Appendix 2.1 Provisional vegetation and land cover classification scheme developed early in the North Dakota Gap Analysis project showing the relationship of land cover categories to alliances in the North Dakota Subset of the National Vegetation Classification System.

Physiognomic Class
    Physiognomic Subclass
        Physiognomic Subgroup
            ND GAP Land cover category
                TNC/FGDC Alliances

FOREST - > 60 % tree canopy with crowns interlocking
    Coniferous Forest
        Planted/Cultivated
            Coniferous Shelterbelts /Plantations
    Deciduous Forest
        Natural/Semi-Natural Upland
            Green Ash -American Elm Forest
                Fraxinus pennsylvanica - (*Ulmus americana*) Forest Alliance
            Bur Oak Forest
                Quercus macrocarpa Forest Alliance
            Aspen Forest
                Populus tremuloides Forest Alliance
            Paper Birch Forest
                Be*tula papyrifera* Forest Alliance
        Natural/Semi-Natural Lowland
            Green Ash-American Elm-Basswood Forest
                Fraxinus pennsylvanica - *Ulmus americana* - *Celtis* (*occidentalis*, *laevigata*)
                Temporarily Flooded Forest Alliance
            Cottonwood Forest
                Populus deltoides Temporarily Flooded Forest Alliance
            Aspen Lowland Forest
                Populus tremuloides Temporarily Flooded Forest Alliance

Planted/Cultivated

Deciduous Shelterbelts/Plantations

Mixed Conifer and Deciduous

Planted/Cultivated

Mixed Conifer and Deciduous Shelterbelts/Plantations

WOODLAND - Open stands of trees comprise 25 - 60 % cover

Coniferous Woodland

Natural/Semi-Natural

Rocky Mountain Juniper Woodland

Juniperus scopulorum Woodland Alliance

Limber Pine Woodland

Pinus flexilis Woodland Alliance

Ponderosa Pine Woodland

Pinus ponderosa Woodland Alliance

Deciduous Woodland

Natural/Semi-Natural Upland

Green Ash - American Elm Woodland

Fraxinus pennsylvanica - (*Ulmus americana*) Woodland Alliance

Bur Oak Woodland

Quercus macrocarpa Woodland Alliance

Aspen Woodland

Populus tremuloides Woodland Alliance

Paper Birch Woodland

Betula papyrifera Woodland Alliance

Natural/Semi-Natural Lowland

Cottonwood Woodland

Populus deltoides Temporarily Flooded Woodland Alliance

SHRUBLAND Shrubs > 25 % cover with < 25 % tree cover

Evergreen Shrubland

Natural/Semi-Natural

Silver Sagebrush Shrubland
Artemisia cana Shrubland Alliance
Big Sagebrush Shrubland
Artemisia tridentata ssp. *wyomingensis* Shrubland Alliance
Creeping Juniper Dwarf Shrubland
Juniperus horizontalis Dwarf-shrubland Alliance
Deciduous Shrubland
Natural/Semi-Natural
Upland Deciduous Shrubland
Amelanchier alnifolia Shrubland Alliance
Elaeagnus commutata Shrubland Alliance
Prunus virginiana Shrubland Alliance
Symphoricarpos occidentalis Shrubland Alliance
Shepherdia argentea Shrubland Alliance

Lowland Deciduous Shrubland
Salix exigua Temporarily Flooded Shrubland Alliance
Alnus incana Seasonally Flooded Shrubland Alliance
Cornus sericea - *Salix* spp. Seasonally Flooded Shrubland Alliance
Betula pumila - (*Salix* spp.) Saturated Shrubland Alliance

GRASSLAND
Tall Grass Prairie
Natural/Semi-Natural
Wet-Mesic Tall Grass Prairie -
Andropogon gerardii - (*Calamagrostis canadensis*, *Panicum virgatum*) Herbaceous Alliance
Mesic Tall Grass Prairie
Andropogon gerardii - (*Sorghastrum nutans*) Herbaceous Alliance

Mixed Grass Prairie
Natural/Semi-Natural
Mesic Mixed Grass Prairie
Pascopyrum smithii - *Stipa commata* Herbaceous Alliance

Pascopyrum smithii - Nasella viridula Herbaceous Alliance
Poa pratensis Herbaceous Alliance

Dry-Mesic Mixed Grass Prairie

Schizachyrium scoparium - Bouteloua species Herbaceous Alliance

Dry Mixed Grass Prairie

Stipa comata - Bouteloua gracilis Herbaceous Alliance

Fescue Prairie

Festuca scabrella Herbaceous Alliance

Inland Saltgrass Prairie

Distichlis spicata - (*Hordeum jubatum*) Temporarily Flooded Herbaceous Alliance
Hordeum jubatum Temporarily Flooded Herbaceous Alliance
Pascopyrum smithii Temporarily Flooded Herbaceous Alliance

Sand Prairie

Andropogon hallii Herbaceous Alliance
Calamovilfa longifolia Herbaceous Alliance

Planted/Cultivated

Exotic Grassland

Conservation Reserve Program
Agropyron cristatum
Bromus inermis

PERENNIAL FORB

Natural/Semi-natural

Exotic Forb

Euphorbia esula Herbaceous Alliance

Planted/Cultivated

Hayland

Alfalfa
Sweet Clover

WETLAND - National Wetlands Inventory data, contiguous wetlands dissolved to most permanent water regime

Temporary wetland

Carex lanuginosa Temporarily Flooded Herbaceous Alliance

Carex spp. - *Plantago eriopoda* Temporarily Flooded Herbaceous Alliance
Spartina pectinata Temporarily Flooded Herbaceous Alliance

Seasonal wetland

Carex (*rostrata*, *utriculata*) Seasonally Flooded Herbaceous Alliance
Carex aquatilis Seasonally Flooded Herbaceous Alliance
Carex atherodes Seasonally Flooded Herbaceous Alliance
Carex stricta Seasonally Flooded Herbaceous Alliance
Scolochloa festucacea Seasonally Flooded Herbaceous Alliance
Typha spp. - (*Scirpus* spp. - *Juncus* spp.) Seasonally Flooded Herbaceous Alliance

Semi-permanent wetland

Phragmites australis Semipermanently Flooded Herbaceous Alliance
Scirpus acutus - (*Scirpus tabernaemontani*) Semipermanently Flooded Herbaceous Alliance
Scirpus maritimus Semipermanently Flooded Herbaceous Alliance
Typha (*angustifolia*, *latifolia*) - (*Scirpus* spp.) Semipermanently Flooded Herbaceous Alliance

Permanent wetland

Potamogeton pectinatus Permanently Flooded Herbaceous Alliance
Potamogeton spp. - *Ceratophyllum* spp. - *Elodea* spp. Permanently Flooded Herbaceous Alliance
Ruppia maritima Permanently Flooded Herbaceous Alliance

Developed - areas where man-made structures cover large proportions of the land

Cropland - areas planted to annual grain or row crops

Sparse Vegetation/Barren Land Vegetation typically <10 %

Sarcobatus vermiculatus Shrubland Alliance
Atriplex confertifolia Shrubland Alliance
Artemisia tridentata Shrubland Alliance

Water

Appendix 2.2 Cell value in the land cover raster, land cover category name, and description of land cover category for 39 land cover categories at the lower level of the land cover classification system for the ND-GAP land cover map.

1 - Cropland. Lands tilled and planted to annual herbaceous small grain and row crops. Common small grain crops include wheat, barley, and oats. Examples of row crops include corn, sunflowers, soybeans, sugar beets, and potatoes. The land cover category includes both non-irrigated and irrigated crops. These lands have a bare soil phase during the growing season that generally occurs in early spring when most crops are planted. The bare soil phase is unique to croplands and is important for accurate discrimination of croplands from other land cover types using remotely sensed imagery.

2 - Planted Herbaceous Perennials. Lands planted to perennial herbaceous grasses, forbs, or grass-legume mixtures. Often the species planted are introduced species such as smooth brome, crested wheatgrass, alfalfa and sweet clover although some plantings are native grass species. Most lands are used to produce forage crops for harvest or for grazing by domestic livestock. This class includes lands enrolled in retired cropland conservation programs that are planted to grass and legume species. In addition to planted fields, smooth brome has invaded and established stands in many native grasslands and some of these are likely mapped as planted grasslands. Leafy spurge invasions in native grassland may also be mapped as this class.

10 - Wet-Mesic Tallgrass Prairie. Low lying lands of depressions and drainage ways with a high water table and high water availability. Characteristic native grasses include *Spartina pectina, Calamagrostis canadensis, Calamagrostis stricta, Carex lanuginosa, Andropogon gerardii and Panicum virgatum. Phalaris arundinacea* is a common non-native species in some stands. This map unit corresponds most closely with the concepts of the *Andropogon gerardii* - (*Calamagrostis canadensis, Panicum virgatum*) herbaceous alliance of the NVCS and the wet meadow and subirrigated range sites of the NRCS. Some stands of this category are mapped as palustrine temporary wetlands by the U.S FWS National Wetlands Inventory.

11 - Mesic Tallgrass Prairie. Nearly level lowlands, depressions and lower slopes in moderately rolling uplands than receive runoff from the adjacent landscape. Soils are deep, moderately well drained with variable texture and high available water capacity. Dominant grasses are *Andropogon gerardii, Sorghastrum natans, Panicum virgatum* and *Schizachyrium scoparium*. This map unit corresponds most closely with the concepts of the *Andropogon gerardii* - *Hesperostipa spartea* - Sporobolus heterolepis herbaceous vegetation association of the Andropogon gerardii - (*Sorghastrum nutans*) herbaceous alliance of the NVCS and the subirrigated range sites of the NRCS.

12 - Mesic Tall and Mixed Prairie. The species composition of this map unit is heavily influenced by grazing history and moisture availability. On the most mesic sites with light grazing, *Andropogon geradii* and other tall grasses can be abundant. As water availability decreases or herbivory increases, mid grasses such *as Pascopyrum smithii, Nassela viridula*, and *Bromus inermis* increase in importance. Under heavy continuous grazing *Poa pratensis* and *Bouteloua gracilis* can dominate the sites. Landscape positions include swales, depressions, and footslopes with increased water availability from runon from adjacent lands. This map unit corresponds to the concepts of the *Andropogon gerardii - Schizachyrium scoparium* Northern Plains Herbaceous Vegetation association, the *Pascopyrum smithii - Nassella viridula* Herbaceous Vegetation association, and the *Poa pratensis* semi-natural herbaceous alliance of the NVCS and the overflow range site of the NRCS.

13 - Bluestem - Needlegrass-Wheatgrass Transition Prairie. A transition prairie between tallgrass prairie to the east and mixed prairie to the west generally occurring on soils derived from glacial materials (Clements 1920; Shantz 1923; Weaver and Fitzpatrick 1934; Weaver and Clements 1938; Kuchler 1964; Dix and Smeins 1967; Stewart 1975; Whitman and Barker 1994). Common species are *Schizachyrium scoparium, Hesperostipa spartea, Nassella viridula, Andropogon gerardii, Panicum virgatum, Pascopyrum smithii, Elymus trachycaulus, Hesperostipa comata, Bouteloua gracilis, Poa prantensis* and *Bromus inermis*. Dominance by a single species typically occurs only over small areas with most stands less than 0.1 ha in size. The complex distribution of species over short distances is believed to be largely determined by variability in plant available moisture and nutrients (Dix and Smeins 1967; Barnes et al. 1983). An outstanding feature of glacial till parent materials is their variability due to the diverse ways by which the debris was laid down, of differences in the chemical composition of the original materials and of fluctuation in the grinding action of the ice. Soils heterogeneity occurs over short distances with textures varying from sands, silts, sand, and clays. This map unit is most closely aligned with the concepts of the *Andropogon gerardii - Sporobolus heterolepis - Schizachyrium scoparium - Pascopyrum smithii* Herbaceous Vegetation association and the *Schizachyrium scoparium - Bouteloua curtipendula - Hesperostipa spartea* - (*Pascopyrum smithii*) Herbaceous Vegetation association of the NVCS and the thin upland range site of the NRCS.

14 - Wheatgrass Prairie. This vegetation occurs on nearly level to rolling landscapes with deep, well drained, medium to fine textured soils. Dominant graminoid species include *Pascopyrum smithii, Nassella viridula, Hesperostipa comata, and Bouteloua gracilis*. *Distichlis spicata* and *Opuntia fragilis* are often common and diagnostic species of sites with saline-alkali soils. *Artemisia tridentata spp. wyomingensis* and *Artemisia cana* can occur as scattered shrubs contributing little cover in some stands in the Missouri plateau physiographic region. This map unit corresponds to the concepts of the *Pascopyrum smithii* herbaceous alliance of the NVCS. The four associations within the alliance

include *Pascopyrum smithii - Bouteloua gracilis - Carex filifolia* Herbaceous Vegetation association, *Pascopyrum smithii - Hesperostipa comata* Central Mixedgrass Herbaceous Vegetation association, *Pascopyrum smithii - Nassella viridula* Herbaceous Vegetation, and *Pascopyrum smithii* - (*Elymus trachycaulus*) Clay Pan Herbaceous Vegetation. This map unit corresponds to concepts of the NRCS silty, clay, and clay pan range sites.

15 - Needlegrass Prairie. Dominant grasses are *Hesperostipa comata*, *Bouteloua gracilis*, and upland *Carex spp*. *Pascopyrum smithii* and *Calamovilfa longifolia* are abundant locally. This vegetation occurs on nearly level to rolling landscapes with shallow to deep, moderately coarse textured soils, with moderate permeability and low to moderate available water capacity. This map unit corresponds to the concepts of the *Hesperostipa comata - Bouteloua gracilis* Alliance of the NVCS and the sandy and shallow-to-gravel rangesites of the NRCS.

16- Little Bluestem Bunch Grass Prairie. This map unit represents a heterogeneous plant community where *Schizachyrium scoparium* is a common and conspicuous species. Other common graminoid species include *Carex filifolia*, *Hesperostipa comata*, and *Calamovilfa longifolia*. In western ND some stands, particulary on north facing slopes, may have small thickets and scattered individuals of *Juniperus horizontalis, Rhus trilobatus*, *Shepardia argentea*, *Artemisia cana*, *Amelanchier alnifolia*, *Yucca glauca*, and occasionally individuals of *Juniperus scopulorum* or *Fraxinus pennsylvanica*. The community occurs primarily on steep to moderately steep slopes on the sides and crests of hills. Soils are shallow, of coarse to moderately fine texture, overlaying sandstone, shale or siltstone parent materials that restrict rooting depth. This map unit corresponds to the concepts of the *Schizachyrium scoparium - Bouteloua* (*curtipendula, gracilis*) - *Carex filifolia* Herbaceous Vegetation association, the *Schizachyrium scoparium - Muhlenbergia cuspidata* Herbaceous Vegetation association, and *the Juniperus horizontalis / Schizachyrium scoparium* Dwarf-shrubland assocation of the NVCS. Hansen et al. (1984) described a *Schizachyrium scoparium/Carex filifolia* habitat type and a *Juniperus horizontalis/Andropgon scoparius* habitat type in Thedore Roosevelt National Park. Whitman (1979) described an *Schizachyrium scoparium-Hesperostipa comata- Carex filfolia* and a *Hesperostipa comata-Muhlenbergia-Carex stenophylla* communites similar in concept to the map unit. Redmann (1975) in a study within the Fort Berthold Indian Reservation in western ND reported *Schizachyrium scoparium* was the dominant species of stands on coarse textured soils occurring on upper slope positions but also on sandy, rolling uplands west of the Missouri River. Although, generally associated with relatively coarse textured soils, Hegstad (1973) reported *Schizachyrium scoparium* was a common species on hill slopes of clay soils in northwestern ND. The map unit corresponds to the concepts of the NRCS shallow and very shallow range sites.

17 - Fescue Prairie. *Heterostipa curtiseta* and *Agropyron dasystachyum* are diagnostic grass species for this land cover type type. Cosby (1965) reported local areas dominated by *Festuca scabrella* in the northern 1/3 of North Dakota with the best examples of the community located on Lostwood National Wildlife Refuge in the north western ND on north facing slopes and on soils of medium texture. Hegstad (1973) reported *Festuca scabrella* was present on loamy soil on the Missouri Coteau in northwest ND and was the dominant plant in some areas where no heavy grazing had occurred. In a personnel communication in 1992 with Karen Smith, refuge manager for Lostwood National Wildlife Refuge, she reported areas dominated by *Festuca scabrella* were uncommon. Coupland (1992) reported that abundance of *Festuca scaberlla* can be greatly reduced under moderate and heavy grazing which he speculated was related to its erect growth habitat and the ease with which close grazing can remove a large proportion of the photosynthetic tissue. Coupland (1992) also reported that the rarity of flowering stalks of *Festuca scabrella* in some years results in the grass being confused with other species of mixed prairie, particularly *Stipa curtiseta* and as a consequence the grassland is often not recognized as being distinctive from the mixed prairie. This prairie land cover category was identified primarily on the basis of range condition inventories on State School lands in northwestern ND where *Heterostipa curtiseta* and *Agropyron dasystachyum* were identified as important components of the forage biomass on a number of the properties. The map unit corresponds to the concepts of the *Festuca altaica* herbaceous alliance and the *Festuca campestris* herbaceous alliance of the NVCS and the thin upland range site of the NVCS.

18 - Sand Prairie. Diagnostic grasses include *Calamovilfa longifolia*, *Andropogon hallii*, *Hesperostipa comata*, *and Bouteloua gracilis*. Stands of this map unit occur on poorly to moderately well-developed, well or excessively drained coarse textured sand, loamy sand, or sandy loam soils. Topography ranges from nearly level to hilly and choppy wind-worked sand dunes. There is little runoff or evaporation because of the high permeability of the soil. Soil near the surface is consequently dry throughout much of the year, but moisture is present further down, favoring deep-rooting species. The map unit corresponds to the concepts of the *Andropogon hallii* herbaceous alliance, *Calamovilfa longifolia* herbaceous alliance, and *Schizachyrium scoparium*-(*Sporobolus cryptandrus*) herbaceous alliance of the NVCS and the sand range site of the NRCS.

19 - Saline Prairie. Characteristic grasses include *Distichlis spicata*, *Hordeum jubatum*, *Puccinellia nuttalliana* and *Spartina gracilis*. This map unit occurs in shallow basins and lake plains, low terraces and bottomlands along streams that receive additional water from seepage and/or runon with deep, poorly drained, medium and fine textured saline and alkaline soils. The map unit corresponds to concepts of the *Pascopyrum smithii* temporarily flooded herbaceous alliance, *Distichlis spicata* - (*Hordeum jubatum*) temporarily flooded herbaceous alliance, and *Hordeum jubatum* temporaily flooded herbaceous alliance of the NVCS and the saline lowland range site of the NRCS. Some areas of this land cover category

may be included in the palustrine temporarily flooded wetland land cover category from U.S. FWS National Wetlands Inventory data.

20 - Upland Deciduous Shrubland. Upland areas dominated by shrubs typically occur on sites where available soil moisture is greater than sites with prairie land cover types and less than sites with woodland land cover types. Sites include well-drained depressions and riparian areas, north and east facing slopes, and woodland edges. Stands are typically small and vary greatly in shrub density and species composition. The following species are dominants in different stands. *Symphoricarpos occidentalis* occupies upland depressions, mesic swales, and flood plains. *Shepherdia argentea, Prunus virginiana, Amelanchier alnifolia, Crataegus chrysocarpa, Elaeagnus commutata, Prunus americana* often occur as small, dense thickets in mesic swales and aspects, and the outer edges of floodplains and woodlands. *Rhus glabara* occurs on the edges of Bur Oak woodlands in eastern ND. *Rhus trilobata* occupies ridges, hills, and slopes associated with scoria outcrops in south western ND. *Toxicodendron radicans* often obtains greatest abundance on sandy soils. This map unit corresponds to the concepts of the deciduous shrubland alliances of the NVCS for the species identified above.

21 - Lowland Deciduous Shrubland. Depression and riparian areas dominated by shrubs with a high water table and high water availability. This map unit includes lands mapped by the U.S. FWS National Wetland Inventory as Palustrine scrub-shrub. *Salix interior* and *Salix amygdaloides* are common shrub species in this map unit. *Corylus cornuta*, a common understory species of Aspen and Bur Oak woodlands, occurs as dense riparian shrublands in Pembina Hills. This map unit corresponds to the concepts of the *Salix (exugua*, interior) temporarily flooded shrubland alliance and *Cornus sericea-Salix spp*. seasonally flooded shrubland alliance of the NVCS.

