north central and northeast North Dakota; however, they may appear anywhere. Gray wolves are currently federally listed everywhere in North Dakota.

Little is known about northern long-eared bat abundance in North Dakota. There is a research project that is studying roosting habitat and abundance of bat species in North Dakota that will conclude in 2019. Current information suggests there is minimal to no northern long-eared bat hibernacula in North Dakota. If present, individuals could overwinter in small rock crevices in the badlands in southwestern ND. Northern long-eared bats may also use wooded areas along river corridors and forested areas for summer habitat.

The rusty patched bumble bee is a bumble bee species native to Eastern North America. Workers and males have a small rust-colored patch on the middle of their second abdominal segment. Historical distribution included southeastern North Dakota however, no individuals have been identified in North Dakota since the early 2000s.

The Poweshiek skipperling is a small butterfly with a wing-span of about 1 inch. It is dark brown above with some light orange along the wing margins and a lighter orange head. The underside of the wings, which can be seen when it's at rest, are dark to light brown with very prominent white veins that may make the wing look striped. Poweshiek skipperlings are most often found in native prairie remnants. Based on recent surveys there are no known poweshiek skipperlings in North Dakota.

While these species are federally-listed species and important components of certain ecosystems, their lack of abundance and extremely limited distribution in the state will make it difficult or impossible to mitigate the risk of pesticides to them. In addition, our efforts would likely be better spent focusing on those species that are at higher risk of pesticide exposure in the state. Therefore, management efforts will be focused on listed species that are year-long residents and/or reproduce in the state.

Biology, distribution, and sensitivity of year-long resident listed species

Five listed species are year-long residents and/or reproduce in North Dakota (piping plover, least tern, pallid sturgeon, Dakota skipper, and western prairie-fringed orchid), and these five will be the focal species in the North Dakota Endangered Species Protection Program.

Least tern

(Photo by: USFWS/S. Maslowski)

Least terns are the smallest members of the gull and tern family. They are approximately 9 inches in length, with a black head, and gray on the wings, back and tail with a white underside. Their tails are forked, and their wings are narrow and pointed, making them very suitable for dramatic dives while foraging for small fish, their primary food source. The birds breed from May to August in North Dakota and then migrate to the Gulf of Mexico and Caribbean for the winter.

In North Dakota, least terns are found exclusively on the Missouri River system (Figure 2). They prefer sparsely vegetated sandbars, which have been reduced due to damming and channelization.

Piping plover

(Photo by: USFWS/Gene Nieminen)

Piping plovers are small shore birds measuring about 6 ½- 7 inches long. They are brown on their back, wings and top of their head with a white underside and distinctive black band across their chest and forehead. Piping plovers feed on open beaches on insects and small crustaceans. The breeding season for piping plovers is April through August. After breeding the population migrates to the Gulf of Mexico.

Piping plovers are found on the Missouri River system and on alkali lakes in the northwest and central region of the state (Figure 6). Plovers are threatened by a loss of sandbars and water fluctuations due to damming on the Missouri River system. Nest predator increases in recent decades threaten the plovers on both the Missouri River and alkali lakes.

Little is known about the least tern and piping plover's sensitivity to pesticides. Mierzykowski and Carr and Allen et al. did studies on a limited number of pesticides in piping plover and/or least tern eggs in Maine and Oklahoma respectively (1998, 2004). Both examined eggs shells for organochlorines and inorganic elements. Pesticides were not found or were well below ecological effects levels.

Pallid sturgeon

(Photo by: U.S. Fish & Wildlife Service)

Pallid sturgeon are prehistoric fish armored with rows of bony plates that run lengthwise from head to tail. They are a large, grayish white grayish white in color, and can weigh up to 80 pounds and live up to 60 years. Pallid sturgeon feed on insects, crustaceans and small fish. Pallid sturgeon do not reach sexual maturity until they are 7 to 12 years of age. There is little evidence of natural reproduction in the last 50 years, and it is believed that this lack of reproductive success is due to both a lack of spring river pulses that cue spawning and the existences of dams that cut off access to spawning grounds. Pallid sturgeon populations are currently augmented by artificial propagation.

Pallid sturgeon are found exclusively in the Missouri River system in North Dakota (Figure 7). They are adapted to large shallow rivers with gravel, sandbars and seasonal pulses, which is what the Missouri River was before widespread damming and stabilization efforts damaged pallid sturgeon habitat.

Little research has been done on the effects of pesticides on pallid sturgeon. Pallid sturgeon have a long egg maturation cycle, and Conte et al. suggested that this long cycle may make them susceptible to have pesticides concentrated in their eggs (1988). A study by Ruelle and Keenlyne in 1992 in North Dakota and Nebraska detected pesticides in tissue of pallid sturgeon, but the effects of these pesticide levels was unknown. The pesticides (chlordane, DDT, and dieldrin) found in the pallid sturgeon during the study are currently banned or cancelled. Research on white sturgeon shows that elevated pesticide levels in tissue is correlated with lower condition factors, gonadal abnormalities, and hermaphrodism (Feist et al. 2005).

Western prairie fringed orchid

(Photo by: U.S. Fish & Wildlife Service)

The western prairie-fringed orchid is a perennial plant with large white flowers that have fringes on the margins giving them a feathery appearance. The orchids grow up to three feet tall. The orchid flowers in June and July and is pollinated by hawk moths.

The preferred habitat of the western prairie-fringed orchid is moist, tall grass prairie. The orchid occurs in two counties in the southeast corner of the state in remnant high quality prairie (Figure 8). The conversion of prairie to cropland is the main reason for the orchid's decline. Herbicides may have negative effects on orchids, as may leafy spurge and other noxious weeds.

The issue of pesticides and western prairie-fringed orchids is complex because of the threat of leafy spurge invasion to orchid habitat. Herbicides may reduce leafy spurge but harm orchids; however, a study by Erickson (2006) showed that at least one type of herbicide is effective in controlling leafy spurge and does not harm orchids.

Dakota skipper

Photo: Male Dakota skipper, Minnesota zoo/Erik Runquist

The Dakota skipper is a small butterfly with a one-inch wingspan. It has a thick body and a faster, more powerful flight than most butterflies. The upper side of the male's wing is tawny-orange to brown with a prominent mark on the forewing; the lower surface is dusty yellow-orange. The upper side of the female's wing is darker brown with tawny-orange spots and a few white spots on the forewing margin; the lower side is gray-brown with a faint white spot band across the middle.

Dakota skippers live in two types of prairies. One type is moist bluestem prairie in which three wildflower species are usually blooming when Dakota skippers are adults: wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*) and smooth camas (*Zygadenus elegans*). The second type is upland prairie that is relatively dry and often found on ridges and hillsides. Bluestem grasses and needlegrasses dominate these prairies; purple coneflower (*Echinacea angustifolia*) is typical of high quality sites that support this skipper, although it also uses other flowers for nectar.

Dakota skippers have four basic life stages: egg, larva, pupa and adult. During the brief adult period in June and July, females lay eggs on the underside of leaves. Eggs take about 10 days to hatch into larvae (caterpillar). After hatching, larvae build shelters at or below the ground surface and emerge at night to feed on grass leaves. This continues until fall when larvae become dormant. They overwinter in shelters at or just below ground level, usually in the base of native bunchgrasses. The following spring, larvae emerge to continue developing. Pupation takes about 10 days and usually happens in June.

Adult males emerge from pupae about five days before females, and the adults live for three weeks, at most. This brief period is the only time that Dakota skippers can reproduce. If a female Dakota skipper lives for the full three weeks and adequate flowers for nectar are available, she may lay up to 250 eggs. Nectar, providing both water and food, is crucial for survival of both sexes during the adult flight period, which often occurs during the hottest part of summer.

Agriculture in North Dakota

Agriculture is North Dakota's number one industry and a very important sector of North Dakota's economy. Agriculture generates approximately $8.6 billion in cash receipts annually. Nearly one-fourth of the jobs in the state are related to agriculture, and 89 percent of North Dakota's land area is in farms and ranches.

Dynamic, diverse and constantly changing, agriculture is also important to our nation's economy and security. North Dakota leads the United States in the production of more than a dozen different commodities, including small grains, oilseeds and pulse crops.

North Dakota is divided into three main geographical and agricultural areas. Along North Dakota's eastern border is the Red River Valley. This valley was formed by sedimentation on the floor of Lake Agassiz which resulted in a flat, fertile, plain that is one of the world's richest agricultural production regions. A century ago, wheat was the leading crop of the Red River Valley. Today, wheat is still important, but much of this land is now sown with edible beans, soybeans, potatoes, sugar beets and corn.

In the midsection, the land is known as the prairie pothole or central coteau region. This area is covered by shallow wetlands formed by glaciers. This region is very diverse in crops with many growers rotating small grains like spring wheat, durum and barley, with sunflowers, canola, dry beans, dry peas, soybeans and corn.

The landscape and the agriculture change dramatically on the western side of the Missouri River. This region is drier and less fertile. In the high plains of southwest North Dakota, cattle are the predominant form of agriculture. North Dakota's livestock industry is largely centered on cow-calf production, but producers also enjoy an enviable reputation for the quality of their purebred cattle. Due to significantly lower levels of precipitation in the western third of North Dakota, many crops are grown in no-tillage or dry land production systems. Major crops in the west include small grains, flax and some corn varieties.

Pesticide Use in North Dakota

When used properly, pesticides play an important role in managing pests without posing a risk of unreasonable adverse effects to human health or the environment. According to the last survey of ND pesticide users that occurred in 2012, pesticides were applied to more than 21 million acres each year out of the 38 million acres planted in the state (Zollinger et al. 2014). Herbicides were applied one or more times to 57.3 percent of agricultural land in ND in 2012, while fungicides and insecticides were applied to 21.6 percent and 10.7 percent of agricultural land, respectively.

Pesticides are most frequently applied with ground application equipment. However, use of aerial application equipment is becoming more popular. According to statistics from the ND Aeronautics Commission, approximately 800,000 acres of cropland receive an aerial pesticide application on average each year.

The specific type of pesticide used in an area depends on a variety of factors, including the crop grown, identity of the pest, level of infestation, economic considerations, and other factors that are considered as part of integrated pest management. In addition, as described in the above section, agriculture in North Dakota is generally divided into three main regions across the state. Therefore, the specific pesticides used in each area are closely linked to the types of crops grown in that area. For example, predominant pesticides used in the Red River Valley are those used on crops generally grown there, such as sugar beets, corn and soybeans. In contrast, pesticides used in the central coteau are generally those used most widely on cereal grains, sunflower and canola.

Federal Laws and Regulations

The North Dakota Plan for Threatened and Endangered Species must fit within federal regulations. For this reason, federal regulations pertinent to this plan are discussed below.

FIFRA

The EPA has the authority to regulate the use and registration of pesticides through the Federal Insecticide Fungicide and Rodenticide Act (FIFRA). FIFRA requires that all pesticides be registered with the EPA prior to their distribution and sale. FIFRA also prohibits the use of any registered pesticide in a manner that is inconsistent with the labeling. To register a pesticide, the EPA must ensure that the pesticide does not pose an "unreasonable risk to man or the environment taking into account the economic, social and environmental costs and benefits of the use of any pesticide." This weighing of risks is known as the FIFRA risk/benefit standard.

ESA

The EPA must comply with the Endangered Species Act (ESA) when registering or renewing pesticides. The ESA's purpose is to protect and promote the recovery of animal and plant species that are threatened or in danger of becoming extinct and to ensure that the critical habitat they depend on is not destroyed or adversely modified. Section 7 of the ESA mandates all federal agencies to ensure that all actions authorized, funded or carried out by those agencies are not likely to jeopardize the continued existence of a federally listed threatened or endangered species or their habitat. Through section 7, the EPA must ensure that their actions, including registration of pesticides, will not jeopardize listed species.

ESA implementation under FIFRA

To comply with FIFRA, the EPA must weigh the risks and benefits of a pesticide. However, to comply with the ESA, the EPA must ensure that its actions do not jeopardize listed species. To comply with both mandates, the EPA has developed its Endangered Species Protection Program (ESPP).

The main component of the EPA's ESPP is the use of geographic-specific pesticide use restrictions to better protect listed species from certain pesticide uses. A cornerstone of the program is the use of Endangered Species Protection Bulletins that will be published for specific parishes or counties where there is appreciable risk of pesticides to listed

species. Partnered with appropriate pesticide label language, the Bulletins are regarded as pesticide labeling, and thereby enforceable use restrictions. Pesticide users can access the Bulletins online or by calling a toll-free telephone number. Because Bulletins are distributed online, it is relatively quick and easy for the EPA to change the restrictions.

State Pesticide Authority

The North Dakota Department of Agriculture is the lead pesticide regulatory agency in the state. Under the authority provided by North Dakota Century Code (N.D.C.C.) in Chapter 4.1-34, no person may sell, offer for sale, distribute or transport any pesticide that has not been registered with the North Dakota Agriculture Commissioner. N.D.C.C. 19- 18 allows the Commissioner to review pesticide labeling to ensure that it adequately mitigates risk to human health and the environment. Under N.D.C.C. 4.1-34, the Commissioner can require that a registrant report the amount of each registered pesticide sold, offered for sale, or distributed in the state.

The North Dakota Agriculture Commissioner is also responsible for enforcing N.D.C.C. 4.1-33. Together with the accompanying administrative rules found in Title 60 of the North Dakota Administrative Code, N.D.C.C. 4.1-33 regulates pesticide use, storage, certification, and record-keeping.

Therefore, through the authority granted to the Agriculture Commissioner under both N.D.C.C. 4.1-33 and 4.1-34, the NDDA has authority to regulate pesticides to ensure that only registered pesticides are sold, offered for sale, distributed, or used in the state. The NDDA has regulatory authority to ensure that pesticides are used according to product labeling, and that users and dealers comply with certification and record-keeping requirements.

State Roles

The EPA recognizes that states are an integral part of the success of its Endangered Species Protection Plan (ESPP). Local, state and tribal situations may shape the effectiveness of different approaches to listed species protection. Therefore, the EPA has given states and tribes the option to develop a state-initiated plan. States and tribes may participate in the process at different levels of involvement. A state could choose to do nothing except their obligations as outlined in the Field Implementation Federal Register Notice (FRN), or they could develop a standalone plan that would operate independently of the EPA's registration process. In between these two options, states could supply the EPA with relevant data and recommendations to aid the EPA in better assessing the risk of pesticide uses to listed species and develop effective risk mitigation measures. The state plans would initiate alternative strategies to protect listed species from pesticides for their state or tribe. The EPA could adopt the state plan as EPA policy in that jurisdiction.

If a state or tribe submits a state-initiated plan to the EPA, the EPA will review the plan to see if the services will need to be consulted before the EPA can approve the plan. After a thorough review, the EPA will approve or disapprove the plan and notify the

state or tribe of its actions.

How the EPA conducts a risk assessment

To register a pesticide, the EPA conducts a thorough review of the risk of that pesticide harming man or the environment. This review is done through one or several risk assessment models.

Risk assessment models allow scientists to predict the environmental fate of a pesticide in the environment without conducting extensive field studies. Data entered into the models typically includes the pesticide use rate per acre, number of applications per year, interval between applications and application methods. If data are not available, the EPA is conservative and assumes the maximum value for the parameter to err on the side of the listed species.

NORTH DAKOTA ENDANGERED SPECIES PROTECTION PLAN FOR PESTICIDES

The North Dakota Department of Agriculture believes the best way to serve the interests of the citizens of North Dakota is to develop a state-initiated plan for endangered species protection. A state-initiated plan will help ensure that the EPA has access to accurate and relevant pesticide use data, cropping information, and accurate information on the occurrence and distribution of listed species in the state. The NDDA also believes that a state-initiated plan will improve stakeholder buy-in and compliance by helping to ensure that any use restrictions are protective and reasonable. Input from the state could also include state-specific risk assessments based on local soil types, weather conditions, or pesticide use patterns. Access to accurate and timely data will help to ensure that we develop a program that will be more protective of species than if there was limited state involvement.

The North Dakota Endangered Species Protection Plan for Pesticides proposes a process for the NDDA to provide specific state-level data and recommendations to the EPA to consider in risk assessment processes. Data on local pesticide use would make the EPA's risk assessments more accurate. This greater accuracy would afford species greater protection while not putting an unnecessary burden on pesticide users.