22 - Sagebrush Shrubland. Evergreen shrublands dominated by *Artemisia cana* and *Artemisia tridentata wyomingensis*. *Artemisia cana* stands are best developed on flood plains and river terraces on soils derived from alluvial deposits (Hanson et. al. 1984., Wali et al. 1980). *Artemisia tridentata wyomingensis* often occurs as smaller stands on older, higher benches above the *Artemisia cana* on the floodplains. *Artemisia tridentata wyomingensis* stands are best developed in extreme south western ND on rolling to hilly topography. Both species of sagebrush occur with sparse to low canopy coverage on nearly level to rolling uplands in southwestern North Dakota. Both sagebrush species also occurs as small patches in the complex topography of the Little Missouri Badlands. *Artemisia tridentata wyomingensis* is most common on small terraces or narrow benches that parallel the contours of hills while *Artemisia cana* archives its greatest abundance in and along drainages. *Symporicarpos occidentalis* is a common shrub in *Artemisia cana* floodplains. Common native herbaceous species include *Pascopyrum smithii* and *Hesperostipa comata*. *Euphorbia esula* has invaded some silver sagebrush stands. This map unit corresponds to the concepts

of the *Artemisa cana* shrubland alliance, *Artemesia tridentata spp. wyomingensis* shrubland alliance, *Artemisia cana* temporarily flooded shrubland alliance, *Artemisia cana spp. cana* herbaceous alliance, and the *Artemisia tridentata spp. wyomingensis* shrub herbaceous alliance of the NVCS.

30 - Ponderosa Pine Woodland. Woodlands dominated by *Pinus ponderosa* in the Little Missouri Badlands in southwestern ND represent the northeastern-most extent of the species geographical range. Stands occur on coarse, stratified outcroppings of sandstone or scoria. Associated tree and tall shrub species include *Juniperus scopulorum*, *Fraxiunus pennsylvanica*, *Prunus virginiana* and *Shepherdia argentea*. The low shrub community includes *Rhus trilobata*, *Symphoricarpos occidentalis, Juniperus communis*, and *Juniperius horizontalis*. Herbaceceous species include *Schizachyrium scoparium*, *Bouteloua curtipendula*, *Muhlenbergia cuspidata, Carex filifolia, Pseudoroegneria spicata and Calamovilfa longifolia.* This map unit corresponds to the *Pinus ponderosa* woodland alliance of the NVCS.

31 - Limber Pine Woodland. A single small stand of *Pinus flexilis* in association with *Juniperus scopulorum* located in the Little Missouri Badlands in southwestern ND. No other stands of *Pinus flexilis* are known in ND with the nearest stands for the species located about 160 miles to the south in the Black Hills of South Dakota. The small stand of *Pinus flexilis* may have been seeded, either accidentally or purposely, by Indians camping in the area before settlement by European man. *Rhus trilobata* is the dominant shrub. The map unit corresponds to the *Pinus flexilis* woodland alliance of the NVCS.

32 - Rocky Mountain Juniper Woodland. These woodlands occur primarly on steep north, north-east or north-west facing slopes and draws in the Little Missouri Badlands in western ND. Associated shrub species include *Symphoricarpos occidentalis, Rhus trilobata, Prunus virginiana, Amelanchier alnifolia, Sheperdia argentea, Juniperus communis, Juniperus horizontalis*, and *Rosa woodsii*. Characteristic herbaceous species include *Oryzopsis micrantha* and *Achillea millefolium*. *Juniperus scopulorum* is also common in cottowood stands along the Little Missiouri river and as a component of *Pinus ponderosa* wooodlands. The map unit corresponds to the *Juniperus scopulorum* woodland alliance of the NVCS.

33 - Mixed Deciduous and Conifer Woodland. Woodlands dominated by a mixture of *Juniperus scopulorum* and *Fraxiunus pennsylvanica* and occasionally *Quercus macrocarpa*. These sites generally have soil moisture availability intermediate between *Fraxinus pennsylvanica* and *Juniperus scopulorum* woodlands.

34 - Floodplain Woodland. Woodlands occurring on the floodplains of the Red River and its tributaries, the Sheyene River, James River, Souris River, Mouse River, Missouri River and its tributaries, and Little Missouri River. Dominant tree

species include *Fraxinus pennsylvanica*, *Ulmus americana*, and *Populus deltoides*. Other associated tree species include *Tilia americana*, *Quercus macrocarpa, Populus tremuloides*, *Acer negundo*, *Celtis occidentalis*, and *Juniperus scopulorum*. This map unit includes wetlands mapped by the National Wetland Inventory as Palustrine forested. The variability and diversity of floodplain forests decreases from east to west. Structure and composition of the forest overstory are strongly related to stand age and horizontal and vertical position on the floodplain (Johnson et al. 1976). This map unit is corresponds to the concepts of several temporarily flooded forest and woodland alliances in the NVCS.

35 - Deciduous Woodland. Woodlands dominated by mixtures of deciduous species including the native tree species *Fraxinus pennsylvanica*, *Quercus macrocarpa, Populus tremulodies, Ulmus americana,* and *Populus deltoides* and a wide variety of introduced deciduous and conifer tree species planted in shelterbelts, windbreaks and tree rows.

36 - Green Ash Woodland. Fraxinus pennsylvanica - *Ulmus americana* woodlands are the most common type of woodland in North Dakota. Stands occur on the upland edge of floodplain woodlands, in the bottom and sides of draws and ravines, and mesic, typically north and north east facing, slopes. *Acer negundo* is a common tree species in these woodlands. This map unit corresponds to the concepts of the *Fraxinus pennsylvanica* forest and woodland alliances of the NVCS.

37 - Aspen Woodland. Woodlands dominated by *Populus tremuloides*. The largest aspen woodlands are located in the Turtle Mountains, Killdeer Mountains, and a deltaic sand area of western Pembina County. Smaller widely scattered stands are located Sheyene and Souris sandhills, Pembina Hills, Missouri River breaks and Little Missouri River Badlands, and in association with wetlands where they reach their greatest importance in northwestern North Dakota. Aspen are an early successional species and have a relatively short live span compared to other trees in ND. Aspen is often transitory, gradually giving way to more shade tolerant species. Associated tree species include *Quercus macrocarpa, Fraxinus pennsylvanica , Betula papyrifera, Populus balsamifera*, and *Acer negundo*. *Corylus cornuta, Prunus virginiana*, and *Amelanchier alnifolia* are common shrubs in aspen woodlands. This map unit corresponds to the concepts of the *Populus tremuloides* forest and woodland alliances of the NVCS.

38 - Bur Oak Woodland. Woodlands dominated by *Quercus macrocarpa* generally occur in the bottom and sides of draws and ravines, and well drained upland areas on a wide range of slope angles and aspects. *Populus tremulodies* and *Fraxinus pennsylvanica* are associated tree species in some stands. Associated shrub species include *Corylus cornuta, Prunus virginiana*, *Amelanchier alnifolia*, and *Symphoricarpos occidentalis*. *Carex pensylvanica* is a common herbaceous understory species in the more mesic stands. This map unit

corresponds to the concepts of the *Quercus macrocara* forest and woodland alliance of the NVCS.

39 - Aspen-Bur Oak Woodland. Woodlands dominated by a mixture of *Quercus macrocarpa and Populus tremuloides.*

40 - Lacustrine Wetland. Wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel, (2) lacking trees, shrubs, persistent emergents, emergent mosses or lichens with greater than 30% areal coverage.

41 - Riverine Wetland. Wetlands and deepwater habitats contained within a channel, with the following exception (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water. This map unit was created from U.S. Fish and Wildlife Service National Wetlands Inventory Data.

42 – Palustrine Temporary Wetland. Wetlands dominated by persistent emergents or aquatic beds where surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface. Plants that grow both in uplands and wetlands may be characteristic of this water regime. This map unit was created from U.S. Fish and Wildlife Service National Wetlands Inventory Data.

43 - Palustrine Seasonal Wetland. Wetlands dominated by persistent emergents or aquatic beds where surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface. This map unit was created from U.S. Fish and Wildlife Service National Wetlands Inventory Data.

44 - Palustrine Semipermanent Wetland. Wetlands dominated by persistent emergents or aquatic beds where surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land's surface. This map unit was created from U.S. Fish and Wildlife Service National Wetlands Inventory Data.

45 - Water. Surface water identified from analysis of Landsat Thematic Mapper imagery that was not identified as wetlands in the U.S. Fish and Wildlife Service National Wetland Inventory Data. This land cover category can include an increase in the area of wetlands since the creation of the NWI data, edge effects related to resampling the NWI vectors to a raster format, and omission errors in NWI.

50 - Barren Land - lands characterized by rock, gravel, sand, or soil and the absence or low abundance of vegetation. Examples include mines, roads, oil pads and other anthropogenic or natural disturbances that result in the loss of vegetation.

51 - Sparse Vegetation - Badlands. Steep, primarily south and west facing slopes with less than < 20% vegetation cover in the Little Missouri Badlands and flats formed from mudstone, claystone, siltstone and scoria. Xeric shrubs species from *Artemisia, Chrysothamnus*, and *Atriplex* genera are often the principal vegetation.

52 - Sparse Vegetation - Riverine. Sparsely vegetated gravel and sand bars along the Missouri river.

60 - Developed - High Intensity Residential. Highly developed areas where people reside in high numbers. Examples include apartment complexes and row houses. Vegetation accounts for less than 20% of the land cover. This map unit was created from the 1992 National Land Cover Data for North Dakota.

61 - Developed - Low Intensity Residential. Lands consisting of a mixture of constructed materials and vegetation. Constructed materials account for 30-80 percent of the land cover. Vegetation may account for 20-70 percent of the cover. These areas most commonly include single-family housing units. Population densities are lower than in high intensity residential areas. This map unit was created from the 1992 National Land Cover Data for North Dakota.

62 - Developed - Commercial/industrial/transportation. Infrastructure such as roads, railroads, airports and other highly developed areas not classified as high intensity residential. This map unit was created from the 1992 National Land Cover Data for North Dakota.

63 - Developed - Urban Grasslands. Lands planted to primarily grasses in developed settings for recreation, erosion control or aesthetic purposes. Examples include parks, lawns, golf courses, airport grasslands, and industrial site grasslands. This map unit was created from the 1992 National Land Cover Data for North Dakota.

64 - Developed - Recently Developed. Areas that have been recently developed or were omissions in the developed land cover categories in the 1992 North Dakota National Land Cover data.

Appendix 2.3 Overall accuracy probabilities for North Dakota and physiographic regions.					
	N	Mean	Standard error	95% Confidence interval	
Overall accuracy	238	0.615894	0.009942	0.59630638	0.63548241

Overall accuracy by physiographic region					
Physiographic region	N	Mean	Standard error	95% Confidence interval	
Missouri Coteau	65	0.593040	0.017376	0.55832763	0.62775169
Missouri Plateau	71	0.616491	0.020920	0.57476836	0.65821452
Drift Prairie	64	0.613183	0.018138	0.57693588	0.64942925
Glacial Lake Agazzi	38	0.657682	0.022953	0.61117549	0.70418878

Appendix 2.4 Producer accuracy probabilities for 8 land cover categories at upper level of land cover classification system for North Dakota.					
Land cover[1]	N	Mean	Standard error	95% Confidence interval	
sparse vegetation	140	0.238175	0.038031	0.1629070	0.31344266
cropland	194	0.823604	0.011166	0.8015688	0.8456388
planted grassland	224	0.443401	0.017762	0.4083845	0.4784182
prairie	203	0.624273	0.018291	0.5881885	0.66035682
shrubland	151	0.122832	0.01742	0.0883804	0.15728313
urban	138	0.078455	0.045548	-0.0117112	0.16862126
wetland	221	0.560103	0.023956	0.5128719	0.60733484
woodland	218	0.479300	0.045208	0.3901603	0.5684396

[1] Planted grassland used as shorthand for planted herbaceous perennials.

Appendix 2.5 User accuracy probabilities for 8 land cover categories at upper level of land cover classification system for North Dakota.					
Land cover[1]	N	Mean	Standard error	95% Confidence interval	
sparse vegetation	85	0.278429	0.041538	0.19568	0.361178
cropland	235	0.772035	0.012463	0.747473	0.796597
planted grassland	238	0.511307	0.024242	0.463533	0.559081
prairie	235	0.543092	0.023657	0.496467	0.589717
shrubland	150	0.150347	0.01862	0.11352	0.187175
urban	36	0.145251	0.05183	0.037135	0.253368
wetland	232	0.560685	0.026751	0.507958	0.613412
woodland	213	0.620324	0.043012	0.535501	0.705147

[1] Planted grassland used as shorthand for planted herbaceous perennials.

Appendix 2.6 Producer accuracy probabilities for 8 land cover categories at upper level of land cover classification system by physiographic region.						
Physiographic region	Land cover[1]	N	Mean	Standard error	95% Confidence interval	
Missouri Coteau	sparse vegetation	43	0.00629	0.00436	-0.00252	0.01509
Missouri Coteau	cropland	50	0.78255	0.03162	0.719	0.84609
Missouri Coteau	planted grassland	63	0.45209	0.02892	0.39427	0.5099
Missouri Coteau	prairie	56	0.71274	0.02639	0.65986	0.76561
Missouri Coteau	shrubland	50	0.06428	0.02094	0.0222	0.10637
Missouri Coteau	urban	32	0	0	0	0
Missouri Coteau	wetland	65	0.60551	0.03212	0.54135	0.66968
Missouri Coteau	woodland	59	0.06592	0.0176	0.0307	0.10114
Missouri Plateau	sparse vegetation	50	0.31612	0.03978	0.23617	0.39607
Missouri Plateau	cropland	60	0.85878	0.024	0.81076	0.90679
Missouri Plateau	planted grassland	64	0.4601	0.03825	0.38366	0.53654
Missouri Plateau	prairie	67	0.58219	0.03007	0.52216	0.64222
Missouri Plateau	shrubland	47	0.19037	0.02583	0.13838	0.24236
Missouri Plateau	urban	42	0.01237	0.01117	-0.01019	0.03493
Missouri Plateau	wetland	60	0.40174	0.06898	0.2637	0.53977
Missouri Plateau	woodland	61	0.23606	0.03993	0.15619	0.31592
Drift Prairie	sparse vegetation	34	0	0	0	0
Drift Prairie	cropland	55	0.81774	0.02465	0.76833	0.86716
Drift Prairie	planted grassland	62	0.41349	0.03354	0.34643	0.48054
Drift Prairie	prairie	49	0.53155	0.06588	0.39909	0.66401
Drift Prairie	shrubland	31	0.15532	0.04789	0.05752	0.25311
Drift Prairie	urban	42	0.12967	0.10879	-0.09002	0.34937
Drift Prairie	wetland	64	0.54105	0.03757	0.46598	0.61612
Drift Prairie	woodland	61	0.58476	0.07148	0.44178	0.72773
Glacial Lake Agazzi	cropland	29	0.82452	0.02406	0.77524	0.8738
Glacial Lake Agazzi	planted grassland	35	0.44558	0.06164	0.32032	0.57085
Glacial Lake Agazzi	prairie	31	0.69252	0.03214	0.62688	0.75817
Glacial Lake Agazzi	shrubland	23	0.03976	0.02954	-0.02151	0.10102
Glacial Lake Agazzi	urban	22	0.11394	0.07043	-0.03252	0.2604
Glacial Lake Agazzi	wetland	32	0.56902	0.10235	0.36027	0.77776
Glacial Lake Agazzi	woodland	37	0.53984	0.05194	0.43451	0.64517

[1] Planted grassland used as shorthand for planted herbaceous perennials.

Appendix 2.7 User accuracy probabilities for 8 land cover categories at upper level of land cover category classification system by physiographic region.						
Strata	Land cover[1]	N	Mean	Standard error	95% Confidence Interval	
Missouri Coteau	sparse vegetation	19	0.01263	0.010723	-0.0099	0.03515
Missouri Coteau	cropland	65	0.71451	0.034207	0.64617	0.78284
Missouri Coteau	planted grassland	65	0.56194	0.036642	0.48874	0.63515
Missouri Coteau	prairie	65	0.48959	0.036951	0.41577	0.56341
Missouri Coteau	shrubland	43	0.14449	0.041552	0.06063	0.22834
Missouri Coteau	urban	9	0	0	0	0
Missouri Coteau	wetland	65	0.68606	0.037607	0.61093	0.76119
Missouri Coteau	woodland	51	0.21579	0.04587	0.12366	0.30792
Missouri Plateau	sparse vegetation	60	0.30446	0.043421	0.21757	0.39135
Missouri Plateau	cropland	71	0.78538	0.027484	0.73057	0.8402
Missouri Plateau	planted grassland	71	0.49302	0.050663	0.39198	0.59407
Missouri Plateau	prairie	69	0.61345	0.030704	0.55218	0.67472
Missouri Plateau	shrubland	62	0.17353	0.028232	0.11708	0.22998
Missouri Plateau	urban	7	0.04124	0.028348	-0.02813	0.1106
Missouri Plateau	wetland	65	0.38321	0.060853	0.26164	0.50478
Missouri Plateau	woodland	65	0.33841	0.034687	0.26912	0.40771
Drift prairie	sparse vegetation	6	0	0	0	0
Drift prairie	cropland	64	0.77034	0.02501	0.72036	0.82032
Drift prairie	planted grassland	64	0.46848	0.047726	0.3731	0.56385
Drift prairie	prairie	63	0.45204	0.066253	0.3196	0.58448
Drift prairie	shrubland	36	0.10937	0.032716	0.04295	0.17579
Drift prairie	urban	14	0.14832	0.086332	-0.03819	0.33483
Drift prairie	wetland	64	0.57124	0.039686	0.49193	0.65055
Drift prairie	woodland	62	0.72979	0.053629	0.62255	0.83702
Glacial Lake Agazzi	cropland	35	0.83301	0.028304	0.77549	0.89053
Glacial Lake Agazzi	planted grassland	38	0.5272	0.069212	0.38696	0.66744
Glacial Lake Agazzi	prairie	38	0.61946	0.077324	0.46279	0.77613
Glacial Lake Agazzi	shrubland	9	0.06633	0.028821	-0.00014	0.13279
Glacial Lake Agazzi	urban	6	0.30797	0.051674	0.17514	0.4408
Glacial Lake Agazzi	wetland	38	0.37841	0.08595	0.20426	0.55256
Glacial Lake Agazzi	woodland	35	0.6232	0.055926	0.50954	0.73685

[1] Planted grassland used as shorthand for planted herbaceous perennials.