Components of North Dakota Endangered Species Protection Plan for Pesticides

The EPA will be assessing the potential for pesticides to negatively impact listed species. There will be opportunities for state input throughout this process. First, the EPA will seek public comment on published ecological risk assessments during the pesticide registration, registration review, and re-registration processes. Second, the EPA will develop Bulletins and propose use restrictions to better mitigate the risk of pesticides to listed species.

NDDA realizes that the quality of the EPA's decisions on implementing measures to mitigate the risk of pesticides to listed species will be directly related to the quality of data that the EPA has available. Therefore, NDDA requests the opportunity to supply the EPA with data and recommendations on any pesticide uses or use restrictions that may impact North Dakota.

NDDA would provide the EPA with specific data on pesticide use in North Dakota to be utilized in EPA's evaluations of pesticide risk to endangered species. In the next phase, NDDA would participate in the process of Bulletin development and mitigate pesticide restriction if necessary.

Phases of the plan

The North Dakota Plan for Endangered Species Protection has three phases

1. Submission of state data to the EPA
2. Development of risk mitigation measures
3. Bulletin development and outreach

Phase 1

Under Phase 1 of the plan, NDDA would supply the EPA with relevant data that the EPA can utilize as the Age assesses the risk of certain pesticide uses to listed species. These data include:

A. *Pesticide use data*. In conjunction with the ND Agriculture Statistics Service (NDASS), NDSU Extension conducts a pesticide use survey of North Dakota agricultural pesticide users as budgets allow. This data is critical as we assess what pesticides are used in the state, where they are used, and in what manner. The surveys are currently published with state-wide pesticide use estimates, but it is likely that NDDA can refine existing statewide estimates to a county-by-county basis. The NDDA commits to supply the EPA with the most accurate estimates available on pesticide use in North Dakota. With access to refined and accurate pesticide use information, the EPA can better assess exposure of listed species to a given pesticide and whether additional use restrictions are needed to mitigate risk.

B. *Distribution & biology information on listed species*. If we are to assess the risk of pesticides to listed species in the most accurate manner, we need to know where each species is found in the state. We also need to know as much as possible about the biology of each species, including habitat, feeding habits, migratory patterns, and distribution. This information is critical as the EPA conducts risk assessments. The NDDA commits to supply the EPA with as much information as is available on the biology and distribution of the listed species in North Dakota.

C. *Information on the overlap between pesticide use and listed species*. Estimating exposure of listed species to given pesticides is a critical component of any risk assessment. Based on existing knowledge of listed species distribution, cropping information, and pesticide use, the NDDA can estimate whether a given pesticide use is likely to occur in the same locations and times where listed species are found. Under Phase 1, the NDDA will provide the EPA with information on the potential overlap of pesticide uses and endangered species habitat.

D. *Cropping information*. North Dakota has very diverse agriculture. However, based on climatic and soil factors, certain crops are localized in different parts of the state.

E. The ND Agriculture Statistics Service maintains databases with county-by-county estimates of where certain crops are grown. This is important since most pesticides are only used on certain crops. Information on which crops are grown in different parts of the state and in different counties will aid the EPA as it conducts risk assessments. Yearly maps can be found at: https://nassgeodata.gmu.edu/CropScape/

F. *Environmental monitoring data*. The NDDA is working with partner state and federal agencies to conduct monitoring of surface water in North Dakota for pesticides. As we assess the potential for a given pesticide or pesticide class to move into surface water and other media, it is advantageous to know whether those pesticides or similar chemistries have been detected in the environment at significant concentrations. This information will be critical as we identify those pesticides that have a potential to move off-site and negatively impact listed species. The NDDA commits to supply the EPA with the best pesticide environmental monitoring data that is available.

G. *Soil type information*. There are significant differences in the soil types across North Dakota. Soil type can have a dramatic effect on a pesticide's environmental fate, affecting such things as sorption, degradation, and leaching. The NDDA has access to soil type information for the state and commits to make this information available to the EPA.

In 2007 the ND legislature provided state-funded resources to the NDDA to create an Endangered Species Protection Program. These funds were used to create two new positions in the NDDA, both of which have been filled. One of the positions is a Geographic Information System (GIS) Specialist position, and this person has been compiling much of the data described here in a GIS database. These data can be supplied to the EPA in a compiled and layered GIS database. However, the NDDA will supply the EPA with relevant data in whatever format and manner that the EPA requests it.

Phase 2

In addition to supplying the data described under Phase 1, the NDDA can supply the EPA with recommendations on potential pesticide use limitations to better protect endangered and threatened species. Specifically, NDDA will contribute recommendations on the technological, social and economic feasibility of implementing any proposed pesticide use limitations. Such input is essential since states understand the socioeconomic and political intricacies that exist within the state, as well as how to best change behaviors among its citizens.

The NDDA has many years of experience in regulating pesticide users and dealers in North Dakota. We have gained considerable insight not only on the culture and social environment within the state, but also in working with pesticide users to gain compliance with pesticide laws and regulations. Therefore, the NDDA would also offer its recommendations on developing pesticide use restrictions that are enforceable and practical. Since the NDDA is the lead pesticide regulatory agency in the state and will be the entity charged with enforcing any pesticide use restrictions developed through the ESPP, we feel that it is essential we have a role in developing the use restriction language.

In addition, the NDDA has made a concerted effort to build a relationship of trust and mutual respect with the Bismarck field office of the U.S. Fish and Wildlife Service (USFWS). The USFWS is also given an opportunity to offer input on FIFRA Section 18 exemption requests as well as FIFRA Section 24(c) registrations. We value this relationship with the USFWS and anticipate interacting with local USFWS staff as part of developing recommendations to the EPA. This close working relationship between the NDDA and local USFWS staff will be invaluable as we strategize on how to best protect listed species in North Dakota from pesticides.

The NDDA hopes that there will be ample opportunities for state input as risk mitigation measures are developed, both on a formal and informal basis. The NDDA proposes to offer recommendations on draft pesticide label language as well as proposed use restrictions to be included in Bulletins.

Phase 3

A cornerstone of the EPA's ESPP will be the use of Bulletins that will add geographic-specific use restrictions beyond those on the product label whenever greater protection is needed. The NDDA fully supports the use of Bulletins as a means of providing greater protection of threatened and endangered species when such protection is needed. Such Bulletins will also allow pesticide regulators to accurately define those areas where use restrictions are required.

If Bulletins are necessary to better mitigate risk, the NDDA offers its assistance in the development and review of those documents. Specifically, the NDDA will review the Bulletins for accuracy and to determine whether there are better means to identify those areas where the use restrictions are in effect. The NDDA could also provide digitized maps to the EPA and express landmarks in terms commonly used in the state. The NDDA also offers its expertise and experience to assist the EPA in developing the

language used in the Bulletins.

Once Bulletins are published, the NDDA will provide outreach and communication to pesticide dealers and applicators through a variety of means. The NDDA already provides a link to EPA's ESPP website on the NDDA's website (http://www.agdepartment.com/). The NDDA can conduct targeted outreach and meetings in specific areas of the state or among certain pesticide user groups to better communicate the need to comply with Bulletins, how to access them, and the rationale used to develop the risk mitigation measures. The NDDA staff can discuss Bulletins at pesticide certification and training sessions, as well as during other education opportunities.

SUMMARY

The North Dakota Department of Agriculture values the partnership that it has with the EPA as we regulate pesticides to mitigate risk to human health and the environment. We also recognize that pesticides are important management tools and an essential component of integrated pest management. We are confident and hopeful that state participation in the EPA's ESPP will be extremely valuable. The NDDA strives to provide the EPA with the most timely and accurate data available, thereby allowing the EPA to make good decisions that are based on sound science. Access to accurate, local data on pesticide use, listed species distribution, cropping information, and soil types will allow the EPA to better estimate exposure and conduct risk assessments. Furthermore, offering the NDDA the opportunity to offer recommendations on potential risk mitigation strategies will allow us to develop pesticide use restrictions that are not only protective of listed species, but also reasonable. If the restrictions don't seem reasonable to the pesticide community, gaining buy-in and compliance may be very difficult.