Appendix 2.8 Producer accuracy probabilities for 8 land cover categories at upper level of land cover classification system for 4 anthropogenic land cover proportion strata by physiographic region.						
Strata[1]	Land cover[2]	N	Mean	Standard error	95% Confidence Interval	
Missouri Coteau_1	sparse vegetation	4	0.03797	0.03991	-0.08904	0.16499
Missouri Coteau_1	cropland	3	0.01188	0.00494	-0.00938	0.03313
Missouri Coteau_1	planted grassland	13	0.61599	0.03869	0.53168	0.70029
Missouri Coteau_1	prairie	11	0.81319	0.03503	0.73513	0.89125
Missouri Coteau_1	shrubland	12	0.0042	0.00324	-0.00293	0.01132
Missouri Coteau_1	urban	4	0	0	0	0
Missouri Coteau_1	wetland	14	0.66162	0.03429	0.58754	0.73571
Missouri Coteau_1	woodland	12	0.04773	0.03594	-0.03138	0.12684
Missouri Coteau_2	sparse vegetation	13	0.00509	0.0047	-0.00514	0.01532
Missouri Coteau_2	cropland	14	0.57436	0.05977	0.44525	0.70348
Missouri Coteau_2	planted grassland	17	0.48086	0.04144	0.393	0.56872
Missouri Coteau_2	prairie	15	0.70973	0.02619	0.65355	0.7659
Missouri Coteau_2	shrubland	14	0.07799	0.04132	-0.01128	0.16726
Missouri Coteau_2	urban	8	0	0	0	0
Missouri Coteau_2	wetland	17	0.6707	0.07444	0.5129	0.82849
Missouri Coteau_2	woodland	15	0.08869	0.0355	0.01255	0.16483
Missouri Coteau_3	sparse vegetation	18	0	0	0	0
Missouri Coteau_3	cropland	23	0.79241	0.03864	0.71228	0.87255
Missouri Coteau_3	planted grassland	23	0.31815	0.03811	0.23913	0.39718
Missouri Coteau_3	prairie	24	0.61093	0.04492	0.518	0.70386
Missouri Coteau_3	shrubland	21	0.09396	0.03025	0.03085	0.15707
Missouri Coteau_3	urban	16	0	0	0	0
Missouri Coteau_3	wetland	24	0.5126	0.03257	0.44523	0.57997
Missouri Coteau_3	woodland	23	0.07193	0.02567	0.0187	0.12516
Missouri Coteau_4	sparse vegetation	8	0	0	0	0
Missouri Coteau_4	cropland	10	0.90234	0.02297	0.85038	0.9543
Missouri Coteau_4	planted grassland	10	0.17653	0.04084	0.08415	0.2689
Missouri Coteau_4	prairie	6	0.73174	0.15476	0.33391	1.12957
Missouri Coteau_4	shrubland	3	0	0	0	0
Missouri Coteau_4	urban	4	0	0	0	0
Missouri Coteau_4	wetland	10	0.4251	0.05815	0.29356	0.55663
Missouri Coteau_4	woodland	9	0.01	0.00859	-0.0098	0.0298
Missouri Plateau_1	sparse vegetation	13	0.33956	0.04616	0.23898	0.44015
Missouri Plateau_1	cropland	7	0.52375	0.09768	0.28475	0.76276
Missouri Plateau_1	planted grassland	10	0.55242	0.11069	0.30202	0.80281
Missouri Plateau_1	prairie	16	0.58779	0.05197	0.47701	0.69857
Missouri Plateau_1	shrubland	13	0.21168	0.03094	0.14426	0.2791
Missouri Plateau_1	urban	10	0.03073	0.03012	-0.03742	0.09887
Missouri Plateau_1	wetland	11	0.3645	0.08025	0.1857	0.5433
Missouri Plateau_1	woodland	16	0.30993	0.04832	0.20693	0.41292
Missouri Plateau_2	sparse vegetation	17	0.31501	0.10331	0.096	0.53402
Missouri Plateau_2	cropland	19	0.76496	0.03114	0.69954	0.83038
Missouri Plateau_2	planted grassland	21	0.50998	0.04537	0.41533	0.60462
Missouri Plateau_2	prairie	20	0.62152	0.05278	0.51106	0.73199

Appendix 2.8 Producer accuracy probabilities for 8 land cover categories at upper level of land cover classification system for 4 anthropogenic land cover proportion strata by physiographic region (continued).						
Strata[1]	Land cover[2]	N	Mean	Standard error	95% Confidence Interval	
Missouri Plateau_2	shrubland	16	0.14629	0.05783	0.02304	0.26955
Missouri Plateau_2	urban	15	0.00444	0.00471	-0.00566	0.01455
Missouri Plateau_2	wetland	18	0.44123	0.15021	0.12433	0.75814
Missouri Plateau_2	woodland	19	0.16089	0.05407	0.0473	0.27448
Missouri Plateau_3	sparse vegetation	17	0.10632	0.05317	-0.00639	0.21904
Missouri Plateau_3	cropland	24	0.84798	0.04018	0.76486	0.9311
Missouri Plateau_3	planted grassland	23	0.39122	0.06657	0.25316	0.52929
Missouri Plateau_3	prairie	24	0.52019	0.03643	0.44483	0.59555
Missouri Plateau_3	shrubland	16	0.17443	0.02743	0.11598	0.23289
Missouri Plateau_3	urban	15	0	0	0	0
Missouri Plateau_3	wetland	23	0.35886	0.06689	0.22014	0.49758
Missouri Plateau_3	woodland	17	0.16762	0.0808	-0.00367	0.3389
Missouri Plateau_4	sparse vegetation	3	0	0	0	0
Missouri Plateau_4	cropland	10	0.95212	0.00959	0.93043	0.97382
Missouri Plateau_4	planted grassland	10	0.18825	0.02954	0.12143	0.25507
Missouri Plateau_4	prairie	7	0.06161	0.02309	0.0051	0.11812
Missouri Plateau_4	shrubland	2	0.01818	0.00661	-0.06578	0.10215
Missouri Plateau_4	urban	2	0	0	0	0
Missouri Plateau_4	wetland	8	0.50157	0.15037	0.146	0.85713
Missouri Plateau_4	woodland	9	0.08911	0.05689	-0.04207	0.22029
Drift Prairie_1	sparse vegetation	7	0	0	0	0
Drift Prairie_1	cropland	4	0.22706	0.15657	-0.27121	0.72533
Drift Prairie_1	planted grassland	9	0.55413	0.02131	0.50499	0.60327
Drift Prairie_1	prairie	9	0.7404	0.0844	0.54578	0.93502
Drift Prairie_1	shrubland	7	0.16745	0.10685	-0.09399	0.42889
Drift Prairie_1	urban	4	0	0	0	0
Drift Prairie_1	wetland	11	0.52003	0.0761	0.35046	0.6896
Drift Prairie_1	woodland	11	0.77223	0.07875	0.59676	0.94771
Drift Prairie_2	sparse vegetation	5	0	0	0	0
Drift Prairie_2	cropland	12	0.59861	0.08247	0.4171	0.78012
Drift Prairie_2	planted grassland	13	0.50431	0.05748	0.37907	0.62955
Drift Prairie_2	prairie	13	0.36809	0.06765	0.2207	0.51548
Drift Prairie_2	shrubland	7	0.17425	0.05157	0.04806	0.30044
Drift Prairie_2	urban	10	0.01966	0.01432	-0.01273	0.05205
Drift Prairie_2	wetland	13	0.64438	0.06495	0.50287	0.78589
Drift Prairie_2	woodland	12	0.56225	0.08184	0.38212	0.74238
Drift Prairie_3	sparse vegetation	19	0	0	0	0
Drift Prairie_3	cropland	29	0.79412	0.03119	0.73022	0.85802
Drift Prairie_3	planted grassland	30	0.35242	0.04694	0.25641	0.44843
Drift Prairie_3	prairie	22	0.46943	0.05515	0.35474	0.58412
Drift Prairie_3	shrubland	15	0.11221	0.06261	-0.02208	0.24649
Drift Prairie_3	urban	22	0.00357	0.00103	0.00143	0.0057
Drift Prairie_3	wetland	30	0.50902	0.05264	0.40136	0.61669
Drift Prairie_3	woodland	28	0.39155	0.09309	0.20054	0.58255
Drift Prairie_4	sparse vegetation	3	0	0	0	0
Drift Prairie_4	cropland	10	0.93437	0.00855	0.91502	0.95372

Appendix 2.8 Producer accuracy probabilities for 8 land cover categories at upper level of land cover classification system for 4 anthropogenic land cover proportion strata by physiographic region (continued).						
Strata[1]	Land cover[2]	N	Mean	Standard error	95% Confidence Interval	
Drift Prairie_4	planted grassland	10	0.09112	0.02405	0.03671	0.14552
Drift Prairie_4	prairie	5	0.05431	0.02693	-0.02046	0.12907
Drift Prairie_4	shrubland	2	0.15	0.015	-0.04059	0.34059
Drift Prairie_4	urban	6	0.53103	0.11001	0.24824	0.81383
Drift Prairie_4	wetland	10	0.34107	0.06792	0.18743	0.49471
Drift Prairie_4	woodland	10	0.10125	0.03596	0.01991	0.18259
Glacial Lake Agazzi_1	cropland	5	0.47841	0.15778	0.04033	0.91649
Glacial Lake Agazzi_1	planted grassland	8	0.60128	0.13847	0.27386	0.92871
Glacial Lake Agazzi_1	prairie	10	0.70631	0.04024	0.61528	0.79733
Glacial Lake Agazzi_1	shrubland	8	0.03747	0.03969	-0.05637	0.13131
Glacial Lake Agazzi_1	urban	5	0.03106	0.02393	-0.03538	0.09749
Glacial Lake Agazzi_1	wetland	9	0.36296	0.13728	0.04638	0.67954
Glacial Lake Agazzi_1	woodland	10	0.59521	0.12345	0.31594	0.87448
Glacial Lake Agazzi_2	cropland	5	0.59061	0.06812	0.40148	0.77974
Glacial Lake Agazzi_2	planted grassland	9	0.41805	0.07867	0.23663	0.59947
Glacial Lake Agazzi_2	prairie	9	0.73477	0.0501	0.61923	0.8503
Glacial Lake Agazzi_2	shrubland	6	0	0	0	0
Glacial Lake Agazzi_2	urban	7	0	0	0	0
Glacial Lake Agazzi_2	wetland	9	0.80136	0.06379	0.65426	0.94846
Glacial Lake Agazzi_2	woodland	9	0.48528	0.05109	0.36747	0.60309
Glacial Lake Agazzi_3	cropland	9	0.78187	0.03024	0.71213	0.85161
Glacial Lake Agazzi_3	planted grassland	9	0.35583	0.05001	0.24051	0.47116
Glacial Lake Agazzi_3	prairie	7	0.36643	0.07613	0.18015	0.55271
Glacial Lake Agazzi_3	shrubland	5	0.11494	0.12569	-0.23404	0.46392
Glacial Lake Agazzi_3	urban	7	0.26556	0.10651	0.00495	0.52617
Glacial Lake Agazzi_3	wetland	8	0.41513	0.08343	0.21785	0.6124
Glacial Lake Agazzi_3	woodland	9	0.60826	0.07451	0.43643	0.78009
Glacial Lake Agazzi_4	cropland	10	0.89367	0.02104	0.84607	0.94126
Glacial Lake Agazzi_4	planted grassland	9	0.14209	0.03242	0.06734	0.21684
Glacial Lake Agazzi_4	prairie	5	0.09474	0.03278	0.00373	0.18574
Glacial Lake Agazzi_4	shrubland	4	0	0	0	0
Glacial Lake Agazzi_4	urban	3	0.36364	0.18773	-0.4441	1.17137
Glacial Lake Agazzi_4	wetland	6	0.62733	0.09071	0.39414	0.86051
Glacial Lake Agazzi_4	woodland	9	0.19862	0.06428	0.0504	0.34685

[1] 1-Anthropogenic land cover proportion strata 0-25%, 2- Anthropogenic land cover proportion strata 26-50%, 3- Anthropogenic land cover proportion strata 51-75%, 4-Anthropogenic land cover proportion strata 76-100%.

[2] Planted grassland used as shorthand for planted herbaceous perennials.

Appendix 2.9 User accuracy probabilities for 8 land cover categories at upper level of land cover classification system for 4 anthropogenic land cover proportion strata by physiographic region.						
Strata[1]	Land cover[2]	N	Mean	Standard error	95% Confidence interval	
Missouri Coteau_1	sparse vegetation	2	0.23077	0.14191	-1.57237	2.03391
Missouri Coteau_1	cropland	14	0.01753	0.01586	-0.01673	0.05178
Missouri Coteau_1	planted grassland	14	0.65482	0.04309	0.56173	0.74792
Missouri Coteau_1	prairie	14	0.54978	0.08465	0.3669	0.73266
Missouri Coteau_1	shrubland	7	0.02381	0.01275	-0.0074	0.05502
Missouri Coteau_1	urban	1	0	.	.	.
Missouri Coteau_1	wetland	14	0.84092	0.0383	0.75817	0.92366
Missouri Coteau_1	woodland	13	0.22222	0.11036	-0.01824	0.46268
Missouri Coteau_2	sparse vegetation	4	0.03333	0.03357	-0.07349	0.14015
Missouri Coteau_2	cropland	17	0.47649	0.08449	0.29737	0.65561
Missouri Coteau_2	planted grassland	17	0.60853	0.06974	0.4607	0.75636
Missouri Coteau_2	prairie	17	0.44907	0.051	0.34095	0.55718
Missouri Coteau_2	shrubland	13	0.16848	0.07697	0.00079	0.33618
Missouri Coteau_2	urban	5	0	0	0	0
Missouri Coteau_2	wetland	17	0.7611	0.06425	0.6249	0.89731
Missouri Coteau_2	woodland	12	0.2439	0.10778	0.00667	0.48113
Missouri Coteau_3	sparse vegetation	7	0	0	0	0
Missouri Coteau_3	cropland	24	0.69113	0.0427	0.6028	0.77947
Missouri Coteau_3	planted grassland	24	0.41985	0.06832	0.27852	0.56117
Missouri Coteau_3	prairie	24	0.47627	0.03502	0.40383	0.54871
Missouri Coteau_3	shrubland	20	0.15611	0.05711	0.03658	0.27564
Missouri Coteau_3	urban	1	0	.	.	.
Missouri Coteau_3	wetland	24	0.56081	0.04355	0.47072	0.65091
Missouri Coteau_3	woodland	22	0.22368	0.06003	0.09884	0.34853
Missouri Coteau_4	sparse vegetation	6	0	0	0	0
Missouri Coteau_4	cropland	10	0.87875	0.02624	0.81938	0.93811
Missouri Coteau_4	planted grassland	10	0.35557	0.10439	0.11943	0.59171
Missouri Coteau_4	prairie	10	0.32891	0.17931	-0.07671	0.73454
Missouri Coteau_4	shrubland	3	0	0	0	0
Missouri Coteau_4	urban	2	0	0	0	0
Missouri Coteau_4	wetland	10	0.33874	0.03533	0.25883	0.41866
Missouri Coteau_4	woodland	4	0.04	0.05117	-0.12284	0.20284
Missouri Plateau_1	sparse vegetation	14	0.38207	0.03453	0.30748	0.45666
Missouri Plateau_1	cropland	16	0.5022	0.12747	0.23052	0.77389
Missouri Plateau_1	planted grassland	16	0.39576	0.13851	0.10054	0.69099
Missouri Plateau_1	prairie	16	0.61964	0.04795	0.51745	0.72184
Missouri Plateau_1	shrubland	14	0.23555	0.041	0.14697	0.32413
Missouri Plateau_1	urban	2	0.10185	0.00566	0.02996	0.17374
Missouri Plateau_1	wetland	13	0.29563	0.09458	0.08955	0.50171
Missouri Plateau_1	woodland	16	0.38253	0.03941	0.29852	0.46653
Missouri Plateau_2	sparse vegetation	16	0.25773	0.12438	-0.00738	0.52284
Missouri Plateau_2	cropland	21	0.61891	0.06081	0.49205	0.74576
Missouri Plateau_2	planted grassland	21	0.58953	0.06891	0.44577	0.73328
Missouri Plateau_2	prairie	21	0.62024	0.05491	0.5057	0.73477
Missouri Plateau_2	shrubland	19	0.11298	0.04506	0.01832	0.20764

Appendix 2.9 User accuracy probabilities for 8 land cover categories at upper level of land cover classification system for 4 anthropogenic land cover proportion strata by physiographic region (continued).						
Strata[1]	Land cover[2]	N	Mean	Standard error	95% Confidence interval	
Missouri Plateau_2	urban	2	0.01695	0.00632	-0.06335	0.09724
Missouri Plateau_2	wetland	20	0.45551	0.12442	0.1951	0.71592
Missouri Plateau_2	woodland	20	0.25922	0.05866	0.13644	0.38201
Missouri Plateau_3	sparse vegetation	23	0.06208	0.03602	-0.01262	0.13679
Missouri Plateau_3	cropland	24	0.77674	0.04184	0.69019	0.86329
Missouri Plateau_3	planted grassland	24	0.44123	0.0833	0.26892	0.61355
Missouri Plateau_3	prairie	24	0.60988	0.05277	0.50071	0.71905
Missouri Plateau_3	shrubland	23	0.08397	0.03267	0.01623	0.15172
Missouri Plateau_3	urban	2	0	0	0	0
Missouri Plateau_3	wetland	23	0.39169	0.06496	0.25698	0.52641
Missouri Plateau_3	woodland	21	0.28144	0.09427	0.08478	0.47809
Missouri Plateau_4	sparse vegetation	7	0	0	0	0
Missouri Plateau_4	cropland	10	0.91896	0.01868	0.87671	0.9612
Missouri Plateau_4	planted grassland	10	0.36512	0.04908	0.25409	0.47614
Missouri Plateau_4	prairie	8	0.06147	0.03477	-0.02075	0.14368
Missouri Plateau_4	shrubland	6	0.01408	0.01211	-0.01705	0.04522
Missouri Plateau_4	urban	1	0	.	.	.
Missouri Plateau_4	wetland	9	0.24427	0.10569	0.00055	0.488
Missouri Plateau_4	woodland	8	0.34177	0.1684	-0.05643	0.73998
Drift prairie_1	cropland	11	0.18694	0.13806	-0.12067	0.49455
Drift prairie_1	planted grassland	11	0.59323	0.11268	0.34217	0.84429
Drift prairie_1	prairie	11	0.6524	0.10688	0.41426	0.89053
Drift prairie_1	shrubland	7	0.22153	0.04215	0.11839	0.32467
Drift prairie_1	urban	4	0	0	0	0
Drift prairie_1	wetland	11	0.592	0.07204	0.43148	0.75252
Drift prairie_1	woodland	11	0.80992	0.07097	0.65179	0.96804
Drift prairie_2	sparse vegetation	2	0	0	0	0
Drift prairie_2	cropland	13	0.53287	0.08626	0.34493	0.72082
Drift prairie_2	planted grassland	13	0.51964	0.07623	0.35356	0.68573
Drift prairie_2	prairie	13	0.38997	0.08329	0.2085	0.57143
Drift prairie_2	shrubland	9	0.08463	0.03443	0.00522	0.16403
Drift prairie_2	urban	3	0.17949	0.06218	-0.08807	0.44705
Drift prairie_2	wetland	13	0.62304	0.08938	0.42829	0.81779
Drift prairie_2	woodland	13	0.68801	0.08242	0.50842	0.86759
Drift prairie_3	sparse vegetation	4	0	0	0	0
Drift prairie_3	cropland	30	0.76927	0.02819	0.71161	0.82692
Drift prairie_3	planted grassland	30	0.39127	0.06878	0.25059	0.53194
Drift prairie_3	prairie	30	0.29033	0.05303	0.18188	0.39879
Drift prairie_3	shrubland	13	0.10168	0.05084	-0.00909	0.21244
Drift prairie_3	urban	5	0.00885	0.01057	-0.02049	0.03818
Drift prairie_3	wetland	30	0.57683	0.05406	0.46626	0.68739
Drift prairie_3	woodland	29	0.61712	0.06508	0.48381	0.75044
Drift prairie_4	cropland	10	0.84738	0.0475	0.73993	0.95483
Drift prairie_4	planted grassland	10	0.2465	0.06781	0.0931	0.39991
Drift prairie_4	prairie	9	0.09871	0.04203	0.00178	0.19564
Drift prairie_4	shrubland	7	0.00633	0.00628	-0.00905	0.02171

Appendix 2.9 User accuracy probabilities for 8 land cover categories at upper level of land cover classification system for 4 anthropogenic land cover proportion strata by physiographic region (continued).						
Strata[1]	Land cover[2]	N	Mean	Standard error	95% Confidence interval	
Drift prairie_4	urban	2	0.30616	0.02435	-0.00318	0.61551
Drift prairie_4	wetland	10	0.28664	0.06328	0.1435	0.42979
Drift prairie_4	woodland	9	0.36161	0.08124	0.17426	0.54895
Glacial Lake Agazzi_1	cropland	7	0.4776	0.21834	-0.05666	1.01186
Glacial Lake Agazzi_1	planted grassland	10	0.68468	0.10335	0.45089	0.91847
Glacial Lake Agazzi_1	prairie	10	0.66499	0.12811	0.37518	0.9548
Glacial Lake Agazzi_1	shrubland	3	0.08466	0.00567	0.06027	0.10904
Glacial Lake Agazzi_1	urban	3	0.10638	0.14502	-0.51757	0.73033
Glacial Lake Agazzi_1	wetland	10	0.25851	0.06944	0.10142	0.41561
Glacial Lake Agazzi_1	woodland	10	0.7001	0.126	0.41507	0.98514
Glacial Lake Agazzi_2	cropland	9	0.51153	0.16324	0.1351	0.88796
Glacial Lake Agazzi_2	planted grassland	9	0.54219	0.11481	0.27743	0.80695
Glacial Lake Agazzi_2	prairie	9	0.66079	0.08294	0.46954	0.85204
Glacial Lake Agazzi_2	shrubland	4	0	0	0	0
Glacial Lake Agazzi_2	urban	1	0	.	.	.
Glacial Lake Agazzi_2	wetland	9	0.5533	0.15998	0.1844	0.9222
Glacial Lake Agazzi_2	woodland	8	0.64244	0.07798	0.45803	0.82684
Glacial Lake Agazzi_3	cropland	9	0.79069	0.04121	0.69567	0.88571
Glacial Lake Agazzi_3	planted grassland	9	0.45528	0.09551	0.23504	0.67551
Glacial Lake Agazzi_3	prairie	9	0.19805	0.06677	0.04408	0.35201
Glacial Lake Agazzi_3	shrubland	1	0.22727	.	.	.
Glacial Lake Agazzi_3	urban	1	0.34783	.	.	.
Glacial Lake Agazzi_3	wetland	9	0.23343	0.0314	0.16103	0.30583
Glacial Lake Agazzi_3	woodland	8	0.64252	0.05949	0.50184	0.78321
Glacial Lake Agazzi_4	cropland	10	0.92394	0.01716	0.88511	0.96276
Glacial Lake Agazzi_4	planted grassland	10	0.12078	0.02946	0.05415	0.18742
Glacial Lake Agazzi_4	prairie	10	0.09677	0.04493	-0.00488	0.19842
Glacial Lake Agazzi_4	shrubland	1	0	.	.	.
Glacial Lake Agazzi_4	urban	1	0.37209	.	.	.
Glacial Lake Agazzi_4	wetland	10	0.36429	0.16448	-0.00779	0.73637
Glacial Lake Agazzi_4	woodland	9	0.1791	0.07254	0.01183	0.34638

[1] 1-Anthropogenic land cover proportion strata 0-25%, 2- Anthropogenic land cover proportion strata 26-50%, 3- Anthropogenic land cover proportion strata 51-75%, 4-Anthropogenic land cover proportion strata 76-100%.

[2] Planted grassland use as shorthand for planted herbaceous perennials.

Appendix 3.1 TNC code, common name, scientific name, and Taxonomic Serial Number for breeding birds, mammals, reptiles and amphibians included in the North Dakota Gap Analysis.

TNCCODE	Common name	Scientific name	TSN
AAAAA01140	Tiger Salamander	*Ambystoma tigrinum*	173592
AAAAE01040	Common Mudpuppy	*Necturus maculosus*	173630
AAABB01020	American Toad	*Bufo americanus*	173473
AAABB01050	Great Plains Toad	*Bufo cognatus*	173484
AAABB01080	Canadian Toad	*Bufo hemiophrys*	173487
AAABB01180	Woodhouse's Toad	*Bufo woodhousii*	173476
AAABC02050	Gray Treefrog/Cope's	*Hyla versicolor*	173503
AAABC05073	Boreal Chorus Frog	*Pseudacris triseriata maculata*	207312
AAABF01010	Plains Spadefoot Toad	*Scaphiopus bombifrons*	173428
AAABH01170	Northern Leopard Frog	*Rana pipiens*	173443
AAABH01200	Wood Frog	*Rana sylvatica*	173440
ABNBA01030	Common Loon	*Gavia immer*	174469
ABNCA02010	Pied-Billed Grebe	*Podilymbus podiceps*	174505
ABNCA03010	Horned Grebe	*Podiceps auritus*	174482
ABNCA03020	Red-Necked Grebe	*Podiceps grisegena*	174479
ABNCA03030	Eared Grebe	*Podiceps nigricollis*	174485
ABNCA04010	Western Grebe	*Aechmophorus occidentalis*	174503
ABNFC01010	American White Pelican	*Pelecanus erythrorhynchos*	174684
ABNFD01020	Double-Crested Cormorant	*Phalacrocorax auritus*	174717
ABNGA01020	American Bittern	*Botaurus lentiginosus*	174856
ABNGA02010	Least Bittern	*Ixobrychus exilis*	174846
ABNGA04010	Great Blue Heron	*Ardea herodias*	174773
ABNGA07010	Cattle Egret	*Bubulcus ibis*	174803
ABNGA08010	Green Heron	*Butorides virescens*	174793
ABNGA11010	Black-Crowned Night-Heron	*Nycticorax nycticorax*	174832
ABNJB05030	Canada Goose	*Branta canadensis*	174999
ABNJB09010	Wood Duck	*Aix sponsa*	175122
ABNJB10010	American Green-Winged Teal	*Anas crecca*	175081
ABNJB10040	American Black Duck	*Anas rubripes*	175068
ABNJB10060	Mallard	*Anas platyrhynchos*	175063
ABNJB10110	Northern Pintail	*Anas acuta*	175074
ABNJB10130	Blue-Winged Teal	*Anas discors*	175086
ABNJB10140	Cinnamon Teal	*Anas cyanoptera*	175089
ABNJB10150	Northern Shoveler	*Anas clypeata*	175096
ABNJB10160	Gadwall	*Anas strepera*	175073
ABNJB10180	American Wigeon	*Anas americana*	175094
ABNJB11020	Canvasback	*Aythya valisineria*	175129
ABNJB11030	Redhead	*Aythya americana*	175125
ABNJB11040	Ring-Necked Duck	*Aythya collaris*	175128
ABNJB11070	Lesser Scaup	*Aythya affinis*	175134
ABNJB18010	Common Goldeneye	*Bucephala clangula*	175141
ABNJB18030	Bufflehead	*Bucephala albeola*	175145
ABNJB20010	Hooded Merganser	*Lophodytes cucullatus*	175183

Appendix 3.1 (continued) TNC code, common name, scientific name, and Taxonomic Serial Number for breeding birds, mammals, reptiles and amphibians included in the North Dakota Gap Analysis.

TNCCODE	Common name	Scientific name	TSN
ABNJB22010	Ruddy Duck	*Oxyura jamaicensis*	175175
ABNKA02010	Turkey Vulture	*Cathartes aura*	175265
ABNKC10010	Bald Eagle	*Haliaeetus leucocephalus*	175420
ABNKC11010	Northern Harrier	*Circus cyaneus*	175430
ABNKC12020	Sharp-Shinned Hawk	*Accipiter striatus*	175304
ABNKC12040	Cooper's Hawk	*Accipiter cooperii*	175309
ABNKC19050	Broad-Winged Hawk	*Buteo platypterus*	175365
ABNKC19070	Swainson's Hawk	*Buteo swainsoni*	175367
ABNKC19110	Red-Tailed Hawk	*Buteo jamaicensis*	175350
ABNKC19120	Ferruginous Hawk	*Buteo regalis*	175377
ABNKC22010	Golden Eagle	*Aquila chrysaetos*	175407
ABNKD06020	American Kestrel	*Falco sparverius*	175622
ABNKD06030	Merlin	*Falco columbarius*	175613
ABNKD06090	Prairie Falcon	*Falco mexicanus*	175603
ABNLC11010	Ruffed Grouse	*Bonasa umbellus*	175790
ABNLC12010	Sage Grouse	*Centrocercus urophasianus*	175855
ABNLC13010	Greater Prairie-Chicken	*Tympanuchus cupido*	175834
ABNLC13030	Sharp-Tailed Grouse	*Tympanuchus phasianellus*	175841
ABNLC14010	Wild Turkey	*Meleagris gallopavo*	176136
ABNME01010	Yellow Rail	*Coturnicops noveboracensis*	176259
ABNME05030	Virginia Rail	*Rallus limicola*	176221
ABNME08020	Sora	*Porzana carolina*	176242
ABNME14020	American Coot	*Fulica americana*	176292
ABNNB03070	Piping Plover	*Charadrius melodus*	176507
ABNNB03090	Killdeer	*Charadrius vociferus*	176520
ABNND02010	American Avocet	*Recurvirostra americana*	176721
ABNNF02010	Willet	*Catoptrophorus semipalmatus*	176638
ABNNF04020	Spotted Sandpiper	*Actitis macularia*	176612
ABNNF06010	Upland Sandpiper	*Bartramia longicauda*	176610
ABNNF07070	Long-Billed Curlew	*Numenius americanus*	176593
ABNNF08040	Marbled Godwit	*Limosa fedoa*	176686
ABNNF18010	Common Snipe	*Gallinago gallinago*	176700
ABNNF20010	Wilson's Phalarope	*Phalaropus tricolor*	176736
ABNNM03020	Franklin's Gull	*Larus pipixcan*	176838
ABNNM03100	Ring-Billed Gull	*Larus delawarensis*	176830
ABNNM03110	California Gull	*Larus californicus*	176829
ABNNM08070	Common Tern	*Sterna hirundo*	176888
ABNNM08090	Forster's Tern	*Sterna forsteri*	176887
ABNNM08100	Least Tern	*Sterna antillarum*	176923
ABNNM10020	Black Tern	*Chlidonias niger*	176959
ABNPB04040	Mourning Dove	*Zenaida macroura*	177125
ABNRB02010	Black-Billed Cuckoo	*Coccyzus erythropthalmus*	177834
ABNSB01030	Eastern Screech-Owl	*Otus asio*	177856

Appendix 3.1 (continued) TNC code, common name, scientific name, and Taxonomic Serial Number for breeding birds, mammals, reptiles and amphibians included in the North Dakota Gap Analysis.

TNCCODE	Common name	Scientific name	TSN
ABNSB05010	Great Horned Owl	*Bubo virginianus*	177884
ABNSB10010	Burrowing Owl	*Athene cunicularia*	177946
ABNSB13010	Long-Eared Owl	*Asio otus*	177932
ABNSB13040	Short-Eared Owl	*Asio flammeus*	177935
ABNTA02020	Common Nighthawk	*Chordeiles minor*	177979
ABNTA04010	Common Poorwill	*Phalaenoptilus nuttallii*	177969
ABNUA03010	Chimney Swift	*Chaetura pelagica*	178001
ABNUC45010	Ruby-Throated Hummingbird	*Archilochus colubris*	178032
ABNXD01020	Belted Kingfisher	*Ceryle alcyon*	178119
ABNYF04040	Red-Headed Woodpecker	*Melanerpes erythrocephalus*	178186
ABNYF05010	Yellow-Bellied Sapsucker	*Sphyrapicus varius*	178202
ABNYF07030	Downy Woodpecker	*Picoides pubescens*	178259
ABNYF07040	Hairy Woodpecker	*Picoides villosus*	178262
ABNYF10020	Northern Flicker	*Colaptes auratus*	178154
ABNYF12020	Pileated Woodpecker	*Dryocopus pileatus*	178166
ABPAE32050	Western Wood-Pewee	*Contopus sordidulus*	178360
ABPAE32060	Eastern Wood-Pewee	*Contopus virens*	178359
ABPAE33030	Alder Flycatcher	*Empidonax alnorum*	178340
ABPAE33040	Willow Flycatcher	*Empidonax traillii*	178341
ABPAE33070	Least Flycatcher	*Empidonax minimus*	178344
ABPAE35020	Eastern Phoebe	*Sayornis phoebe*	178329
ABPAE35030	Say's Phoebe	*Sayornis saya*	178333
ABPAE43070	Great Crested Flycatcher	*Myiarchus crinitus*	178309
ABPAE52050	Western Kingbird	*Tyrannus verticalis*	178287
ABPAE52060	Eastern Kingbird	*Tyrannus tyrannus*	178279
ABPAT02010	Horned Lark	*Eremophila alpestris*	178402
ABPAU01010	Purple Martin	*Progne subis*	178464
ABPAU03010	Tree Swallow	*Tachycineta bicolor*	178431
ABPAU07010	Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*	178443
ABPAU08010	Bank Swallow	*Riparia riparia*	178436
ABPAU09010	Cliff Swallow	*Petrochelidon pyrrhonota*	178455
ABPAU09030	Barn Swallow	*Hirundo rustica*	178448
ABPAV02020	Blue Jay	*Cyanocitta cristata*	179680
ABPAV09010	Black-Billed Magpie	*Pica pica*	179720
ABPAV10010	American Crow	*Corvus brachyrhynchos*	179731
ABPAW01010	Black-Capped Chickadee	*Poecile atricapillus*	554382
ABPAZ01010	Red-Breasted Nuthatch	*Sitta canadensis*	178784
ABPAZ01020	White-Breasted Nuthatch	*Sitta carolinensis*	178775
ABPBG03010	Rock Wren	*Salpinctes obsoletus*	178614
ABPBG09010	House Wren	*Troglodytes aedon*	178541
ABPBG10010	Sedge Wren	*Cistothorus platensis*	178605
ABPBG10020	Marsh Wren	*Cistothorus palustris*	178608
ABPBJ15010	Eastern Bluebird	*Sialia sialis*	179801

Appendix 3.1 (continued) TNC code, common name, scientific name and Taxonomic Serial Numbe for breeding birds, mammals, reptiles and amphibians included in the North Dakota Gap Analysis.			
TNCCODE	Common name	Scientific name	TSN
ABPBJ15030	Mountain Bluebird	*Sialia currucoides*	179811
ABPBJ18080	Veery	*Catharus fuscescens*	179796
ABPBJ20170	American Robin	*Turdus migratorius*	179759
ABPBK01010	Gray Catbird	*Dumetella carolinensis*	178625
ABPBK03010	Northern Mockingbird	*Mimus polyglottos*	178620
ABPBK06010	Brown Thrasher	*Toxostoma rufum*	178627
ABPBM02060	Sprague's Pipit	*Anthus spragueii*	178499
ABPBN01020	Cedar Waxwing	*Bombycilla cedrorum*	178532
ABPBR01030	Loggerhead Shrike	*Lanius ludovicianus*	178515
ABPBW01110	Bell's Vireo	*Vireo bellii*	179003
ABPBW01170	Yellow-Throated Vireo	*Vireo flavifrons*	179009
ABPBW01210	Warbling Vireo	*Vireo gilvus*	179023
ABPBW01230	Philadelphia Vireo	*Vireo philadelphicus*	179022
ABPBW01240	Red-Eyed Vireo	*Vireo olivaceus*	179021
ABPBX01050	Orange-Crowned Warbler	*Vermivora celata*	178856
ABPBX01060	Nashville Warbler	*Vermivora ruficapilla*	178861
ABPBX03010	Yellow Warbler	*Dendroica petechia*	178878
ABPBX03020	Chestnut-Sided Warbler	*Dendroica pensylvanica*	178911
ABPBX05010	Black-And-White Warbler	*Mniotilta varia*	178844
ABPBX06010	American Redstart	*Setophaga ruticilla*	178979
ABPBX10010	Ovenbird	*Seiurus aurocapillus*	178927
ABPBX10020	Northern Waterthrush	*Seiurus noveboracensis*	178931
ABPBX11030	Mourning Warbler	*Oporornis philadelphia*	178939
ABPBX12010	Common Yellowthroat	*Geothlypis trichas*	178944
ABPBX24010	Yellow-Breasted Chat	*Icteria virens*	178964
ABPBX45040	Scarlet Tanager	*Piranga olivacea*	179883
ABPBX61030	Rose-Breasted Grosbeak	*Pheucticus ludovicianus*	179139
ABPBX61040	Black-Headed Grosbeak	*Pheucticus melanocephalus*	179140
ABPBX63010	Blue Grosbeak	*Guiraca caerulea*	179145
ABPBX64020	Lazuli Bunting	*Passerina amoena*	179151
ABPBX64030	Indigo Bunting	*Passerina cyanea*	179150
ABPBX65010	Dickcissel	*Spiza americana*	179165
ABPBX74030	Eastern Towhee	*Pipilo erythrophthalmus*	179276
ABPBX74080	Spotted Towhee	*Pipilo maculatus*	554380
ABPBX94020	Chipping Sparrow	*Spizella passerina*	179435
ABPBX94030	Clay-Colored Sparrow	*Spizella pallida*	179439
ABPBX94040	Brewer's Sparrow	*Spizella breweri*	179440
ABPBX94050	Field Sparrow	*Spizella pusilla*	179443
ABPBX95010	Vesper Sparrow	*Pooecetes gramineus*	179366
ABPBX96010	Lark Sparrow	*Chondestes grammacus*	179371
ABPBX98010	Lark Bunting	*Calamospiza melanocorys*	179312
ABPBX99010	Savannah Sparrow	*Passerculus sandwichensis*	179314
ABPBXA0010	Baird's Sparrow	*Ammodramus bairdii*	179339

Appendix 3.1 (continued) TNC code, common name, scientific name and Taxonomic Serial Number for breeding birds, mammals, reptiles and amphibians included in the North Dakota Gap Analysis.

TNCCODE	Common name	Scientific name	TSN
ABPBXA0020	Grasshopper Sparrow	*Ammodramus savannarum*	179333
ABPBXA0040	Le Conte's Sparrow	*Ammodramus leconteii*	179345
ABPBXA0070	Nelson's Sharp-Tailed Sparrow	*Ammodramus nelsoni*	554031
ABPBXA3010	Song Sparrow	*Melospiza melodia*	179492
ABPBXA3030	Swamp Sparrow	*Melospiza georgiana*	179488
ABPBXA4020	White-Throated Sparrow	*Zonotrichia albicollis*	179462
ABPBXA6010	Mccown's Longspur	*Calcarius mccownii*	179525
ABPBXA6040	Chestnut-Collared Longspur	*Calcarius ornatus*	179530
ABPBXA9010	Bobolink	*Dolichonyx oryzivorus*	179032
ABPBXB0010	Red-Winged Blackbird	*Agelaius phoeniceus*	179045
ABPBXB2030	Western Meadowlark	*Sturnella neglecta*	179039
ABPBXB3010	Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*	179043
ABPBXB5020	Brewer's Blackbird	*Euphagus cyanocephalus*	179094
ABPBXB6070	Common Grackle	*Quiscalus quiscula*	179104
ABPBXB7030	Brown-Headed Cowbird	*Molothrus ater*	179112
ABPBXB9070	Orchard Oriole	*Icterus spurius*	179064
ABPBXB9190	Baltimore Oriole	*Icterus galbula*	179083
ABPBXB9220	Bullock's Oriole	*Icterus bullockii*	554267
ABPBY04020	Purple Finch	*Carpodacus purpureus*	179186
ABPBY04040	House Finch	*Carpodacus mexicanus*	179191
ABPBY05010	Red Crossbill	*Loxia curvirostra*	179259
ABPBY06030	Pine Siskin	*Carduelis pinus*	179233
ABPBY06110	American Goldfinch	*Carduelis tristis*	179236
AMAAA01010	Virginia Opossum	*Didelphis virginiana*	179921
AMABA01190	Arctic Shrew	*Sorex arcticus*	179935
AMABA01250	Pigmy Shrew	*Microsorex hoyi*	179959
AMABA01280	Hayden's Shrew	*Sorex haydenii*	179945
AMABA03010	Northern Short-tailed Shrew	*Blarina brevicauda*	179967
AMACC01010	Little Brown Bat	*Myotis lucifugus*	179988
AMACC01060	Keen's Myotis	*Myotis keenii*	179989
AMACC01070	Long-eared Myotis	*Myotis evotis*	179995
AMACC01110	Long-legged Myotis	*Myotis volans*	179990
AMACC01140	Small-footed Myotis	*Myotis leibii*	179999
AMACC02010	Silver-haired Bat	*Lasionycteris noctivagans*	180014
AMACC04010	Big Brown Bat	*Eptesicus fuscus*	180008
AMACC05010	Eastern Red Bat	*Lasiurus borealis*	180016
AMACC05030	Hoary Bat	*Lasiurus cinereus*	180017
AMAEB01040	Eastern Cottontail	*Sylvilagus floridanus*	180124
AMAEB01060	Nuttall's Cottontail	*Sylvilagus nuttallii*	180126
AMAEB01070	Desert Cottontail	*Sylvilagus audubonii*	180122
AMAEB03010	Snowshoe Hare	*Lepus americanus*	180112
AMAEB03040	White-tailed Jackrabbit	*Lepus townsendii*	180118
AMAFB02020	Least Chipmunk	*Eutamius minimus*	180195

Appendix 3.1 (continued) TNC code, common name, scientific name and Taxonomic Serial Number for breeding birds, mammals, reptiles and amphibians included in the North Dakota Gap Analysis.			
TNCCODE	Common name	Scientific name	TSN
AMAFB02230	Eastern Chipmunk	*Tamias striatus*	180207
AMAFB03010	Woodchuck	*Marmota monax*	180137
AMAFB05040	Richardson's Ground Squirrel	*Spermophilus richardsonii*	180157
AMAFB05090	Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	180162
AMAFB05120	Franklin's Ground Squirrel	*Spermophilus franklinii*	180153
AMAFB06010	Black-tailed Prairie Dog	*Cynomys ludovicianus*	180186
AMAFB07010	Gray Squirrel	*Sciurus carolinensis*	180175
AMAFB07040	Eastern Fox Squirrel	*Sciurus niger*	180172
AMAFB08010	Red Squirrel	*Tamiasciurus hudsonicus*	180166
AMAFB09020	Northern Flying Squirrel	*Glaucomys sabrinus*	180169
AMAFC01040	Northern Pocket Gopher	*Thomomys talpoides*	180228
AMAFC02010	Plains Pocket Gopher	*Geomys bursarius*	180216
AMAFD01010	Olive-backed Pocket Mouse	*Perognathus fasciatus*	180260
AMAFD01020	Plains Pocket Mouse	*Perognathus flavescens*	180261
AMAFD03010	Ord's Kangaroo Rat	*Dipodomys ordii*	180244
AMAFD05050	Hispid Pocket Mouse	*Perognathus hispidus*	180264
AMAFE01010	American Beaver	*Castor canadensis*	180212
AMAFF02010	Plains Harvest Mouse	*Reithrodontomys montanus*	180344
AMAFF02030	Western Harvest Mouse	*Reithrodontomys megalotis*	180343
AMAFF03040	Deer Mouse	*Peromyscus maniculatus*	180276
AMAFF03070	White-footed Mouse	*Peromyscus leucopus*	180278
AMAFF06010	Northern Grasshopper Mouse	*Onychomys leucogaster*	180382
AMAFF08090	Bushy-tailed Woodrat	*Neotoma cinerea*	180371
AMAFF09020	Southern Red-backed Vole	*Clethrionomys gapperi*	180294
AMAFF11010	Meadow Vole	*Microtus pennsylvanicus*	180297
AMAFF11140	Prairie Vole	*Microtus ochrogaster*	180312
AMAFF13010	Sagebrush Vole	*Lagurus curtatus*	180355
AMAFF15010	Muskrat	*Ondatra zibethicus*	180318
AMAFH01010	Meadow Jumping Mouse	*Zapus hudsonius*	180386
AMAFH01020	Western Jumping Mouse	*Zapus princeps*	180387
AMAFJ01010	Common Porcupine	*Erethizon dorsatum*	180393
AMAJA01010	Coyote	*Canis latrans*	180599
AMAJA03010	Red Fox	*Vulpes vulpes*	180604
AMAJA04010	Common Gray Fox	*Urocyon cineroargenteus*	180609
AMAJE02010	Common Raccoon	*Procyon lotor*	180575
AMAJF01020	Fisher	*Martes pennanti*	180560
AMAJF02010	Ermine	*Mustela erminea*	180555
AMAJF02020	Least Weasel	*Mustela nivalis*	180554
AMAJF02030	Long-tailed Weasel	*Mustela frenata*	180556
AMAJF02050	Mink	*Mustela vison*	180553
AMAJF04010	American Badger	*Taxidea taxus*	180565
AMAJF05010	Eastern Spotted Skunk	*Spilogale putorius*	180570
AMAJF06010	Striped Skunk	*Mephitis mephitis*	180562

Appendix 3.1 (continued) TNC code, common name, scientific name and Taxonomic Serial Number for breeding birds, mammals, reptiles and amphibians included in the North Dakota Gap Analysis.