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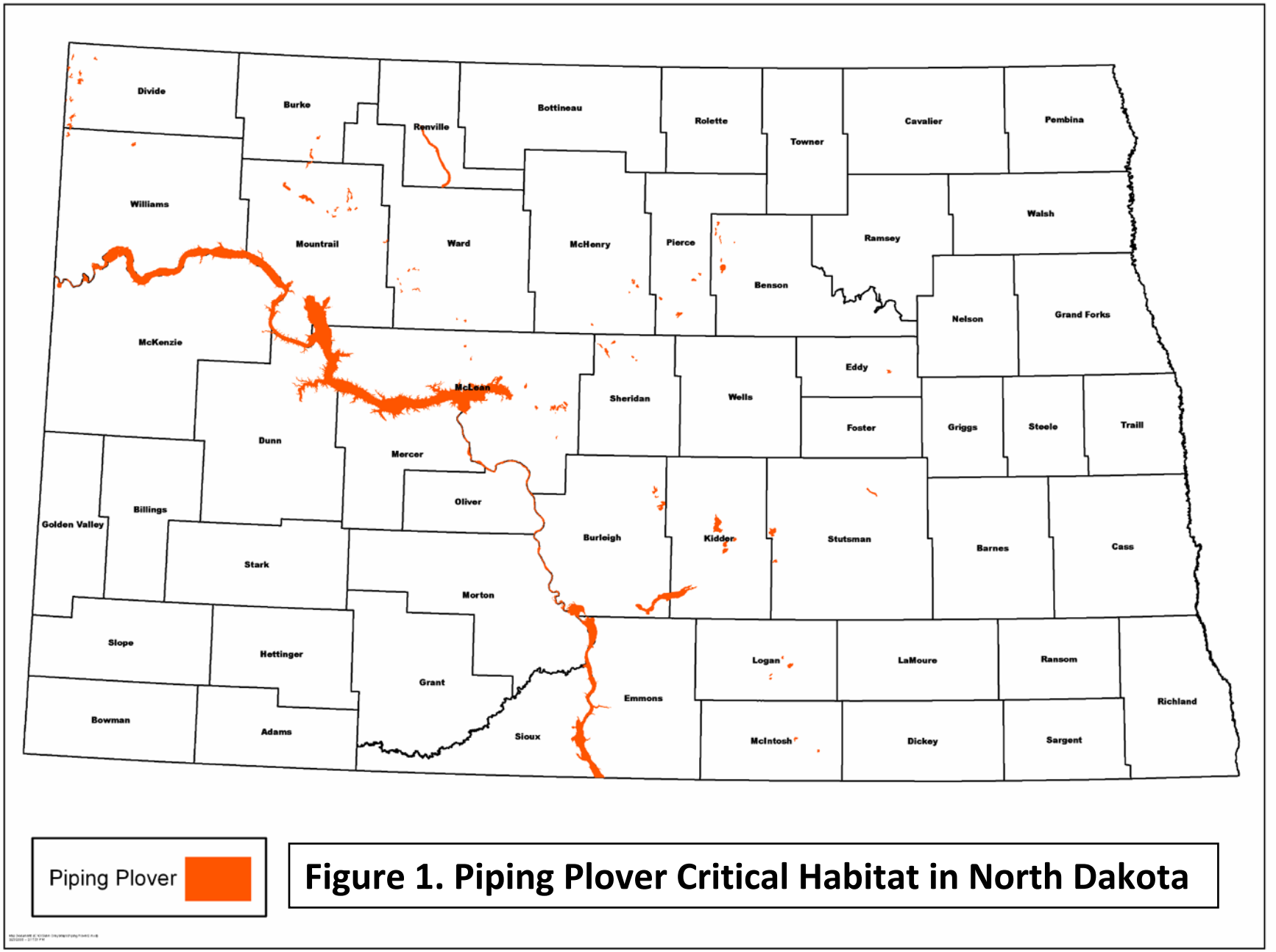


Figure 1. Piping Plover Critical Habitat in North Dakota

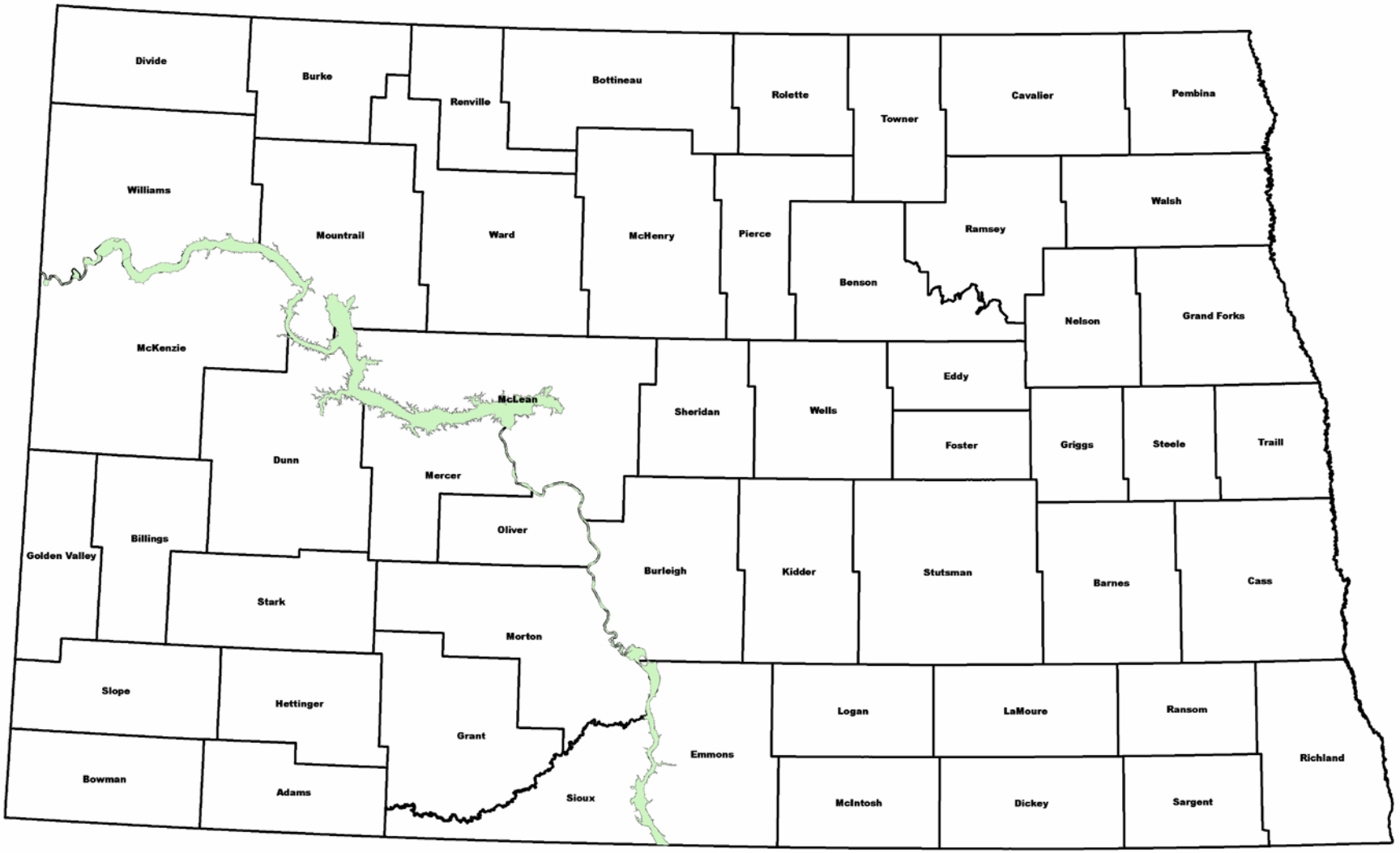


Figure 2. Least Tern Habitat in North Dakota

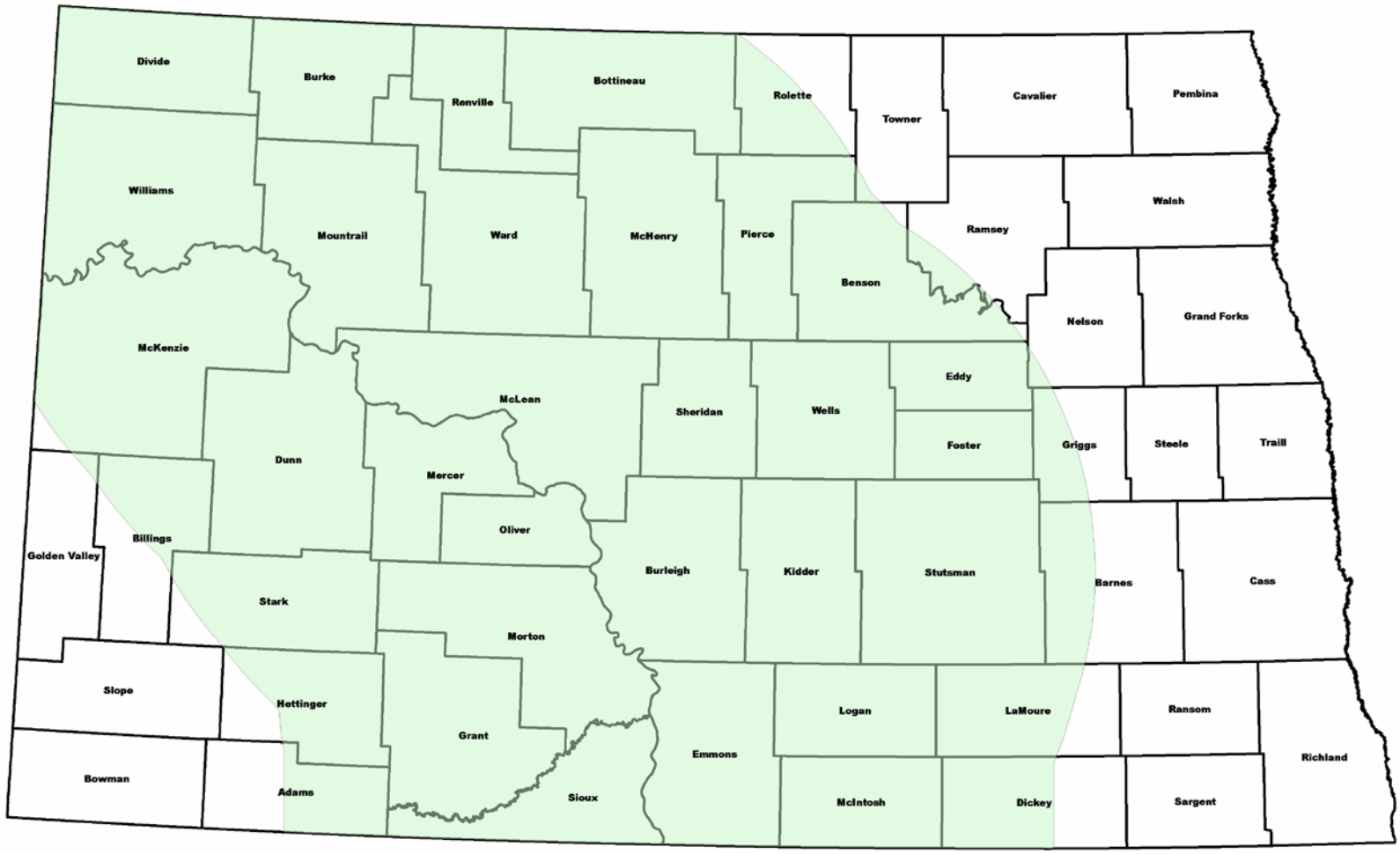


Figure 3. Whooping Crane Migration Corridor in North Dakota

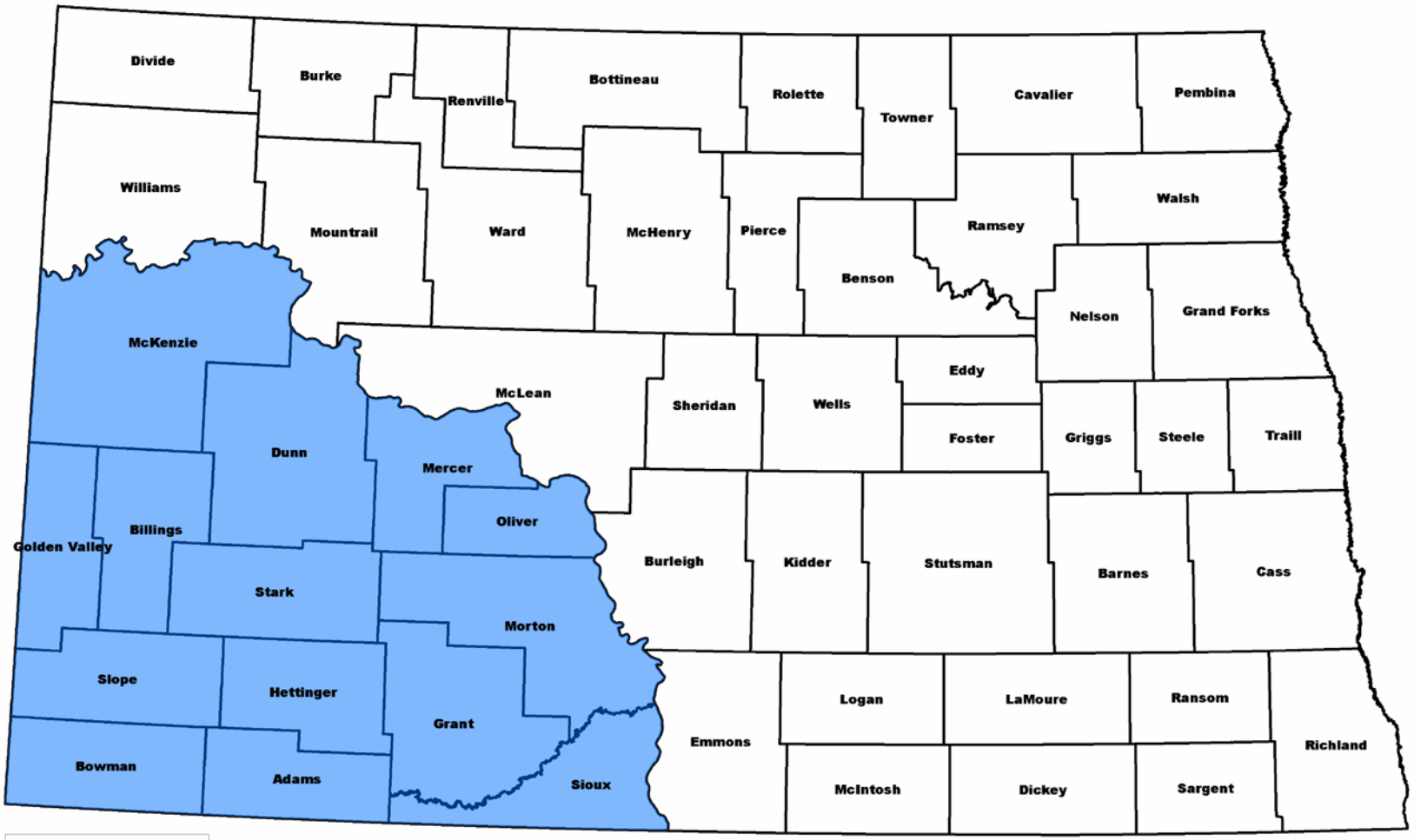


Figure 4. Potential Black Footed Ferret Habitat in North Dakota

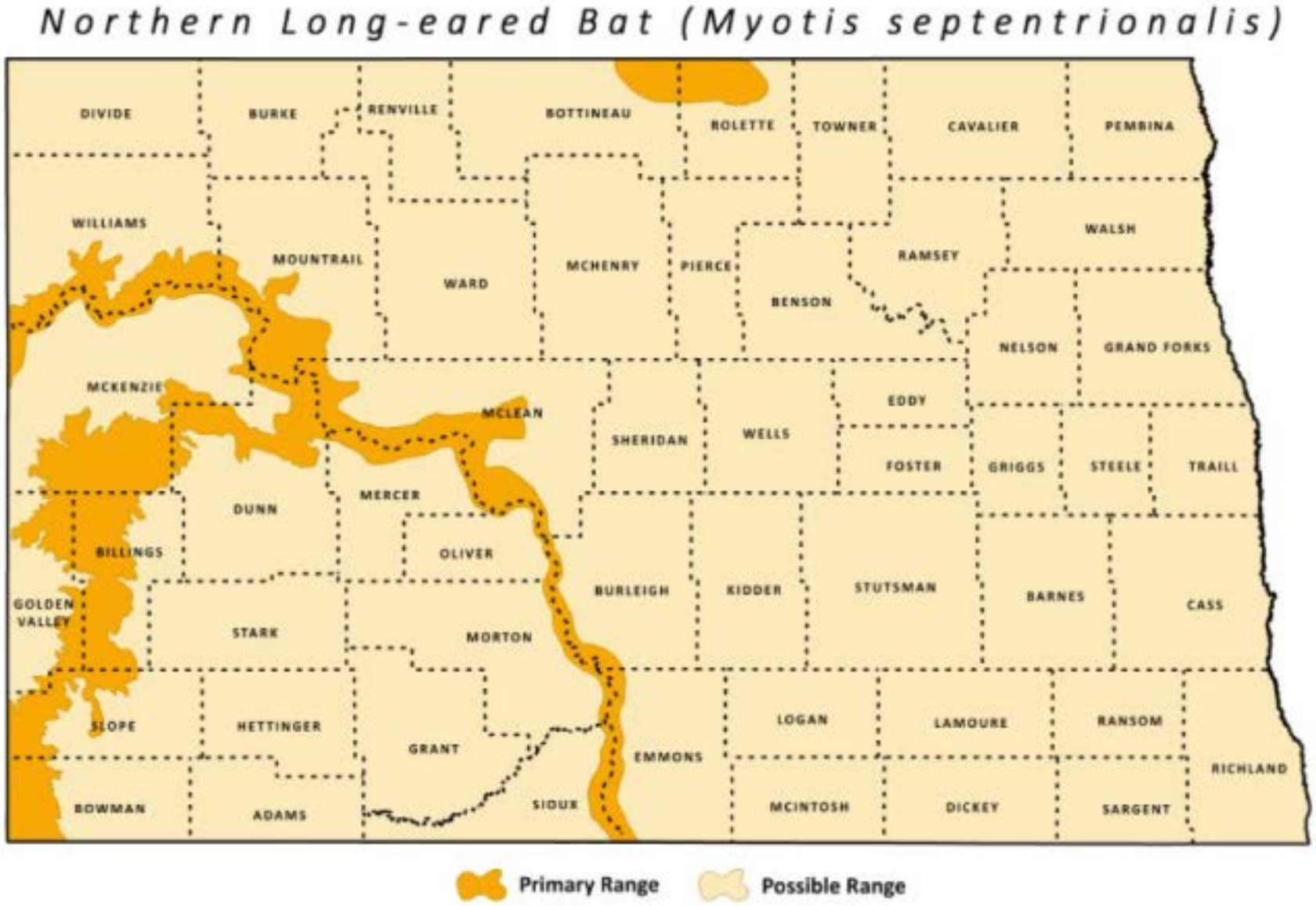


Figure 5. Potential Northern Long-Eared Bat Habitat in North Dakota

Map Source: North Dakota Game and Fish Department

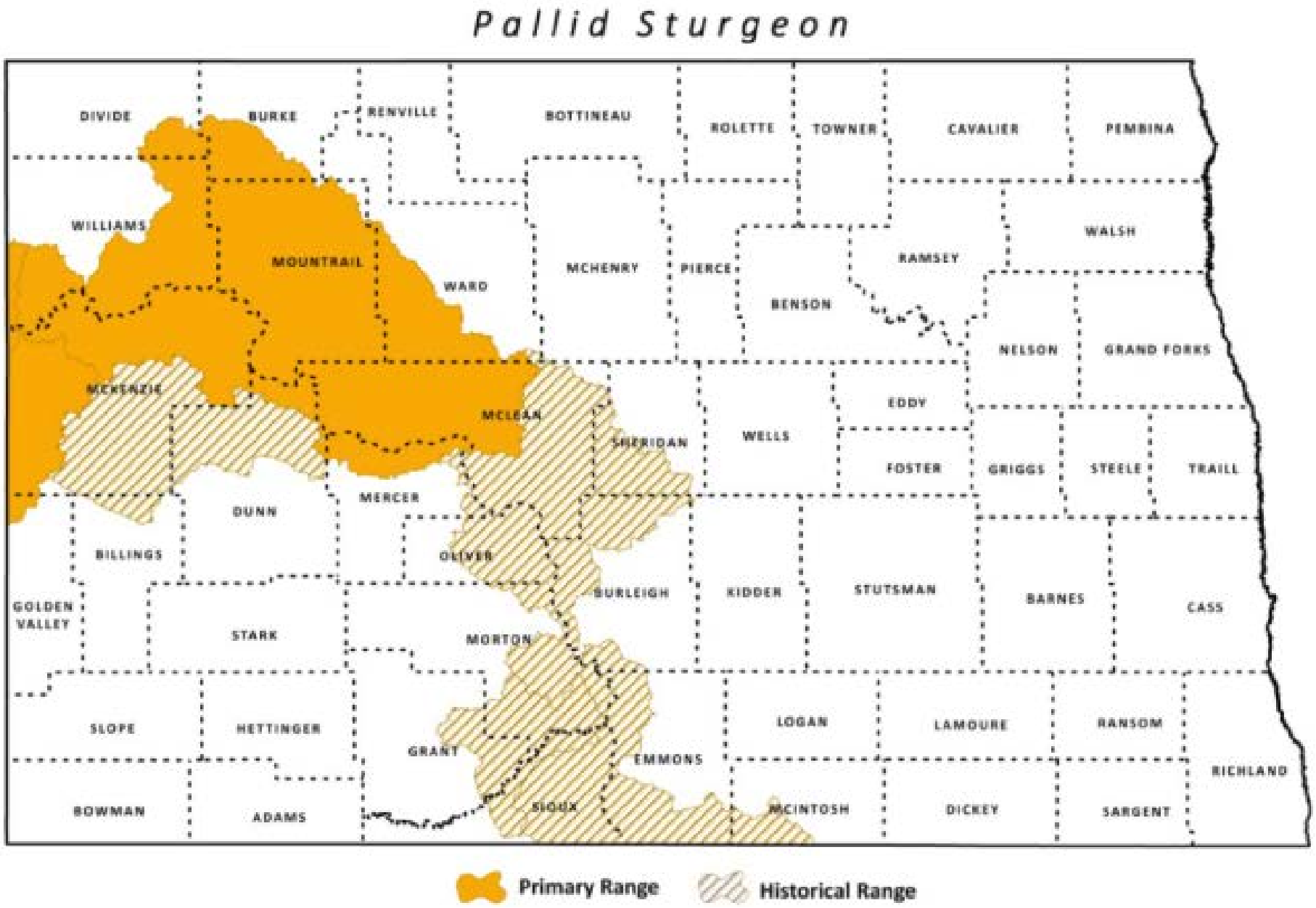


Figure 6. Pallid Sturgeon Habitat in North Dakota

Map Source: North Dakota Game and Fish Department