TNCCODE	Common name	Scientific name	TSN
AMAJF08010	River Otter	*Lutra canadensis*	180549
AMAJH03020	Bobcat	*Felis rufus*	203547
AMALC01010	Elk	*Cervus elaphus*	180695
AMALC02010	Mule Deer	*Odocoileus hemionus*	180698
AMALC02020	White-tailed Deer	*Odocoileus virginianus*	180699
AMALC03010	Moose	*Alces alces*	180703
AMALD01010	Pronghorn	*Antilocapridae americana*	180717
AMALE04010	Bighorn Sheep	*Ovis canadensis*	180711
ARAAB01012	Common Snapping Turtle	*Chelydra serpentina*	173752
ARAAD01011	Western Painted Turtle	*Chrysemys picta belli*	208620
ARAAD05082	False Map Turtle	*Graptemys pseudogeographica*	173800
ARAAG01022	Midland Smooth Softshell Turtle	*Apalone mutica*	208677
ARACF12032	Eastern Short Horned Lizard	*Phrynosoma douglassi brevirostre*	564567
ARACF14032	Northern Sagebrush Lizard	*Sceloporus graciosus graciosus*	208742
ARACH01102	Northern Prairie Skink	*Eumeces septentrionalis*	173969
ARADB07014	Eastern Yellowbelly Racer	*Coluber constrictor flaviventris*	209193
ARADB17010	Western Hognose Snake	*Heterodon nasicus*	174155
ARADB23020	Smooth Green Snake	*Opheodrys vernalis*	174173
ARADB2601A	Bullsnake	*Pituophis melanoleucus sayi*	209409
ARADB34032	Northern Red-bellied Snake	*Storeria occipitomaculata*	174131
ARADB36100	Plains Garter Snake	*Thamnophis radix*	174147
ARADB36130	Red-sided Garter Snake	*Thamnophis sirtalis parietalis*	209099
ARADE02128	Prairie Rattlesnake	*Crotalus viridis viridis*	209549

Appendix 3.2 Data sources for vertebrate species location records

Breeding Birds – Total Records 188,000+

Bird Banding Lab (24 April to 21 July banding data only)
Breeding Bird Survey, U. S. Geological Survey
Bureau of Reclamation
North Dakota Game and Fish Department, Sage Grouse Surveys
North Dakota Game and Fish Department, Sharp-tailed Grouse Surveys
North Dakota Game and Fish Department, Roadside Surveys
North Dakota Public Service Commission
University of Kansas Natural History Museum
North Dakota Natural Heritage Inventory
Smithsonian Natural History Museum
Museum of Texas Tech University
University of North Dakota
U.S. Fish and Wildlife Service
U.S. Geological Survey, Northern Prairie Wildlife Research Center
U.S. Army Corps of Engineers

Herptiles - Total Records 3,891

All extant locational data for North Dakota were compiled by Jeff Jundt, North American Reporting Center for Amphibian Malformations, as part of his MS thesis at North Dakota State University. Data came from North Dakota Game and Fish Department, University of North Dakota, North Dakota State University, Minot State University, U.S. Geological Survey, Northern Prairie Wildlife Research Center, North Dakota Natural Heritage Inventory, Wheeler and Wheeler (1963), and Woodworth Station.

Mammals – Total Records 8,600+

Bureau of Reclamation
North Dakota Public Service Commission
University of North Dakota
North Dakota State University
Bob Seabloom personal collection (University of North Dakota)
Smithsonian Natural History Museum
Museum of Texas Tech University
University of Kansas Natural History Museum
The Sam Noble Oklahoma Museum of Natural History, University of Oklahoma
North Dakota Game and Fish Department, Predator and other mammal surveys
North Dakota Game and Fish Department, Elk and Moose records
North Dakota Game and Fish Department, Hunting records for other game mammals
North Dakota Natural Heritage Inventory
U.S. Geological Survey, Northern Prairie Wildlife Research Center

Appendix 3.3 Names and affiliation of experts who reviewed vertebrate species range maps and species habitat affinities.

Name	Affliation	Reviewed
Ted Hoberg	Twining School, Grand Forks Air Base	reptiles, amphibians
Lawrence Igl	U.S. Geological Survey, NPWRC	birds
Bill Jensen	North Dakota Game and Fish Department	mammals
Jacqui Jerrads	North Dakota Game and Fish Department	mammals
Jeff Jundt	U.S. Geological Survey, NPWRC	reptiles, amphibians
Glennis Kaufman	Kansas State University	mammals
Ron Martin	North Dakota Birding Society	birds
Robert Seabloom	University of North Dakota (retired)	mammals
Marsha Sovada	U.S. Geological Survey, NPWRC	mammals
Dan Svingen	U.S. Forest Service	birds
Doug Backlund	South Dakota Department of Game, Fish and Parks	mammals, reptiles, amphibians
Eileen Dowd-Stukel	South Dakota Department of Game, Fish and Parks	mammals
Tate Fischer	United States Fish and Wildlife Service	amphibians
Bob Hodorff	United States Forest Service	mammals
Lynn Hetlet	United States Forest Service	mammals
Lenny McDaniel	United States Fish and Wildlife Service	mammals
Tim Mullican	Dakota Wesleyan University	mammals
David Naugle	University of Wisconsin, Stevens Point	birds
Jeff Palmer	Dakota State University	birds
George Rinker	University of South Dakota, retired	mammals
Dennis Skadsen	Natural History Investigations	mammals
Brian Smith	Black Hills State University	reptiles
Dan Tallman	Northern State University	birds
Steve Thompson	South Dakota Deptment of Game, Fish and Parks	reptiles, amphibians
Joel Tigner	Batworks	mammals
Paul Bartelt	Waldorf College	herptiles
Neil Bernstein	Mount Mercy College	herptiles
John Bowles	Central College (retired)	mammals
James Christiansen	Drake University	herptiles
Brent Danielson	Iowa State University	mammals
Jim Dinsmore	Iowa State University (retired)	birds
Curtis Eckerman	Iowa State Univeristy	herptiles
Bruce Ehresman	Iowa Department of Natural Resources	birds, mammals, herptiles
Eugenia Farrar	Iowa State University	herptiles
Jane Hey	Morningside College	herptiles
Daryl Howell	Iowa Department of Natural Resources	mammals
Rolf Koford	Iowa State University	birds
Richard Lampe	Buena Vista University	mammals
Jeff LeClere	Minnesota Department of Natural Resources	herptiles
Pat Schlarbaum	Iowa Department of Natural Resources	mammals
Jim Stroh	Morningside College	mammals
Howard Whidden	Augustana College	mammals

Appendix 3.4. Accuracy Assessment Tables for Bird Species.

Scientific_name	Arrowwood NWR	Long Lake NWR	Lostwood NWR	Tewaukon NWR	Theodore Roosevelt NP
Gavia immer	A	A	A	A	A
Podilymbus podiceps	A	A	A	A	C
Podiceps auritus	A	A	A	A	A
Podiceps grisegena	A	A	A	A	A
Podiceps nigricollis	A	A	A	A	C
Aechmophorus occidentalis	A	A	A	A	C
Pelecanus erythrorhynchos	A	A	A	A	A
Phalacrocorax auritus	A	A	A	A	C
Botaurus lentiginosus	A	A	A	A	C
Ixobrychus exilis	A	A	A	A	A
Ardea herodias	A	A	A	A	A
Bubulcus ibis	A	A	A	A	A
Butorides virescens	A	A	A	A	A
Nycticorax nycticorax	A	A	A	A	A
Branta canadensis	A	A	A	A	A
Aix sponsa	A	A	A	A	C
Anas crecca	A	A	A	A	A
Anas rubripes	A	A	A	A	A
Anas platyrhynchos	A	A	A	A	A
Anas acuta	A	A	A	A	A
Anas discors	A	A	A	A	A
Anas cyanoptera	A	A	A	C	A
Anas clypeata	A	A	A	A	C
Anas strepera	A	A	A	A	A
Anas americana	A	A	A	A	A
Aythya valisineria	A	A	A	A	A
Aythya americana	A	A	A	A	C
Aythya collaris	A	A	A	A	A
Aythya affinis	A	A	A	A	C
Bucephala clangula	A	A	A	A	O
Bucephala albeola	A	A	A	A	A
Lophodytes cucullatus	A	A	A	A	A
Oxyura jamaicensis	A	A	A	A	C
Cathartes aura	A	A	A	A	A
Haliaeetus leucocephalus	A	C	A	A	A
Circus cyaneus	A	C	A	A	A
Accipiter striatus	A	A	A	A	A
Accipiter cooperii	A	A	A	A	A
Buteo platypterus	C	A	A	A	A
Buteo swainsoni	A	A	A	A	A
Buteo jamaicensis	A	A	A	A	A
Buteo regalis	A	A	A	A	A
Aquila chrysaetos	A	C	C	A	A
Falco sparverius	A	A	A	A	A
Falco columbarius	A	A	A	A	A
Falco mexicanus	A	A	A	A	A
Bonasa umbellus	A	A	A	A	C

Appendix 3.4 (continued). Accuracy Assessment Tables for Bird Species.					
Scientific_name	Arrowwood NWR	Long Lake NWR	Lostwood NWR	Tewaukon NWR	Theodore Roosevelt NP
Centrocercus urophasianus	A	A	A	A	A
Tympanuchus cupido	A	A	A	A	A
Tympanuchus phasianellus	A	A	A	A	A
Meleagris gallopavo	A	A	A	A	A
Coturnicops noveboracensis	A	A	A	A	A
Rallus limicola	A	A	A	A	C
Porzana carolina	A	A	A	A	A
Fulica americana	A	A	A	A	C
Charadrius melodus	A	A	A	A	A
Charadrius vociferus	A	A	A	A	A
Recurvirostra americana	A	A	A	A	C
Catoptrophorus semipalmatus	A	A	A	A	C
Actitis macularia	A	A	A	A	C
Bartramia longicauda	A	A	A	A	A
Numenius americanus	A	A	A	A	A
Limosa fedoa	A	A	A	A	C
Gallinago gallinago	A	A	A	A	C
Phalaropus tricolor	A	A	A	A	C
Larus pipixcan	A	A	A	A	A
Larus delawarensis	A	C	A	A	A
Larus californicus	A	A	A	A	A
Sterna hirundo	A	A	A	A	A
Sterna forsteri	A	A	A	A	A
Sterna antillarum	A	A	A	A	A
Chlidonias niger	A	A	A	A	A
Zenaida macroura	A	A	A	A	A
Coccyzus erythropthalmus	A	A	A	A	A
Otus asio	A	A	A	A	A
Bubo virginianus	A	A	A	A	A
Athene cunicularia	A	A	A	C	A
Asio otus	A	A	A	A	A
Asio flammeus	A	A	A	A	A
Chordeiles minor	A	A	A	A	A
Phalaenoptilus nuttallii	A	A	A	A	A
Chaetura pelagica	A	A	A	A	C
Archilochus colubris	A	O	A	A	A
Ceryle alcyon	A	A	A	A	A
Melanerpes erythrocephalus	A	A	A	A	A
Sphyrapicus varius	A	A	A	A	A
Picoides pubescens	A	A	A	A	A
Picoides villosus	A	A	A	A	A
Colaptes auratus	A	A	A	A	A
Dryocopus pileatus	A	A	A	A	A
Contopus sordidulus	A	A	A	A	A
Contopus virens	A	A	A	A	A
Empidonax alnorum	A	A	A	A	A
Empidonax traillii	A	A	A	A	A

Appendix 3.4 (continued). Accuracy Assessment Tables for Bird Species.					
Scientific_name	Arrowwood NWR	Long Lake NWR	Lostwood NWR	Tewaukon NWR	Theodore Roosevelt NP
Empidonax minimus	A	A	A	A	A
Sayornis phoebe	A	A	A	A	A
Sayornis saya	A	A	A	A	A
Myiarchus crinitus	A	C	A	A	A
Tyrannus verticalis	A	A	A	A	A
Tyrannus tyrannus	A	A	A	A	A
Eremophila alpestris	C	A	A	A	A
Progne subis	A	O	A	A	A
Tachycineta bicolor	A	A	A	A	A
Stelgidopteryx serripennis	A	A	A	A	A
Riparia riparia	A	A	A	A	A
Petrochelidon pyrrhonota	A	A	A	A	A
Hirundo rustica	A	A	A	A	A
Cyanocitta cristata	A	A	C	A	A
Pica pica	A	A	A	A	A
Corvus brachyrhynchos	A	A	A	A	A
Poecile atricapillus	A	A	A	A	A
Sitta canadensis	A	A	A	A	A
Sitta carolinensis	A	A	A	A	A
Salpinctes obsoletus	A	A	A	A	A
Troglodytes aedon	A	A	A	A	A
Cistothorus platensis	A	A	A	A	A
Cistothorus palustris	A	A	A	A	A
Sialia sialis	A	A	A	A	A
Sialia currucoides	A	A	A	A	A
Catharus fuscescens	A	A	A	A	A
Turdus migratorius	A	A	A	A	A
Dumetella carolinensis	A	A	A	A	A
Mimus polyglottos	A	A	A	A	C
Toxostoma rufum	A	A	A	A	A
Anthus spragueii	A	A	A	A	A
Bombycilla cedrorum	A	A	A	A	A
Lanius ludovicianus	A	A	A	A	A
Vireo bellii	A	A	A	A	A
Vireo flavifrons	A	A	A	A	A
Vireo gilvus	A	A	A	A	A
Vireo philadelphicus	A	A	A	A	A
Vireo olivaceus	A	A	A	A	A
Vermivora celata	A	A	A	A	A
Vermivora ruficapilla	A	A	A	A	A
Dendroica petechia	A	A	A	A	A
Dendroica pensylvanica	A	A	A	A	A
Mniotilta varia	A	A	A	A	A
Setophaga ruticilla	A	A	A	A	A
Seiurus aurocapillus	A	A	A	A	A
Seiurus noveboracensis	A	A	A	A	A

Appendix 3.4 (continued). Accuracy Assessment Tables for Bird Species.

Scientific_name	Arrowwood NWR	Long Lake NWR	Lostwood NWR	Tewaukon NWR	Theodore Roosevelt NP
Oporornis philadelphia	A	A	A	A	A
Geothlypis trichas	A	A	A	A	A
Icteria virens	A	C	A	A	A
Piranga olivacea	A	C	A	A	A
Pheucticus ludovicianus	C	A	A	A	O
Pheucticus melanocephalus	A	A	A	A	A
Guiraca caerulea	A	A	A	A	A
Passerina amoena	A	C	A	A	A
Passerina cyanea	A	C	A	A	A
Spiza americana	C	A	A	A	C
Pipilo erythrophthalmus	A	A	A	A	A
Pipilo maculatus	A	C	A	A	A
Spizella passerina	A	A	A	C	A
Spizella pallida	A	A	A	A	A
Spizella breweri	A	A	A	A	A
Spizella pusilla	A	C	C	A	A
Pooecetes gramineus	C	A	A	A	A
Chondestes grammacus	A	A	A	A	A
Calamospiza melanocorys	A	A	A	A	A
Passerculus sandwichensis	A	A	A	A	A
Ammodramus bairdii	A	A	A	A	A
Ammodramus savannarum	A	A	A	A	A
Ammodramus leconteii	A	A	A	A	C
Ammodramus nelsoni	A	A	A	A	A
Melospiza melodia	A	A	A	A	A
Melospiza georgiana	A	A	A	A	A
Zonotrichia albicollis	A	A	A	A	A
Calcarius mccownii	A	A	A	A	O
Calcarius ornatus	A	A	A	A	A
Dolichonyx oryzivorus	A	A	A	A	A
Agelaius phoeniceus	A	A	A	A	A
Sturnella neglecta	A	A	A	A	A
Xanthocephalus xanthocephalus	A	A	A	A	A
Euphagus cyanocephalus	A	A	A	A	A
Quiscalus quiscula	A	A	A	A	A
Molothrus ater	A	A	A	A	A
Icterus spurius	A	A	A	A	A
Icterus galbula	A	A	A	A	C
Icterus bullockii	A	A	A	A	C
Carpodacus purpureus	A	A	A	A	A
Carpodacus mexicanus	A	A	A	A	C
Loxia curvirostra	A	A	A	A	C
Carduelis pinus	A	A	A	A	A
Carduelis tristis	A	A	A	A	A
Agreement	179	171	181	181	154
Commission	5	11	3	3	27
Omission	0	2	0	0	3

Appendix 3.5. Accuracy Assessment Table for Mammal Species					
TNCcode	Common name	Scientific name	Lostwood NWR	Tewaukon NWR	Cross Ranch Nature Preserve
AMAAA01010	Virginia Opossum	*Didelphis virginiana*	A	A	A
AMABA01190	Arctic Shrew	*Sorex arcticus*	A	C	A
AMABA01250	Pigmy Shrew	*Microsorex hoyi*	A	A	A
AMABA01280	Hayden's Shrew	*Sorex haydenii*	A	A	A
AMABA03010	Northern Short-tailed Shrew	*Blarina brevicauda*	A	A	C
AMACC01010	Little Brown Bat	*Myotis lucifugus*	A	A	A
AMACC01060	Keen's Myotis	*Myotis keenii*	A	C	C
AMACC01070	Long-eared Myotis	*Myotis evotis*	A	A	A
AMACC01110	Long-legged Myotis	*Myotis volans*	A	A	A
AMACC01140	Small-footed Myotis	*Myotis leibii*	A	A	A
AMACC02010	Silver-haired Bat	*Lasionycteris noctivagans*	A	A	A
AMACC04010	Big Brown Bat	*Eptesicus fuscus*	A	C	A
AMACC05010	Eastern Red Bat	*Lasiurus borealis*	A	A	A
AMACC05030	Hoary Bat	*Lasiurus cinereus*	A	A	A
AMAEB01040	Eastern Cottontail	*Sylvilagus floridanus*	A	A	A
AMAEB01060	Nuttall's Cottontail	*Sylvilagus nuttallii*	A	A	A
AMAEB01070	Desert Cottontail	*Sylvilagus audubonii*	A	A	A
AMAEB03010	Snowshoe Hare	*Lepus americanus*	A	A	C
AMAEB03040	White-tailed Jack Rabbit	*Lepus townsendii*	A	A	A
AMAFB02020	Least Chipmunk	*Eutamius minimus*	A	A	A
AMAFB02230	Eastern Chipmunk	*Tamias striatus*	A	C	A
AMAFB03010	Woodchuck	*Marmota monax*	A	A	A
AMAFB05040	Richardson's Ground Squirrel	*Spermophilus richardsonii*	A	A	A
AMAFB05090	Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	A	A	A
AMAFB05120	Franklin's Ground Squirrel	*Spermophilus franklinii*	A	A	A
AMAFB06010	Black-tailed Prairie Dog	*Cynomys ludovicianus*	A	A	C
AMAFB07010	Gray Squirrel	*Sciurus carolinensis*	A	C	A
AMAFB07040	Eastern Fox Squirrel	*Sciurus niger*	A	A	A
AMAFB08010	Red Squirrel	*Tamiasciurus hudsonicus*	A	A	A
AMAFB09020	Northern Flying Squirrel	*Glaucomys sabrinus*	A	C	A
AMAFC01040	Northern Pocket Gopher	*Thomomys talpoides*	C	A	A
AMAFC02010	Plains Pocket Gopher	*Geomy bursarius*	A	A	A
AMAFD01010	Olived-backed Pocket Mouse	*Perognathus fasciatus*	A	C	A
AMAFD01020	Plains Pocket Mouse	*Perognathus flavescens*	C	A	O
AMAFD03010	Ord's Kangaroo Rat	*Dipodomys ordii*	A	A	A
AMAFD05050	Hispid Pocket Mouse	*Perognathus hispidus*	A	A	A
AMAFE01010	American Beaver	*Castor Canadensis*	A	A	A
AMAFF02010	Plains Harvest Mouse	*Reithrodontomys montanus*	A	C	C
AMAFF02030	Western Harvest Mouse	*Reithrodontomys megalotis*	A	A	A
AMAFF03040	Deer Mouse	*Peromyscus maniculatus*	A	A	A
AMAFF03070	White-footed Mouse	*Peromyscus leucopus*	A	A	A
AMAFF06010	Northern Grasshopper Mouse	*Onychomys leucogaster*	A	A	A
AMAFF08090	Bushy-tailed Woodrat	*Neotoma cinerea*	A	A	O
AMAFF09020	Southern Red-backed Vole	*Clethrionomys gapperi*	A	A	A
AMAFF11010	Meadow Vole	*Microtus pennsylvanicus*	A	A	A