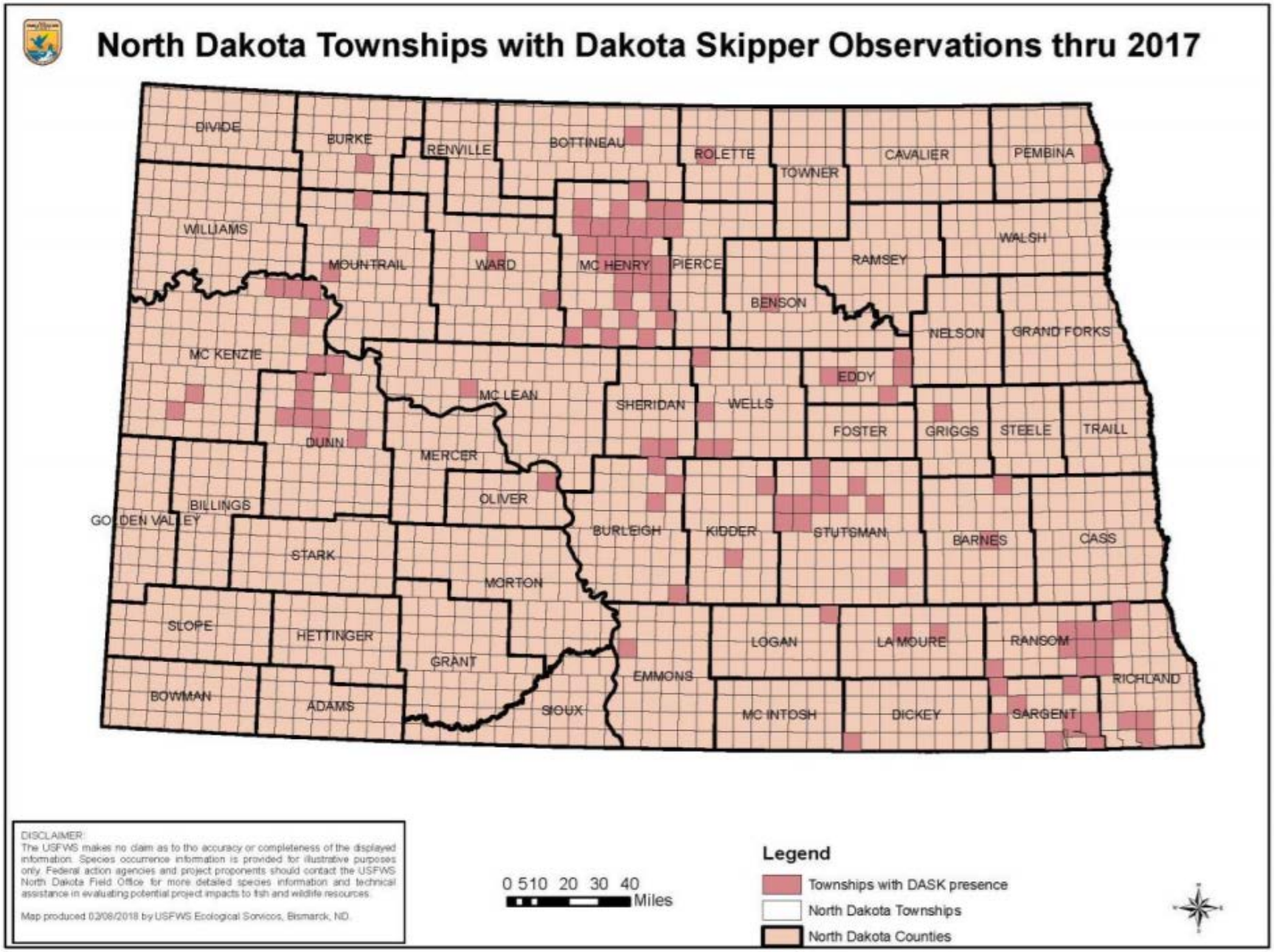
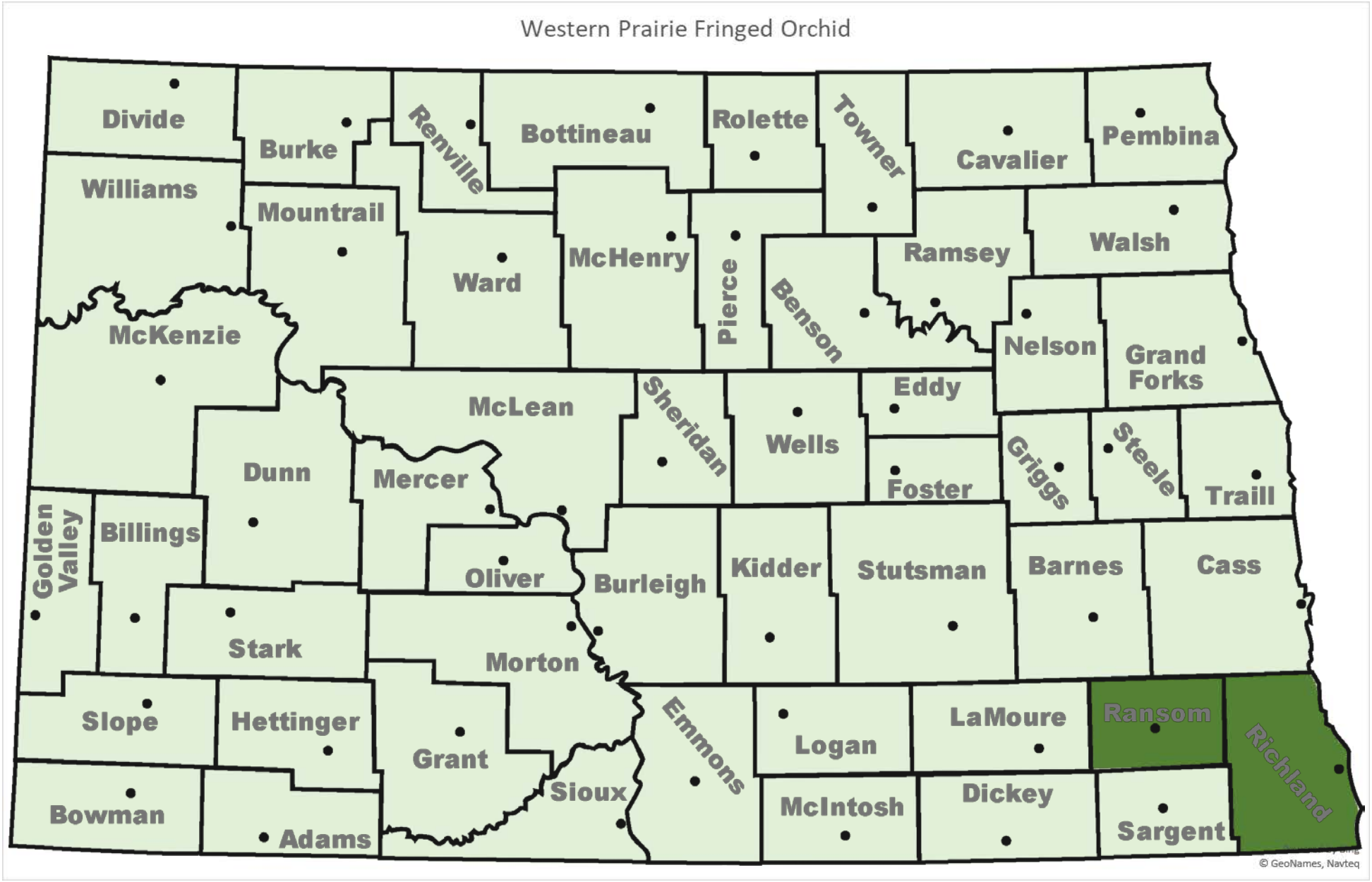


Figure 7. Dakota Skipper Habitat in North Dakota

Map Source: United States Fish and Wildlife Service



Counties Where Western Prairie Fringed Orchids are Found

Figure 8. Western Prairie Fringed Orchid Habitat in North Dakota

APPENDIX: Quality Control of Data

A. Pesticide Use Data

Pesticide use data is gathered as budgets allow through collaboration among North Dakota State University (NDSU), the North Dakota Department of Agriculture (NDDA), and the North Dakota Field Office of the National Agriculture Statistics Service (NASS). Use data was last collected in 2012.

In 2012 authors of the study included R.K. Zollinger, NDSU Extension; S. Markell, NDSU Extension; J. Knodel, NDSU Extension; J. Gray, NDDA; D. Jantzi, USDA, NASS, ND FO; K. Hagemeister USDA, NASS, ND FO; P. Kilpatrick, USDA, NASS.

The specific objectives of the survey were to:

- Identify acreage of crops treated with each pesticide group and identify specific pesticides used.
- Determine pesticide usage by state districts.
- Determine the percentage of pesticides applied by farm operator or custom applicator by air or ground equipment.
- Determine extent of use of several non-chemical pest control methods.