Appendix 3.5 (continued). Accuracy Assessment Table for Mammal Species

TNCcode	Common name	Scientific name	Lostwood NWR	Tewaukon NWR	Cross Ranch Nature Preserve
AMAFF11140	Prairie Vole	*Microtus ochrogaster*	A	C	A
AMAFF13010	Sagebrush Vole	*Lagurus curtatus*	A	A	A
AMAFF15010	Muskrat	*Ondatra zibethicus*	A	A	A
AMAFH01010	Meadow Jumping Mouse	*Zapus hudsonius*	A	A	A
AMAFH01020	Western Jumping Mouse	*Zapus princeps*	A	A	A
AMAFJ01010	Common Porcupine	*Erethizon dorsatum*	A	A	A
AMAJA01010	Coyote	*Canis Latrans*	A	A	A
AMAJA03010	Red Fox	*Vulpes vulpes*	A	A	A
AMAJA04010	Common Gray Fox	*Urocyon cineroargenteus*	A	A	A
AMAJE02010	Common Raccoon	*Procyon lotor*	A	A	A
AMAJF01020	Fisher	*Martes pennanti*	A	A	A
AMAJF02010	Ermine	*Mustela erminea*	O	A	A
AMAJF02020	Least Weasel	*Mustela nivalis*	A	A	A
AMAJF02030	Long-tailed Weasel	*Mustela frenata*	A	A	A
AMAJF02050	Mink	*Mustela vison*	A	A	A
AMAJF04010	American Badger	*Taxidea taxus*	A	A	A
AMAJF05010	Eastern Spotted Skunk	*Spilogale putorius*	A	A	A
AMAJF06010	Striped Skunk	*Mephitis mephitis*	A	A	A
AMAJF08010	River Otter	*Lutra canadensis*	A	A	A
AMAJH03020	Bobcat	*Felis rufus*	A	C	A
AMALC01010	Elk	*Cervus elaphus*	A	A	A
AMALC02010	Mule Deer	*Odocoileus hemionus*	A	A	A
AMALC02020	White-tailed Deer	*Odocoileus virginianus*	A	A	A
AMALC03010	Moose	*Alces Alces*	A	A	A
AMALD01010	Pronghorn	*Antilocapridae americana*	O	A	A
AMALE04010	Bighorn Sheep	*Ovis Canadensis*	A	A	C
Agreement			67	61	63
Commission			2	10	6
Ommission			2	0	2

Appendix 3.6. Accuracy Assessment Table for Amphibian Species

TNCcode	Common name	Scientific name	Lostwood NWR	Tewaukon NWR	Theodore Roosevelt NP
AAAAA01140	Tiger Salamander	*Ambystoma tigrinum*	A	A	A
AAAAE01040	Common Mudpuppy	*Necturus maculosus*	A	A	A
AAABB01020	American Toad	*Bufo americanus*	A	A	A
AAABB01050	Great Plains Toad	*Bufo cognatus*	A	A	A
AAABB01080	Canadian Toad	*Bufo hemiophrys*	C	A	C
AAABB01184	Woodhouse's Toad	*Bufo w. woodhousii*	A	A	A
AAABC02050	Gray Treefrog/Cope's	*Hyla versicolor/chrysoscelis*	A	A	A
AAABC05073	Boreal Chorus Frog	*Pseudacris triseriata maculata*	A	A	A
AAABF01010	Plains Spadefoot Toad	*Scaphiopus bombifrons*	A	A	O
AAABH01170	Northern Leopard Frog	*Rana pipiens*	A	A	A
AAABH01200	Wood Frog	*Rana sylvatica*	A	A	C
Agreement			10	11	8
Commission			1	0	2
Omission			0	0	1

Appendix 3.7. Accuracy Assessment Table for Reptile Species

TNCcode	Common name	Scientific name	Lostwood NWR	Tewaukon NWR	Theodore Roosevelt NP
ARAAB01012	Common Snapping Turtle	*Chelydra s. serpentina*	C	A	A
ARAAD01011	Western Painted Turtle	*Chrysemys picta belli*	A	A	A
ARAAD05082	False Map Turtle	*Graptemys p. pseudogeographica*	A	A	A
ARAAG01022	Midland Smooth Softshell Turtle	*Apalone m. mutica*	A	A	O
ARACF12032	Eastern Short Horned Lizard	*Phrynosoma douglassi brevirostre*	A	A	A
ARACF14032	Northern Sagebrush L	*Sceloporus g. graciosus*	A	A	A
ARACH01102	Northern Prairie Skink	*Eumeces septentrionalis*	A	A	A
ARADB07014	Eastern Yellowbelly Racer	*Coluber constrictor flaviventris*	A	A	A
ARADB17010	Western Hognose Snake	*Heterodon nasicus*	A	A	A
ARADB23020	Smooth Green Snake	*Opheodrys vernalis*	A	A	A
ARADB2601A	Bullsnake	*Pituophis melanoleucus sayi*	A	A	A
ARADB34032	Northern Redbelly Snake	*Storeria o. occipitomaculata*	A	A	A
ARADB36100	Plains Garter Snake	*Thamnophis radix*	A	A	A
ARADB36130	Red Sided Garter Snake	*Thamnophis sirtalis parietalis*	A	A	A
ARADE02128	Prairie Rattlesnake	*Crotalus v. viridis*	A	A	A
Agreement			14	15	14
Commission			1	0	0
Omission			0	0	1

Appendix 5.1 Area and percent of terrestrial vertebrate species distributions by four stewardship status categories.

Tnccode	Common name	Scientific name	status1		status2		status3		status4		total ha	% in status 1 and 2
			ha	%	ha	%	ha	%	ha	%		
AAAAA01140	Tiger Salamander	*Ambystoma tigrinum*	15460	0.7	59109	2.5	197920	8.3	2105600	88.5	2378089	3.1
AAAAE01040	Common Mudpuppy	*Necturus maculosus*	13	0.2	23	0.4	159	2.4	6358	97	6553	0.6
AAABB01020	American Toad	*Bufo americanus*	661	0.1	14895	1.2	20225	1.6	1205700	97.1	1241481	1.3
AAABB01050	Great Plains Toad	*Bufo cognatus*	29016	0.4	111210	1.5	509220	6.8	6849100	91.3	7498546	1.9
AAABB01080	Canadian Toad	*Bufo hemiophrys*	442	0.1	20234	2.5	30318	3.7	773190	93.8	824184	2.5
AAABB01180	Woodhouse's Toad	*Bufo woodhousii*	27960	0.4	94919	1.4	480040	7.1	6144700	91.1	6747619	1.8
AAABC02050	Gray Treefrog/Cope's	*Hyla versicolor*	467	0.2	7890	3.1	14097	5.5	232750	91.2	255204	3.3
AAABC05073	Boreal Chorus Frog	*Pseudacris triseriata maculata*	19515	0.4	79167	1.4	313750	5.7	5082000	92.5	5494432	1.8
AAABF01010	Plains Spadefoot Toad	*Scaphiopus bombifrons*	8	0	2389	1	5235	2.2	229750	96.8	237382	1
AAABH01170	Northern Leopard Frog	*Rana pipiens*	769	0	53744	2.9	102440	5.5	1721200	91.6	1878153	2.9
AAABH01200	Wood Frog	*Rana sylvatica*	6849	0.4	62700	3.4	107580	5.8	1674800	90.4	1851929	3.8
ABNBA01030	Common Loon	*Gavia immer*	0	0	4293	5.8	4693	6.3	65356	87.9	74342	5.8
ABNCA02010	Pied-Billed Grebe	*Podilymbus podiceps*	388	0	42203	5.1	68975	8.3	716630	86.5	828196	5.1
ABNCA03010	Horned Grebe	*Podiceps auritus*	191	0	44204	4.1	59779	5.5	986100	90.4	1090274	4.1
ABNCA03020	Red-Necked Grebe	*Podiceps grisegena*	0	0	37956	8.2	47243	10.3	375340	81.5	460539	8.2
ABNCA03030	Eared Grebe	*Podiceps nigricollis*	388	0	42203	5.1	68975	8.3	716630	86.5	828196	5.1
ABNCA04010	Western Grebe	*Aechmophorus occidentalis*	946	0.1	50899	3.2	80804	5	1477400	91.8	1610049	3.2
ABNFC01010	American White Pelican	*Pelecanus erythrorhynchos*	44	0	24273	7	26284	7.6	293870	85.3	344471	7.1
ABNFD01020	Double-Crested Cormorant	*Phalacrocorax auritus*	1760	0.1	46857	3.4	82077	6	1239600	90.5	1370294	3.6
ABNGA01020	American Bittern	*Botaurus lentiginosus*	20376	0.3	124080	1.6	444870	5.6	7340500	92.6	7929826	1.8
ABNGA02010	Least Bittern	*Ixobrychus exilis*	223	0	18230	2.8	35334	5.5	586020	91.6	639807	2.9
ABNGA04010	Great Blue Heron	*Ardea herodias*	1760	0.1	46857	3.4	82077	6	1239600	90.5	1370294	3.6
ABNGA07010	Cattle Egret	*Bubulcus ibis*	475	0	28178	1.9	49715	3.4	1385600	94.6	1463968	2
ABNGA08010	Green Heron	*Butorides virescens*	415	0.1	26806	3.4	37349	4.8	716540	91.7	781110	3.5
ABNGA11010	Black-Crowned Night-Heron	*Nycticorax nycticorax*	223	0	44249	4	61111	5.5	997040	90.4	1102623	4
ABNJB05030	Canada Goose	*Branta canadensis*	31769	0.4	143550	1.6	583240	6.5	8269000	91.6	9027559	1.9
ABNJB09010	Wood Duck	*Aix sponsa*	16500	0.7	61001	2.5	206070	8.4	2163200	88.4	2446771	3.2
ABNJB10010	American Green-Winged Teal	*Anas crecca*	31469	0.4	143510	1.6	576970	6.4	8227200	91.6	8979149	2
ABNJB10040	American Black Duck	*Anas rubripes*	1344	0	120400	2.2	159210	3	5103400	94.8	5384354	2.3
ABNJB10060	Mallard	*Anas platyrhynchos*	32355	0.2	148150	0.8	612880	3.4	17021000	95.5	17814385	1
ABNJB10110	Northern Pintail	*Anas acuta*	22431	0.1	139630	0.8	515420	3	16466000	96	17143481	1
ABNJB10130	Blue-Winged Teal	*Anas discors*	32347	0.2	148140	0.8	612490	3.4	16987000	95.5	17779977	1
ABNJB10140	Cinnamon Teal	*Anas cyanoptera*	1344	0	120400	2.2	159210	3	5103400	94.8	5384354	2.3
ABNJB10150	Northern Shoveler	*Anas clypeata*	29683	0.2	146540	0.8	580490	3.3	16936000	95.7	17692713	1
ABNJB10160	Gadwall	*Anas strepera*	32347	0.2	148140	0.8	612490	3.4	16987000	95.5	17779977	1
ABNJB10180	American Wigeon	*Anas americana*	31469	0.4	143510	1.6	576970	6.4	8227200	91.6	8979149	2

Appendix 5.1 (continued). Area and percent of terrestrial vertebrate species distributions by four stewardship status categories.												
Tnccode	Common name	Scientific name	status1		status2		status3		status4		total ha	% in status 1 and 2
			ha	%	ha	%	ha	%	ha	%		
ABNJB11020	Canvasback	*Aythya valisineria*	76	0	38994	5.3	62188	8.4	640130	86.3	741388	5.3
ABNJB11030	Redhead	*Aythya americana*	753	0.1	45010	3.4	75260	5.7	1192900	90.8	1313923	3.5
ABNJB11040	Ring-Necked Duck	*Aythya collaris*	401	0	43988	3.8	60970	5.2	1063300	91	1168659	3.8
ABNJB11070	Lesser Scaup	*Aythya affinis*	29056	0.3	141850	1.6	548610	6.2	8177700	91.9	8897216	1.9
ABNJB18010	Common Goldeneye	*Bucephala clangula*	0	0	10705	4.6	17280	7.4	204090	87.9	232075	4.6
ABNJB18030	Bufflehead	*Bucephala albeola*	0	0	18762	16	10726	9.2	87727	74.8	117215	16
ABNJB20010	Hooded Merganser	*Lophodytes cucullatus*	400	0	41532	4.9	57450	6.8	743160	88.2	842542	5
ABNJB22010	Ruddy Duck	*Oxyura jamaicensis*	598	0.1	39640	5	65846	8.3	691800	86.7	797884	5
ABNKA02010	Turkey Vulture	*Cathartes aura*	22819	0.6	25395	0.6	337590	8.3	3663400	90.5	4049204	1.2
ABNKC10010	Bald Eagle	*Haliaeetus leucocephalus*	604	0.1	6889	1.2	43889	7.9	505560	90.8	556942	1.4
ABNKC11010	Northern Harrier	*Circus cyaneus*	10066	0.1	55665	0.4	242700	1.8	13135000	97.7	13443431	0.5
ABNKC12020	Sharp-Shinned Hawk	*Accipiter striatus*	3935	3	1492	1.1	29361	22.6	95397	73.3	130185	4.2
ABNKC12040	Cooper's Hawk	*Accipiter cooperii*	6419	1.5	9551	2.2	53555	12.5	358720	83.8	428245	3.7
ABNKC19050	Broad-Winged Hawk	*Buteo platypterus*	349	0.2	6556	3.2	13517	6.5	186800	90.1	207221	3.3
ABNKC19070	Swainson's Hawk	*Buteo swainsoni*	36572	0.2	92889	0.6	567970	3.5	15599000	95.7	16296431	0.8
ABNKC19110	Red-Tailed Hawk	*Buteo jamaicensis*	19874	0.1	95114	0.6	433550	2.8	15148000	96.5	15696538	0.7
ABNKC19120	Ferruginous Hawk	*Buteo regalis*	29468	0.4	78930	1.1	482610	6.9	6399800	91.5	6990808	1.6
ABNKC22010	Golden Eagle	*Aquila chrysaetos*	17631	0.7	23934	1	264730	11.1	2086400	87.2	2392695	1.7
ABNKD06020	American Kestrel	*Falco sparverius*	27115	0.2	95917	0.6	497490	3.1	15182000	96.1	15802522	0.8
ABNKD06030	Merlin	*Falco columbarius*	14105	1.4	24034	2.4	191790	19.2	771270	77	1001199	3.8
ABNKD06090	Prairie Falcon	*Falco mexicanus*	28973	0.7	33525	0.8	419670	10.1	3683800	88.4	4165968	1.5
ABNLC11010	Ruffed Grouse	*Bonasa umbellus*	1710	1.2	2136	1.5	20356	13.9	122230	83.5	146432	2.6
ABNLC12010	Sage Grouse	*Centrocercus urophasianus*	1502	0.3	5193	1	110810	21.1	406480	77.6	523985	1.3
ABNLC13010	Greater Prairie-Chicken	*Tympanuchus cupido*	566	0	17939	0.7	11840	0.5	2423800	98.8	2454145	0.8
ABNLC13030	Sharp-Tailed Grouse	*Tympanuchus phasianellus*	34623	0.2	95098	0.6	543600	3.4	15323000	95.8	15996321	0.8
ABNLC14010	Wild Turkey	*Meleagris gallopavo*	27449	0.4	94022	1.3	482880	6.6	6755600	91.8	7359951	1.7
ABNME01010	Yellow Rail	*Coturnicops noveboracensis*	414	0	53005	3.2	76495	4.6	1525200	92.2	1655114	3.2
ABNME05030	Virginia Rail	*Rallus limicola*	720	0.1	44966	3.5	73929	5.7	1182000	90.8	1301615	3.5
ABNME08020	Sora	*Porzana carolina*	15460	0.7	59109	2.5	197920	8.3	2105600	88.5	2378089	3.1
ABNME14020	American Coot	*Fulica americana*	720	0.1	44966	3.5	73929	5.7	1182000	90.8	1301615	3.5
ABNNB03070	Piping Plover	*Charadrius melodus*	226	0	22936	5	35277	7.6	403010	87.3	461449	5
ABNNB03090	Killdeer	*Charadrius vociferus*	17122	0.1	67995	0.5	386350	2.6	14632000	96.9	15103467	0.6
ABNND02010	American Avocet	*Recurvirostra americana*	9685	0.5	54693	2.8	143000	7.4	1733400	89.3	1940778	3.3
ABNNF02010	Willet	*Catoptrophorus semipalmatus*	19234	0.4	117460	2.2	379620	7.1	4835200	90.4	5351514	2.6
ABNNF04020	Spotted Sandpiper	*Actitis macularia*	561	0.1	24847	4.9	37000	7.3	443700	87.7	506108	5
ABNNF06010	Upland Sandpiper	*Bartramia longicauda*	21663	0.3	130120	1.7	490770	6.2	7215300	91.8	7857853	1.9
ABNNF07070	Long-Billed Curlew	*Numenius americanus*	22757	1.3	19306	1.1	330340	19.1	1361300	78.5	1733703	2.4

Appendix 5.1 (continued). Area and percent of terrestrial vertebrate species distributions by four stewardship status categories.

Tnccode	Common name	Scientific name	status1		status2		status3		status4		total ha	% in status 1 and 2
			ha	%	ha	%	ha	%	ha	%		
ABNNF08040	Marbled Godwit	*Limosa fedoa*	22013	0.3	125260	1.5	482570	5.9	7610200	92.4	8240043	1.8
ABNNF18010	Common Snipe	*Gallinago gallinago*	15460	0.7	59109	2.5	197920	8.3	2105600	88.5	2378089	3.1
ABNNF20010	Wilson's Phalarope	*Phalaropus tricolor*	22249	0.3	135630	1.6	487310	5.8	7754000	92.3	8399189	1.9
ABNNM03020	Franklin's Gull	*Larus pipixcan*	65	0	27754	0.4	44228	0.6	7446700	99	7518747	0.4
ABNNM03100	Ring-Billed Gull	*Larus delawarensis*	403	0	58749	0.6	113070	1.2	9594900	98.2	9767122	0.6
ABNNM03110	California Gull	*Larus californicus*	185	0	56314	0.7	122680	1.6	7416900	97.6	7596079	0.7
ABNNM08070	Common Tern	*Sterna hirundo*	6	0	36156	5.6	47928	7.4	566490	87.1	650580	5.6
ABNNM08090	Forster's Tern	*Sterna forsteri*	191	0	43700	4.2	57983	5.5	948270	90.3	1050144	4.2
ABNNM08100	Least Tern	*Sterna antillarum*	223	0.6	919	2.3	7808	19.4	31378	77.8	40328	2.8
ABNNM10020	Black Tern	*Chlidonias niger*	223	0	44249	4	61111	5.5	997040	90.4	1102623	4
ABNPB04040	Mourning Dove	*Zenaida macroura*	6428	1.4	9562	2.1	53945	11.7	392380	84.9	462315	3.5
ABNRB02010	Black-Billed Cuckoo	*Coccyzus erythropthalmus*	25729	1.3	27182	1.3	254200	12.6	1713300	84.8	2020411	2.6
ABNSB01030	Eastern Screech-Owl	*Otus asio*	12297	1.3	14751	1.5	110090	11.5	823610	85.7	960748	2.8
ABNSB05010	Great Horned Owl	*Bubo virginianus*	6419	1.5	9551	2.2	53555	12.5	358720	83.8	428245	3.7
ABNSB10010	Burrowing Owl	*Athene cunicularia*	11654	0.4	43238	1.4	258690	8.2	2860200	90.1	3173782	1.7
ABNSB13010	Long-Eared Owl	*Asio otus*	9219	1.5	11938	2	87635	14.3	503030	82.2	611822	3.5
ABNSB13040	Short-Eared Owl	*Asio flammeus*	12327	0.2	70565	1.1	339580	5.4	5876800	93.3	6299272	1.3
ABNTA02020	Common Nighthawk	*Chordeiles minor*	10542	0.1	68180	0.6	273910	2.2	11963000	97.1	12315632	0.6
ABNTA04010	Common Poorwill	*Phalaenoptilus nuttallii*	21713	3.1	6027	0.9	201400	28.7	473590	67.4	702730	4
ABNUA03010	Chimney Swift	*Chaetura pelagica*	2390	0.7	6740	1.9	28318	8	318190	89.5	355637	2.6
ABNUC45010	Ruby-Throated Hummingbird	*Archilochus colubris*	348	0.2	4918	2.5	10827	5.5	181190	91.8	197283	2.7
ABNXD01020	Belted Kingfisher	*Ceryle alcyon*	565	0.1	39595	5	64514	8.2	680850	86.7	785524	5.1
ABNYF04040	Red-Headed Woodpecker	*Melanerpes erythrocephalus*	4059	1.3	7426	2.3	36113	11.2	276040	85.3	323638	3.6
ABNYF05010	Yellow-Bellied Sapsucker	*Sphyrapicus varius*	349	0.1	7019	3	13543	5.8	214540	91.1	235450	3.1
ABNYF07030	Downy Woodpecker	*Picoides pubescens*	6428	1.4	9562	2.1	53945	11.7	392380	84.9	462315	3.5
ABNYF07040	Hairy Woodpecker	*Picoides villosus*	6428	1.4	9562	2.1	53945	11.7	392380	84.9	462315	3.5
ABNYF10020	Northern Flicker	*Colaptes auratus*	12203	1.4	13979	1.6	108870	12.1	764520	85	899572	2.9
ABNYF12020	Pileated Woodpecker	*Dryocopus pileatus*	349	0.3	1935	1.6	5566	4.7	111130	93.4	118979	1.9
ABPAE32050	Western Wood-Pewee	*Contopus sordidulus*	462	3.4	246	1.8	2199	16.3	10610	78.5	13517	5.2
ABPAE32060	Eastern Wood-Pewee	*Contopus virens*	365	0.1	7884	2.7	19043	6.5	267120	90.7	294412	2.8
ABPAE33030	Alder Flycatcher	*Empidonax alnorum*	51	0.1	354	0.4	8308	8.7	87102	90.9	95814	0.4
ABPAE33040	Willow Flycatcher	*Empidonax traillii*	21056	1.2	25939	1.5	214390	12.4	1464900	84.9	1726285	2.7
ABPAE33070	Least Flycatcher	*Empidonax minimus*	6775	1.3	10666	2	77961	14.7	434910	82	530312	3.3
ABPAE35020	Eastern Phoebe	*Sayornis phoebe*	399	0.1	22645	3.5	38040	5.8	590360	90.6	651444	3.5
ABPAE35030	Say's Phoebe	*Sayornis saya*	20467	0.6	52449	1.5	320050	9.2	3102400	88.8	3495366	2.1
ABPAE43070	Great Crested Flycatcher	*Myiarchus crinitus*	368	0.1	6339	2.2	18858	6.5	265510	91.2	291074	2.3
ABPAE52050	Western Kingbird	*Tyrannus verticalis*	35297	0.7	59397	1.2	447730	9	4416500	89.1	4958924	1.9

Appendix 5.1 (continued). Area and percent of terrestrial vertebrate species distributions by four stewardship status categories.												
Tnccode	Common name	Scientific name	status1		status2		status3		status4		total ha	% in status 1 and 2
			ha	%	ha	%	ha	%	ha	%		
ABPAE52060	Eastern Kingbird	*Tyrannus tyrannus*	28781	0.5	60141	1.1	390730	7.3	4880200	91.1	5359852	1.7
ABPAT02010	Horned Lark	*Eremophila alpestris*	28558	0.2	73393	0.5	481020	3.1	14939000	96.2	15521971	0.7
ABPAU01010	Purple Martin	*Progne subis*	2	0	772	1	829	1	77975	98	79578	1
ABPAU03010	Tree Swallow	*Tachycineta bicolor*	3730	0.1	48384	1.2	154100	3.8	3863700	94.9	4069914	1.3
ABPAU07010	Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*	8755	1.3	26684	4	92477	13.8	542020	80.9	669936	5.3
ABPAU08010	Bank Swallow	*Riparia riparia*	561	0.1	24847	4.9	37000	7.3	443700	87.7	506108	5
ABPAU09010	Cliff Swallow	*Petrochelidon pyrrhonota*	3906	0	22796	0.2	143360	1.2	11688000	98.6	11858062	0.2
ABPAU09030	Barn Swallow	*Hirundo rustica*	4479	0	62402	0.5	208270	1.6	12402000	97.8	12677151	0.5
ABPAV02020	Blue Jay	*Cyanocitta cristata*	6522	1.2	10334	2	55163	10.5	451480	86.2	523499	3.2
ABPAV09010	Black-Billed Magpie	*Pica pica*	31885	0.9	43774	1.2	378290	10.5	3139400	87.4	3593349	2.1
ABPAV10010	American Crow	*Corvus brachyrhynchos*	12281	1.3	14751	1.5	110090	11.5	823600	85.7	960722	2.8
ABPAW01010	Black-Capped Chickadee	*Poecile atricapillus*	6522	1.2	10334	2	55163	10.5	451480	86.2	523499	3.2
ABPAZ01010	Red-Breasted Nuthatch	*Sitta canadensis*	2135	19	411	3.7	3460	30.8	5222	46.5	11228	22.7
ABPAZ01020	White-Breasted Nuthatch	*Sitta carolinensis*	9126	1.7	11166	2	86417	15.7	443940	80.6	550649	3.7
ABPBG03010	Rock Wren	*Salpinctes obsoletus*	617	4.2	194	1.3	4465	30.6	9309	63.8	14585	5.6
ABPBG09010	House Wren	*Troglodytes aedon*	9852	1.1	13479	1.5	100410	11.4	755490	85.9	879231	2.7
ABPBG10010	Sedge Wren	*Cistothorus platensis*	759	0	77903	2.1	117880	3.2	3453600	94.6	3650142	2.2
ABPBG10020	Marsh Wren	*Cistothorus palustris*	198	0	46298	3.6	67194	5.2	1179400	91.2	1293090	3.6
ABPBJ15010	Eastern Bluebird	*Sialia sialis*	36233	0.5	99696	1.3	543630	7.1	6973700	91.1	7653259	1.8
ABPBJ15030	Mountain Bluebird	*Sialia currucoides*	30530	2.2	29811	2.1	322010	22.9	1025800	72.8	1408151	4.3
ABPBJ18080	Veery	*Catharus fuscescens*	2425	0.7	8147	2.4	34450	10	299410	86.9	344432	3.1
ABPBJ20170	American Robin	*Turdus migratorius*	6522	1.2	10334	2	55163	10.5	451480	86.2	523499	3.2
ABPBK01010	Gray Catbird	*Dumetella carolinensis*	24861	2	20084	1.6	226310	18	986320	78.4	1257575	3.6
ABPBK03010	Northern Mockingbird	*Mimus polyglottos*	9845	1.1	13395	1.5	98640	11.3	749450	86	871330	2.7
ABPBK06010	Brown Thrasher	*Toxostoma rufum*	23181	1.6	20433	1.4	214590	14.7	1206000	82.4	1464204	3
ABPBM02060	Sprague's Pipit	*Anthus spragueii*	17760	0.5	53286	1.4	297240	7.8	3435000	90.3	3803286	1.9
ABPBN01020	Cedar Waxwing	*Bombycilla cedrorum*	25721	1.3	27099	1.3	252430	12.5	1707200	84.8	2012450	2.6
ABPBR01030	Loggerhead Shrike	*Lanius ludovicianus*	34778	0.2	89995	0.6	552700	3.4	15375000	95.8	16052473	0.8
ABPBW01110	Bell's Vireo	*Vireo bellii*	155	0.1	438	0.1	9135	3	299040	96.8	308769	0.2
ABPBW01170	Yellow-Throated Vireo	*Vireo flavifrons*	356	0.1	7522	2	17739	4.8	345410	93.1	371026	2.1
ABPBW01210	Warbling Vireo	*Vireo gilvus*	4296	1	9063	2	45593	10.3	384000	86.7	442952	3
ABPBW01230	Philadelphia Vireo	*Vireo philadelphicus*	0	0	345	0.4	11395	13.7	71566	85.9	83306	0.4
ABPBW01240	Red-Eyed Vireo	*Vireo olivaceus*	9102	1.1	12650	1.6	91344	11.3	692870	86	805966	2.7
ABPBX01050	Orange-Crowned Warbler	*Vermivora celata*	0	0	345	0.4	11395	13.7	71566	85.9	83306	0.4
ABPBX01060	Nashville Warbler	*Vermivora ruficapilla*	0	0	344	0.4	11098	13.6	69928	85.9	81370	0.4
ABPBX03010	Yellow Warbler	*Dendroica petechia*	12550	1.3	15083	1.6	132890	13.7	807050	83.4	967573	2.9
ABPBX03020	Chestnut-Sided Warbler	*Dendroica pensylvanica*	0	0	345	0.4	11293	13.2	73802	86.4	85440	0.4

Appendix 5.1 (continued). Area and percent of terrestrial vertebrate species distributions by four stewardship status categories.

Tnccode	Common name	Scientific name	status1		status2		status3		status4		total ha	% in status 1 and 2
			ha	%	ha	%	ha	%	ha	%		
ABPBX05010	Black-And-White Warbler	*Mniotilta varia*	4069	1	9051	2.2	45136	11.1	350170	85.7	408426	3.2
ABPBX06010	American Redstart	*Setophaga ruticilla*	6419	1.5	9551	2.2	53555	12.5	358720	83.8	428245	3.7
ABPBX10010	Ovenbird	*Seiurus aurocapillus*	5380	1.5	7659	2.1	45407	12.6	301110	83.7	359556	3.6
ABPBX10020	Northern Waterthrush	*Seiurus noveboracensis*	0	0	14009	9.2	8804	5.8	129970	85.1	152783	9.2
ABPBX11030	Mourning Warbler	*Oporornis philadelphia*	0	0	344	0.4	11098	13.6	69928	85.9	81370	0.4
ABPBX12010	Common Yellowthroat	*Geothlypis trichas*	24262	0.1	103150	0.6	500120	3	15966000	96.2	16593532	0.8
ABPBX24010	Yellow-Breasted Chat	*Icteria virens*	35045	0.6	65270	1.2	486460	8.8	4946600	89.4	5533375	1.8
ABPBX45040	Scarlet Tanager	*Piranga olivacea*	365	0.1	6342	2.4	19202	7.3	238310	90.2	264219	2.5
ABPBX61030	Rose-Breasted Grosbeak	*Pheucticus ludovicianus*	368	0.1	7885	2.5	20426	6.5	287930	90.9	316609	2.6
ABPBX61040	Black-Headed Grosbeak	*Pheucticus melanocephalus*	3720	2.1	1326	0.8	31055	17.8	138560	79.3	174661	2.9
ABPBX63010	Blue Grosbeak	*Guiraca caerulea*	997	0.1	5456	0.6	47289	5.6	788880	93.6	842622	0.8
ABPBX64020	Lazuli Bunting	*Passerina amoena*	25015	1.6	20996	1.3	240230	14.9	1322900	82.2	1609141	2.9
ABPBX64030	Indigo Bunting	*Passerina cyanea*	25626	1.3	26399	1.4	252590	13.1	1620500	84.2	1925115	2.7
ABPBX65010	Dickcissel	*Spiza americana*	27897	0.2	92304	0.6	489900	3.1	15234000	96.1	15844101	0.8
ABPBX74030	Eastern Towhee	*Pipilo erythrophthalmus*	51	0	1532	1.4	12132	11.1	95931	87.5	109645	1.4
ABPBX74080	Spotted Towhee	*Pipilo maculatus*	25249	1.6	20714	1.3	239020	15.1	1301000	82	1585983	2.9
ABPBX94020	Chipping Sparrow	*Spizella passerina*	25721	1.3	27099	1.3	252430	12.5	1707200	84.8	2012450	2.6
ABPBX94030	Clay-Colored Sparrow	*Spizella pallida*	36115	0.5	98913	1.3	542020	7.2	6881000	91	7558048	1.8
ABPBX94040	Brewer's Sparrow	*Spizella breweri*	16693	3	4497	0.8	183250	32.7	356480	63.6	560920	3.8
ABPBX94050	Field Sparrow	*Spizella pusilla*	29631	1.3	42370	1.9	323400	14.2	1882700	82.6	2278101	3.2
ABPBX95010	Vesper Sparrow	*Pooecetes gramineus*	32576	0.2	80763	0.5	515410	3.3	15171000	96	15799749	0.7
ABPBX96010	Lark Sparrow	*Chondestes grammacus*	24118	0.2	74837	0.5	430180	2.8	14787000	96.5	15316135	0.7
ABPBX98010	Lark Bunting	*Calamospiza melanocorys*	30649	0.2	90859	0.6	529940	3.3	15615000	96	16266448	0.8
ABPBX99010	Savannah Sparrow	*Passerculus sandwichensis*	31612	0.2	146280	0.8	610380	3.4	16947000	95.6	17735272	1
ABPBXA0010	Baird's Sparrow	*Ammodramus bairdii*	12327	0.2	70565	1.1	339580	5.4	5876800	93.3	6299272	1.3
ABPBXA0020	Grasshopper Sparrow	*Ammodramus savannarum*	27802	0.2	87003	0.5	490840	3.1	15279000	96.2	15884645	0.7
ABPBXA0040	Le Conte's Sparrow	*Ammodramus leconteii*	18933	0.4	66571	1.3	291020	5.5	4939000	92.9	5315524	1.6
ABPBXA0070	Nelson's Sharp-Tailed Sparrow	*Ammodramus nelsoni*	726	0	56489	1.6	95634	2.8	3272600	95.5	3425449	1.7
ABPBXA3010	Song Sparrow	*Melospiza melodia*	30460	0.4	106310	1.3	519760	6.4	7518800	92	8175330	1.7
ABPBXA3030	Swamp Sparrow	*Melospiza georgiana*	292	0	19706	1.1	53448	3.1	1671400	95.8	1744846	1.2
ABPBXA4020	White-Throated Sparrow	*Zonotrichia albicollis*	0	0	1372	2.5	7236	13.2	46150	84.3	54758	2.5
ABPBXA6010	Mccown's Longspur	*Calcarius mccownii*	863	0.2	2804	0.6	63979	13.3	415090	86	482735	0.8
ABPBXA6040	Chestnut-Collared Longspur	*Calcarius ornatus*	10203	0.1	57029	0.5	267570	2.2	11727000	97.2	12061802	0.6
ABPBXA9010	Bobolink	*Dolichonyx oryzivorus*	25819	0.2	71733	0.5	446820	2.9	14843000	96.5	15387372	0.6
ABPBXB0010	Red-Winged Blackbird	*Agelaius phoeniceus*	19525	0.1	88592	0.6	345780	2.4	13926000	96.8	14379897	0.8
ABPBXB2030	Western Meadowlark	*Sturnella neglecta*	32613	0.2	95555	0.6	544250	3.4	15419000	95.8	16091418	0.8
ABPBXB3010	Yellow-Headed Blackbird	*Xanthocephalus xanthocephalus*	720	0.1	44966	3.5	73929	5.7	1182000	90.8	1301615	3.5

Appendix 5.1 (continued). Area and percent of terrestrial vertebrate species distributions by four stewardship status categories.												
Tnccode	Common name	Scientific name	status1		status2		status3		status4		total ha	% in status 1 and 2
			ha	%	ha	%	ha	%	ha	%		
ABPBXB5020	Brewer's Blackbird	*Euphagus cyanocephalus*	22332	0.5	77851	1.8	369620	8.4	3909500	89.3	4379303	2.3
ABPBXB6070	Common Grackle	*Quiscalus quiscula*	1133	0	4641	0.1	36172	0.4	8803200	99.5	8845146	0.1
ABPBXB7030	Brown-Headed Cowbird	*Molothrus ater*	37123	0.2	104330	0.6	579310	3.5	15743000	95.6	16463763	0.9
ABPBXB9070	Orchard Oriole	*Icterus spurius*	15565	0.4	33249	0.8	240570	6	3725900	92.8	4015284	1.2
ABPBXB9190	Baltimore Oriole	*Icterus galbula*	4390	0.9	9835	2	46812	9.3	443090	87.9	504126	2.8
ABPBXB9220	Bullock's Oriole	*Icterus bullockii*	1223	1.8	376	0.6	9142	13.6	56659	84.1	67400	2.4
ABPBY04020	Purple Finch	*Carpodacus purpureus*	50	0	396	0.4	11527	10.4	99229	89.2	111202	0.4
ABPBY04040	House Finch	*Carpodacus mexicanus*	4170	0.9	9003	1.9	43751	9.2	417200	88	474124	2.8
ABPBY05010	Red Crossbill	*Loxia curvirostra*	3263	1	7160	2.1	37055	10.9	292740	86	340218	3.1
ABPBY06030	Pine Siskin	*Carduelis pinus*	6419	1.5	9551	2.2	53555	12.5	358720	83.8	428245	3.7
ABPBY06110	American Goldfinch	*Carduelis tristis*	20537	0.5	49694	1.1	323270	7.2	4126800	91.3	4520301	1.6
AMAAA01010	Virginia Opossum	*Didelphis virginiana*	153	0.2	1776	2	2963	3.4	82612	94.4	87504	2.2
AMABA01190	Arctic Shrew	*Sorex arcticus*	679	0.1	34926	3.6	35179	3.6	898850	92.7	969634	3.7
AMABA01250	Pigmy Shrew	*Microsorex hoyi*	937	0.1	42400	3.1	41854	3.1	1281300	93.8	1366491	3.2
AMABA01280	Hayden's Shrew	*Sorex haydenii*	8428	0.2	57743	1.2	239240	4.9	4545900	93.7	4851311	1.4
AMABA03010	Northern Short-tailed Shrew	*Blarina brevicauda*	2092	0	115720	1	189960	1.6	11692000	97.4	11999772	1
AMACC01010	Little Brown Bat	*Myotis lucifugus*	8988	0.2	99796	2.1	285970	6.1	4263800	91.5	4658554	2.3
AMACC01060	Keen's Myotis	*Myotis keenii*	749	0.2	8415	2.3	29159	8	326950	89.5	365272	2.5
AMACC01070	Long-eared Myotis	*Myotis evotis*	4442	4.5	2419	2.4	24319	24.6	67607	68.4	98786	6.9
AMACC01110	Long-legged Myotis	*Myotis volans*	20350	3.4	7393	1.2	164450	27.1	413590	68.3	605783	4.6
AMACC01140	Small-footed Myotis	*Myotis leibii*	16443	2.6	12547	2	213980	34	386100	61.4	629070	4.6
AMACC02010	Silver-haired Bat	*Lasionycteris noctivagans*	3120	1.3	6854	2.8	29941	12.2	205580	83.7	245495	4.1
AMACC04010	Big Brown Bat	*Eptesicus fuscus*	20489	0.7	41338	1.5	252890	9	2487500	88.8	2802217	2.2
AMACC05010	Eastern Red Bat	*Lasiurus borealis*	21496	0.9	59552	2.6	270680	11.9	1917800	84.5	2269528	3.6
AMACC05030	Hoary Bat	*Lasiurus cinereus*	6428	1.4	9562	2.1	53945	11.7	392380	84.9	462315	3.5
AMAEB01040	Eastern Cottontail	*Sylvilagus floridanus*	37116	0.2	104240	0.6	577540	3.5	15737000	95.6	16455896	0.9
AMAEB01060	Nuttall's Cottontail	*Sylvilagus nuttallii*	17902	3.8	7704	1.6	138650	29.7	303000	64.8	467256	5.5
AMAEB01070	Desert Cottontail	*Sylvilagus audubonii*	29399	1.6	18675	1	326990	17.4	1502700	80	1877764	2.6
AMAEB03010	Snowshoe Hare	*Lepus americanus*	9650	0.8	21659	1.8	146930	12.3	1013200	85	1191439	2.6
AMAEB03040	White-tailed Jackrabbit	*Lepus townsendii*	31072	0.5	73394	1.1	457990	6.9	6079000	91.5	6641456	1.6
AMAFB02020	Least Chipmunk	*Eutamius minimus*	18963	2.4	6751	0.9	219880	28	540120	68.7	785714	3.3
AMAFB02230	Eastern Chipmunk	*Tamias striatus*	347	0.2	2588	1.6	12582	7.7	148730	90.6	164246	1.8
AMAFB03010	Woodchuck	*Marmota monax*	623	0.1	11474	2.2	23801	4.5	488490	93.2	524388	2.3
AMAFB05040	Richardson's Ground Squirrel	*Spermophilus richardsonii*	731	0	63224	1.6	104970	2.7	3693500	95.6	3862425	1.7
AMAFB05090	Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	30603	0.2	93919	0.6	522760	3.3	15319000	95.9	15966282	0.8
AMAFB05120	Franklin's Ground Squirrel	*Spermophilus franklinii*	895	0	65055	2.4	73577	2.7	2584900	94.9	2724427	2.4
AMAFB06010	Black-tailed Prairie Dog	*Cynomys ludovicianus*	17917	0.9	14331	0.7	256690	13.4	1624000	84.9	1912938	1.7

Appendix 5.1 (continued). Area and percent of terrestrial vertebrate species distributions by four stewardship status categories.