Methodology
NDSU, NASS, and NDDA designed the survey. As in previous surveys, pesticide use data for wheat, barley, oat, corn, soybean, dry edible beans, dry pea, lentil, sunflower, flax, canola, sugarbeet, alfalfa hay, other hay, CRP, fallow and pasture were requested for the 2012 crop year. NASS was responsible for implementing the survey. The survey was conducted as a phone survey. NASS selected a sample population of 7,000 farm operators to represent each crop at the district level. The target for useable surveys was 3,500 responses, stratified across NASS's reporting districts. After selection of the sample population, a pre-survey letter was mailed to alert selected growers of the survey effort and content. Interviews were conducted from late January through March 2013.

The Questionnaire
The questionnaire was designed to collect pesticide data for major and minor crops, summer fallow, CRP and pasture in North Dakota for the 2012 crop year. The questionnaire was similar to those used previously. Information on individual crop total acres seeded, acres seeded with any treated seed and acres seeded with farm-treated seed was obtained. Acres treated by crop were determined for the general pesticide categories of herbicides, insecticides, fungicides and desiccants.

Pesticide usage data included the active ingredient used, acres treated, number of applications, type of applicator (self-applied or applied via custom application), and method of application (ground or aerial) for each major crop or land use identified by the respondent.

The Sample
A sample of 7,000 farm operators was selected at random from the USDA National Agricultural Statistics Service (NASS) list of farm operators.

Data Collection and Editing
Telephone interviews were conducted from February to mid-April 2013. A total of 2,511 usable surveys were obtained.

Of the producers surveyed for 2012, 31 percent grew wheat, 21 percent soybean, 8 percent barley, 20 percent corn, 6 percent oat, 5 percent sunflower, 3 percent flax, 8 percent canola, 2 percent field pea, 3 percent dry bean, 1 percent sugarbeet, 1 percent lentil, 25 percent alfalfa, 21 percent other hay, 39 percent CRP, 35 percent pasture, and 3 percent fallow.

The data review process addressed completeness and reasonableness of data within each section of the questionnaire and across sections. For example, the acreage treated with herbicides reported in the first section of the questionnaire was compared to the total herbicide-treated acreage reported in Section III for each crop.

B. Distribution and monitoring on listed species

Gray Wolf
Gray wolves are known to inhabit areas in bordering states and Canadian provinces and occasionally move through North Dakota. The presence of wolves in most of North Dakota will likely remain sporadic and consist of occasional dispersing animals from Minnesota and Manitoba.

Whooping Cranes
Whooping crane tracking is a coordinated effort between the USFWS Bismarck Field Office and the North Dakota Game and Fish Department. Each fall and spring during migration, a press release is issued calling on the public to report sightings. Whenever possible, reports by the public are verified by biologists. If it is not possible to verify the report, the EPA conducts an interview to determine the accuracy of the report.

Black-footed Ferret
Black-footed ferrets were historically found in North Dakota associated with prairie dog towns. From 1987 to 1991 ferrets may have been extirpated in the wild. Since 1991, ferrets have been reintroduced into Montana, South Dakota, Colorado, and Arizona. The number of wild born kits is increasing annually. Unconfirmed sightings in North Dakota are occasionally reported and typically come from the southwest part of the state.

Piping Plovers and Interior Least Terns-Missouri River Populations

The Missouri River populations of plovers and terns are mapped by the US Army Corps of Engineers through a data management system. The Missouri River Recovery Program Least Tern and Piping Plover Data Management System (TP DMS) was developed to provide a single, centralized system for entry, storage, and dissemination of piping plover and least tern survey data from the Missouri River Basin while maintaining data quality standards for survey data and providing real time information for decision making processes.

Database structure enables avoidance of redundant record keeping and provides for easy and timely backups of survey data. Built in validation routines and manual approval provide for rigorous data standards and ensure quality data are available for reports and data presentation which can be used by our partners and decision makers. More information about the TP DMS database can be found at: https://rsgisias.crrel.usace.army.mil/intro/dms.dmsintro.main

Piping Plover-Coteau Population

The U.S Alkali Lakes Core Area (Core Area) is composed of five wetland management districts (NE Montana, Crosby, Lostwood, Audubon, Long Lake), four national wildlife refuges (Medicine Lake, Lostwood, Audubon, Long Lake) and The Nature Conservancy's John. E. Williams Preserve. Many plover nesting basins occur on private lands within the wetland management districts and over 150 landowners granted permission to survey for plovers in 2017. Maintaining a positive working relationship with the landowners is critical for plover recovery and continued opportunities for conservation easements, habitat enhancement projects (i.e. removing artificial habitat such as planted trees, junk piles and rock piles) and population monitoring and research.

In 2014, the U.S. Army Corp of Engineers funded a multi-year metapopulation study of piping plovers in the U.S. Northern Great Plains. USGS Northern Prairie Wildlife Research Center (NPWRC) leads the metapopulation study, which involves banding adults and chicks on the Missouri River, its reservoirs and the Alkali Lakes, and resighting banded individuals. The objectives of the study are to assess the contribution of each breeding area to the northern Missouri River system, estimate the probability of movement of plovers among the NGP subunits, evaluate how the interplay between water levels, degree of exposed shoreline, and mid-season nest loss drive demographics of the subunits (USGS 2015). The study plan calls for a five-year effort to obtain the necessary data. This is the fourth year that the Alkali Lakes have participated in the study. In 2017, three FWS technicians, one Student Conservation Association volunteer, two FWS Interns, and one TNC technician worked to monitor piping plovers in the Core Area. Additionally, four USGS technicians were assigned to the Alkali Lakes, two at Crosby to cover that district and NE Montana WMD, plus one each at Audubon and Long Lake.

Pallid Sturgeon
A great amount of uncertainty exists about what is needed to prevent the pallids' extinction and how to effectively improve habitat conditions with the multitude of uses for the limited resource. Increased and sometimes conflicting uses of water in big river systems is requiring that communities, states and the federal government collaboratively develop management strategies that balance the multiple uses and provide adequate habitats for the aquatic communities. A monitoring program was designed to assist in that decision process by providing trend information on the pallid sturgeon and related aquatic communities.

The strategy as outlined in the Missouri River Standard Operating Procedures for Sampling and Data Collection (SOP's) (Welker and Drobish 2017) details the methodology and information to be collected under this program. This monitoring effort is a collaborative effort of state and federal biologists all working toward the same goals. It is considered a long-term monitoring effort due to the need to develop trend information that describes population conditions and a relationship with the environmental conditions that exist. A great deal of variation exists within the aquatic populations, habitats and conditions throughout the Missouri River.

Western Prairie Fringed Orchid
North Dakota Parks and Recreation Department surveys western prairie fringed orchids in North Dakota. This section will be updated in the future.

Dakota Skipper, Poweshiek Skipperling and Rusty Patched Bumble Bee
Historical information is limited on these species and small, localized studies have been done in the past to learn more about these species. Two projects began field work in 2017 to gather robust information on pollinator species in North Dakota. The USFWS is conducting regional surveys to measure abundance and distribution of several native bee and butterfly species. NDSU is conducting a multi-year, statewide study to identify, estimate abundance of and determine insect-plant species relationships of native bee and butterfly species in North Dakota. There are various other, small scale projects focused on Dakota skipper. As more information is gathered, this section will be updated.

Northern Long-Eared Bat
Similar to the bee and butterfly species, little is known about bat species in North Dakota. NDSU is conducting a research project studying roosting habitat and abundance of bat species in North Dakota that will conclude in 2019. As more information is gathered this section will be updated.

C. Information on the overlap between pesticide use and listed species

The NDDA will provide maps using and combining the same quality data as the above sections.

D. Cropping information

Cropping information is from the National Agriculture Statistics Service (NASS), a division of the US Department of Agriculture. Information can be viewed or downloaded at: https://www.nass.usda.gov/Research_and_Science/Cropland/metadata/meta.php.

E. Environmental monitoring data

Surface water monitoring data from the NDDA will have an EPA approved Quality Assurance Project Plan (QAPP).

F. Soil type information

Data on soil types in North Dakota come from the Natural Resource Conservation Service's National Cooperative Soil Survey. The Soil Survey Geographic Database (SSURGO) certification process was completed on June 9, 2005. Soil survey data have been archived digitally in every county across the state. The digital SSURGO dataset is being continuously maintained across the state with improved efficiency by incorporating use of Geographic Information Systems (GIS) into analysis.

Appendix Reference

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