Tnccode	Common name	Scientific name	status1		status2		status3		status4		total ha	% in status 1 and 2
			ha	%	ha	%	ha	%	ha	%		
AMAFB07010	Gray Squirrel	*Sciurus carolinensis*	773	0	27423	0.3	78840	0.9	8294700	98.7	8401736	0.3
AMAFB07040	Eastern Fox Squirrel	*Sciurus niger*	6209	1.3	9561	2.1	53841	11.7	391740	84.9	461351	3.4
AMAFB08010	Red Squirrel	*Tamiasciurus hudsonicus*	143	0.1	1569	1.6	10582	10.5	88422	87.8	100716	1.7
AMAFB09020	Northern Flying Squirrel	*Glaucomys sabrinus*	155	0.3	1685	3.1	3503	6.4	49607	90.3	54949	3.4
AMAFC01040	Northern Pocket Gopher	*Thomomys talpoides*	5193	0	60120	0.5	229690	1.8	12266000	97.7	12561003	0.5
AMAFC02010	Plains Pocket Gopher	*Geomys bursarius*	531	0	14975	0.6	14397	0.5	2608200	98.9	2638103	0.6
AMAFD01010	Olived-backed Pocket Mouse	*Perognathus fasciatus*	797	0	21675	1.1	26701	1.4	1857700	97.4	1906873	1.2
AMAFD01020	Plains Pocket Mouse	*Perognathus flavescens*	542	0.1	16310	3.2	6836	1.3	488510	95.4	512198	3.3
AMAFD03010	Ord's Kangaroo Rat	*Dipodomys ordii*	0	0	0	0	3035	6.1	46629	93.9	49664	0
AMAFD05050	Hispid Pocket Mouse	*Perognathus hispidus*	12	0	0	0	1977	1	187300	98.9	189289	0
AMAFE01010	American Beaver	*Castor canadensis*	10395	0.8	37858	2.9	135240	10.2	1144300	86.2	1327793	3.6
AMAFF02010	Plains Harvest Mouse	*Reithrodontomys montanus*	0	0.0	0	0.0	3914	30.1	9085	69.9	12999	0.0
AMAFF02030	Western Harvest Mouse	*Reithrodontomys megalotis*	31826	0.3	67097	0.6	505490	4.7	10247000	94.4	10851413	0.9
AMAFF03040	Deer Mouse	*Peromyscus maniculatus*	27905	0.2	92315	0.6	490290	3.1	15267000	96.2	15877510	0.8
AMAFF03070	White-footed Mouse	*Peromyscus leucopus*	34258	0.5	87369	1.2	499580	7	6467400	91.2	7088607	1.7
AMAFF06010	Northern Grasshopper Mouse	*Onychomys leucogaster*	3874	0	76582	0.6	198670	1.4	13446000	98	13725126	0.6
AMAFF08090	Bushy-tailed Woodrat	*Neotoma cinerea*	17411	3.8	6588	1.5	138640	30.5	291220	64.2	453859	5.3
AMAFF09020	Southern Red-backed Vole	*Clethrionomys gapperi*	20848	1.2	24381	1.4	222290	12.4	1520000	85	1787519	2.5
AMAFF11010	Meadow Vole	*Microtus pennsylvanicus*	1204	0.1	48185	2.3	95999	4.6	1956200	93.1	2101588	2.4
AMAFF11140	Prairie Vole	*Microtus ochrogaster*	32164	0.4	87296	1.2	490600	6.8	6594900	91.5	7204960	1.7
AMAFF13010	Sagebrush Vole	*Lagurus curtatus*	18447	1.4	13343	1	244290	19.1	1005200	78.5	1281280	2.5
AMAFF15010	Muskrat	*Ondatra zibethicus*	6567	0.4	49945	3.3	126310	8.2	1348400	88.1	1531222	3.7
AMAFH01010	Meadow Jumping Mouse	*Zapus hudsonius*	32552	0.4	112880	1.4	534590	6.5	7497700	91.7	8177722	1.8
AMAFH01020	Western Jumping Mouse	*Zapus princeps*	573	0	61257	1.6	69746	1.8	3792700	96.6	3924276	1.6
AMAFJ01010	Common Porcupine	*Erethizon dorsatum*	6419	1.5	9551	2.2	53555	12.5	358720	83.8	428245	3.7
AMAJA01010	Coyote	*Canis latrans*	37474	0.2	116240	0.7	599810	3.4	16658000	95.7	17411524	0.9
AMAJA03010	Red Fox	*Vulpes vulpes*	37474	0.2	116240	0.7	599810	3.4	16658000	95.7	17411524	0.9
AMAJA04010	Common Gray Fox	*Urocyon cineroargenteus*	413	0	8667	0.2	30334	0.6	5435700	99.3	5475114	0.2
AMAJE02010	Common Raccoon	*Procyon lotor*	38134	0.2	156610	0.9	665550	3.6	17398000	95.3	18258294	1.1
AMAJF01020	Fisher	*Martes pennanti*										
AMAJF02010	Ermine	*Mustela erminea*	779	0	30378	1.6	62014	3.3	1788900	95	1882071	1.7
AMAJF02020	Least Weasel	*Mustela nivalis*	18926	0.1	103520	0.6	428670	2.7	15413000	96.5	15964116	0.8
AMAJF02030	Long-tailed Weasel	*Mustela frenata*	36575	0.4	111600	1.3	563750	6.6	7855600	91.7	8567525	1.7
AMAJF02050	Mink	*Mustela vison*	16659	0.6	67688	2.6	210560	8.1	2295400	88.6	2590307	3.3
AMAJF04010	American Badger	*Taxidea taxus*	33624	0.2	101070	0.6	559320	3.4	15577000	95.7	16271014	0.8
AMAJF05010	Eastern Spotted Skunk	*Spilogale putorius*	607	0	10922	1.3	4784	0.6	823740	98	840053	1.4
AMAJF06010	Striped Skunk	*Mephitis mephitis*	37474	0.2	116240	0.7	599810	3.4	16658000	95.7	17411524	0.9

Appendix 5.1 (continued). Area and percent of terrestrial vertebrate species distributions by four stewardship status categories.												
Tnccode	Common name	Scientific name	status1		status2		status3		status4		total ha	% in status 1 and 2
			ha	%	ha	%	ha	%	ha	%		
AMAJF08010	River Otter	*Lutra canadensis*	64	0.4	342	1.9	1010	5.7	16180	92	17596	2.3
AMAJH03020	Bobcat	*Felis rufus*	27919	0.7	61631	1.6	367440	9.6	3387900	88.1	3844890	2.3
AMALC01010	Elk	*Cervus elaphus*	15207	0.7	37708	1.8	192400	9.4	1809900	88.1	2055215	2.6
AMALC02010	Mule Deer	*Odocoileus hemionus*	35045	0.6	25887	0.4	460930	7.8	5387800	91.2	5909662	1.0
AMALC02020	White-tailed Deer	*Odocoileus virginianus*	37474	0.2	116240	0.7	599810	3.4	16658000	95.7	17411524	0.9
AMALC03010	Moose	*Alces alces*	391	0	7359	0.2	24153	0.6	4252500	99.3	4284403	0.2
AMALD01010	Pronghorn	*Antilocapridae americana*	16214	0.9	12817	0.7	221400	12.4	1529700	85.9	1780131	1.6
AMALE04010	Bighorn Sheep	*Ovis canadensis*	15423	3.5	10609	2.4	155580	34.8	265380	59.4	446992	5.8
ARAAB01012	Common Snapping Turtle	*Chelydra serpentina*	565	0.1	39595	5	64514	8.2	680850	86.7	785524	5.1
ARAAD01011	Western Painted Turtle	*Chrysemys picta belli*	16500	0.7	61001	2.5	206070	8.4	2163200	88.4	2446771	3.2
ARAAD05082	False Map Turtle	*Graptemys pseudogeographica*	0	0	0	0	8391	19.6	34440	80.4	42831	0
ARAAG01022	Midland Smooth Softshell Turtle	*Apalone mutica*	0	0	0	0	1195	15.5	6536	84.5	7732	0
ARACF12032	Eastern Short Horned Lizard	*Phrynosoma douglassi brevirostre*	23765	2.6	15164	1.7	258080	28.5	609300	67.2	906309	4.3
ARACF14032	Northern Sagebrush Lizard	*Sceloporus graciosus graciosus*	15620	6.3	5182	2.1	102660	41.4	124390	50.2	247852	8.4
ARACH01102	Northern Prairie Skink	*Eumeces septentrionalis*	190	1.5	5217	40.3	835	6.4	6713	51.8	12955	41.7
ARADB07014	Eastern Yellowbelly Racer	*Coluber constrictor flaviventris*	29946	1.2	19356	0.8	350060	14.2	2058900	83.8	2458262	2
ARADB17010	Western Hognose Snake	*Heterodon nasicus*	508	0.1	13575	2.4	13506	2.4	537980	95.1	565569	2.5
ARADB23020	Smooth Green Snake	*Opheodrys vernalis*	7301	0.4	37620	2.3	107760	6.5	1500700	90.8	1653381	2.7
ARADB2601A	Bullsnake	*Pituophis melanoleucus sayi*	6899	0.2	15759	0.5	150470	5	2813800	94.2	2986928	0.8
ARADB34032	Northern Red-bellied Snake	*Storeria occipitomaculata*	1053	0.1	49337	3.4	59952	4.1	1360300	92.5	1470642	3.4
ARADB36100	Plains Garter Snake	*Thamnophis radix*	37479	0.2	130990	0.7	627330	3.5	16895000	95.5	17690799	1
ARADB36130	Red-sided Garter Snake	*Thamnophis sirtalis parietalis*	37480	0.2	152790	0.8	655320	3.6	17194000	95.3	18039590	1.1
ARADE02128	Prairie Rattlesnake	*Crotalus viridis viridis*	20329	1	16369	0.8	286610	14.3	1676100	83.8	1999408	1.8

Appendix 7.1 List of Example GAP Applications

Businesses and Non-government Organizations:
The following are some examples of applications of GAP data by the private sector:

- The Wyoming Natural Heritage Program (a private non-government organization) transformed the endangered and sensitive species database into a spatially referenced digital geographic information system using the GAP digital base map and other GAP spatial data.
- Hughes Corp. is experimenting with the Utah and Nevada GAP digital base maps, simulating images to aid the development of new space-based remote sensing devices.
- The Nature Conservancy used the Wyoming GAP data to develop a map of ecoregions of Wyoming.
- Weyerhaeuser Corp. is using the Arkansas GAP data in managing their lands in Arkansas.
- IBM Corp. is funding a project at the University of California-Santa Barbara that, in part, uses GAP data in the development of visualization software.
- NM-GAP vegetation data is being used for an environmental assessment of a proposed spaceport, a state/private venture.

County and City Planning:
Some other examples of the use of GAP by local governments are:

- CA-GAP biological data were combined with the Southern California Association of Governments (SCAG) land ownership data to show which ownerships and jurisdictions were needed for joint conservation planning and management of a particular natural community or species, maximizing efficiency and minimizing the potential for yet another conservation crisis.
- In California, county and city planners of several jurisdictions, wildlife agencies, developers of the 4S Ranch property, and the state Natural Communities Conservation Planning program used the GAP regional data, as well as more detailed information, to conserve 1,640 acres of habitat within a 2,900-acre planned development.
- Day-to-day county planning operations in Piute, Grande, and Washington counties, Utah.
- County planners in Piute County, Utah, used GAP data to optimize the siting of a proposed sawmill for aspen with respect to the distribution of aspen stands.
- Missoula County, Montana, used the GAP land cover map of the area as a base map for its comprehensive long-range plan.
- Snohomish County, Washington, used the GAP land cover map in meeting state requirements for a growth management plan.
- The City of Bainbridge Island, Washington, used GAP data to assist them in development of a watershed planning project.

State Uses:
The following are some examples of uses of GAP data by state agencies.

- The GAP database of species habitats was used by the Tennessee Wildlife Resources Agency (TWRA) to update its book "Species in Need of Management."
- Images of land cover derived from GAP TM data are used by TWRA for locating particular habitat types. Information on the locations of these habitat types is provided by TWRA to the public for a wide variety of public service functions, from education to cooperative resource management.
- Early GAP data developed by TWRA were used to help identify an extremely important area of the state with high biodiversity that was subsequently purchased by the state for conservation.
- Preliminary findings from GAP were used by TWRA to develop three resource management initiatives.
- The Tennessee GAP project, which is being carried out primarily by TWRA, is the foundation of a multi-agency, long-term biodiversity program for Tennessee.
- GAP data have been used by the Tennessee Forestry Stewardship Program to help develop a district program for nine conservation planning districts, outlining Best Management Practices (BMPs) for biological conservation on private lands.
- GAP data are being used extensively by TWRA in the preparation of project proposals to the North American Waterfowl Conservation Program. These proposals require that biodiversity issues are addressed in specific detail. The use of GAP data on occurrence of land cover types and terrestrial vertebrates has made this possible.
- The Wyoming Department of Fish and Game used GAP data to assist them in transforming the Wildlife Observation System database into a spatially referenced geographic information system.
- The Utah Division of Wildlife Resources and the Bear River Water Conservancy District used the Utah GAP land cover map in a resource management assessment for mitigating conflicts between a proposed groundwater withdrawal project and the maintenance of an elk calving area in the Uinta Mountains.
- The Utah Division of Wildlife Resources, the Rocky Mountain Elk Foundation, and Sheik Safari International used the Utah GAP land cover map to identify critical elk habitat. The environmental profile of these areas was then used to identify other similar areas for elk habitat enhancement.
- The Utah Division of Wildlife Resources used the Utah GAP land cover map for a rapid ecological assessment of the Echo Henefer Wildlife Management Area.
- The Washington Department of Fish and Wildlife used GAP data to develop a breeding bird atlas and an atlas of mammals of Washington State.
- The Washington Department of Fish and Wildlife uses GAP data to operate an integrated landscape management program.
- The Washington Department of Fish and Wildlife uses GAP data from Eastern Washington to assist with an innovative program that brings the forest products industry, state agency biologists, non-government organizations, and tribal biologists together in the field to jointly determine the appropriate management practices for any particular site of concern (Timber, Fish & Wildlife Program).
- The Idaho Department of Fish and Game used GAP data to evaluate the impact from expanded military training activities on public lands in Southern Idaho.

- The Idaho Department of Fish and Game uses GAP data for regional planning efforts on a regular basis.

Statewide Planning:
Biodiversity planning programs or projects are now under way in Arizona, California, Colorado, Maine, Missouri, Nevada, Oregon, and Tennessee. It is likely that similar efforts will develop in other states. These activities were the subject of the State Biodiversity Programs meeting discussed on page _ in this report. In some cases, these efforts grew out of the state GAP project, however, in most cases, the GAP data are being used to meet a previously defined need. In all cases, GAP data are central to their development and operations. The goals of each of these programs or projects are presented briefly below.

Federal Agency Applications:
Some examples of applications of GAP data by federal agencies follow:
- GAP data are being supplied to all military installations in the Great Basin ecoregion for integrated management of the natural resources. These installations constitute a very large amount of land area. Much of it is of high value for native species.
- The Ouachita National Forest used the Arkansas GAP data to help them develop an ecosystem management plan.
- The Wyoming GAP data were used by NASA to calibrate a model that predicts vegetation types based on climate and soil variables.
- The potential contributions to biodiversity conservation of four different options proposed for new wilderness designation in Idaho were quantified by the Idaho Cooperative Fish and Wildlife Research Unit in cooperation with the Park Studies Unit.
- The potential contributions to biodiversity conservation of four different options proposed for new national park designation in Idaho were quantified by the Idaho Cooperative Park Studies Unit.
- The U.S. Forest Service in Booneville, Arkansas, used the Arkansas GAP data land cover maps in a 3-dimensional presentation to provide the public with a visual representation of the region and to enhance the public's involvement with the National Forest planning process.
- The U.S. Fish and Wildlife Service regularly uses the GAP data for Southern California for habitat evaluation and management.
- The U.S. Forest Service, Bureau of Land Management, and National Park Service are using the GAP data for a wide variety of natural resource management operations in Utah. For example, the entire Utah GAP database is directly linked with existing National Park Service databases for use by National Parks.
- The Bureau of Land Management uses the Wyoming GAP data for managing the Buffalo Resource Area.
- The U.S. Forest Service used the Utah GAP data to help assist them in evaluating human-induced impacts to forested lands surrounding ski resorts in central Utah.
- The U.S. Fish and Wildlife Service in Delaware used GAP data to help identify potential habitat for the federally endangered Delmarva fox squirrel. These maps

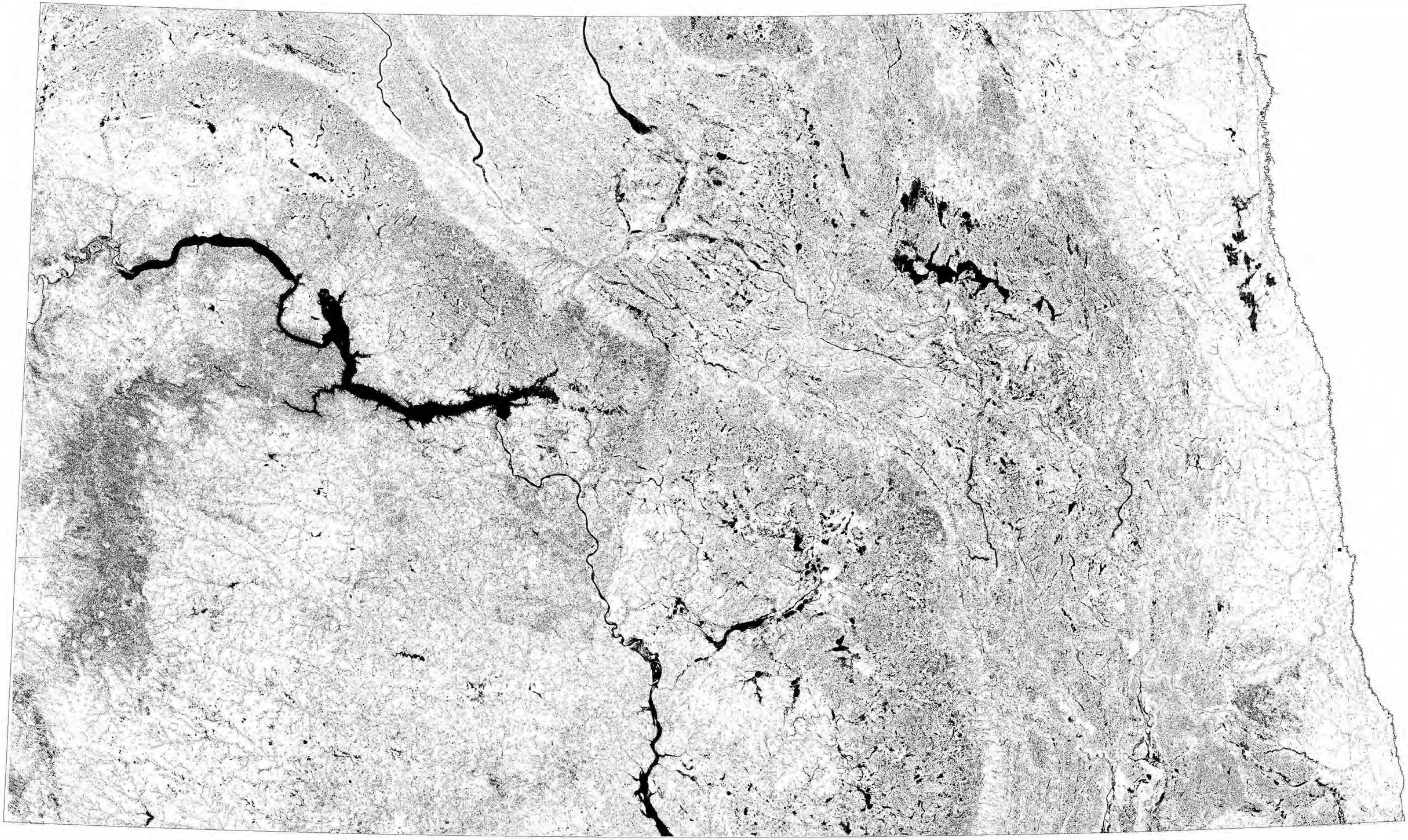
were displayed and served as a catalyst for bringing together people with a stake in the issue.

- The U.S. Fish and Wildlife Service used the Indiana GAP data as part of a biological assessment for the base closure of the Jefferson Proving Grounds and its conversion to a National Wildlife Refuge. This 58,000-acre installation has restricted human access due to unexploded ordinance and contains some of the highest-quality natural habitat in Indiana.
- The U.S. Fish and Wildlife Service in Louisiana used GAP data to avoid conflict over the designation of critical habitat of the federally endangered Louisiana black bear.
- The NOAA Coastal Marine Sanctuary in Washington State uses GAP data for an educational display.
- In Washington and New Mexico, digital land cover maps have been distributed to all National Forests.
- The U.S. Natural Resources Conservation Service (NRCS) in New Mexico is using a GAP clustered imagery as a base for their land cover mapping activities.
- The Department of Defense is funding the development of an electronic environmental information system for the Mojave ecoregion, which would use GAP data as a foundation or base layer of information. The system will link 29 DoD installations to a common source of environmental information.

<u>North Dakota Applications</u>

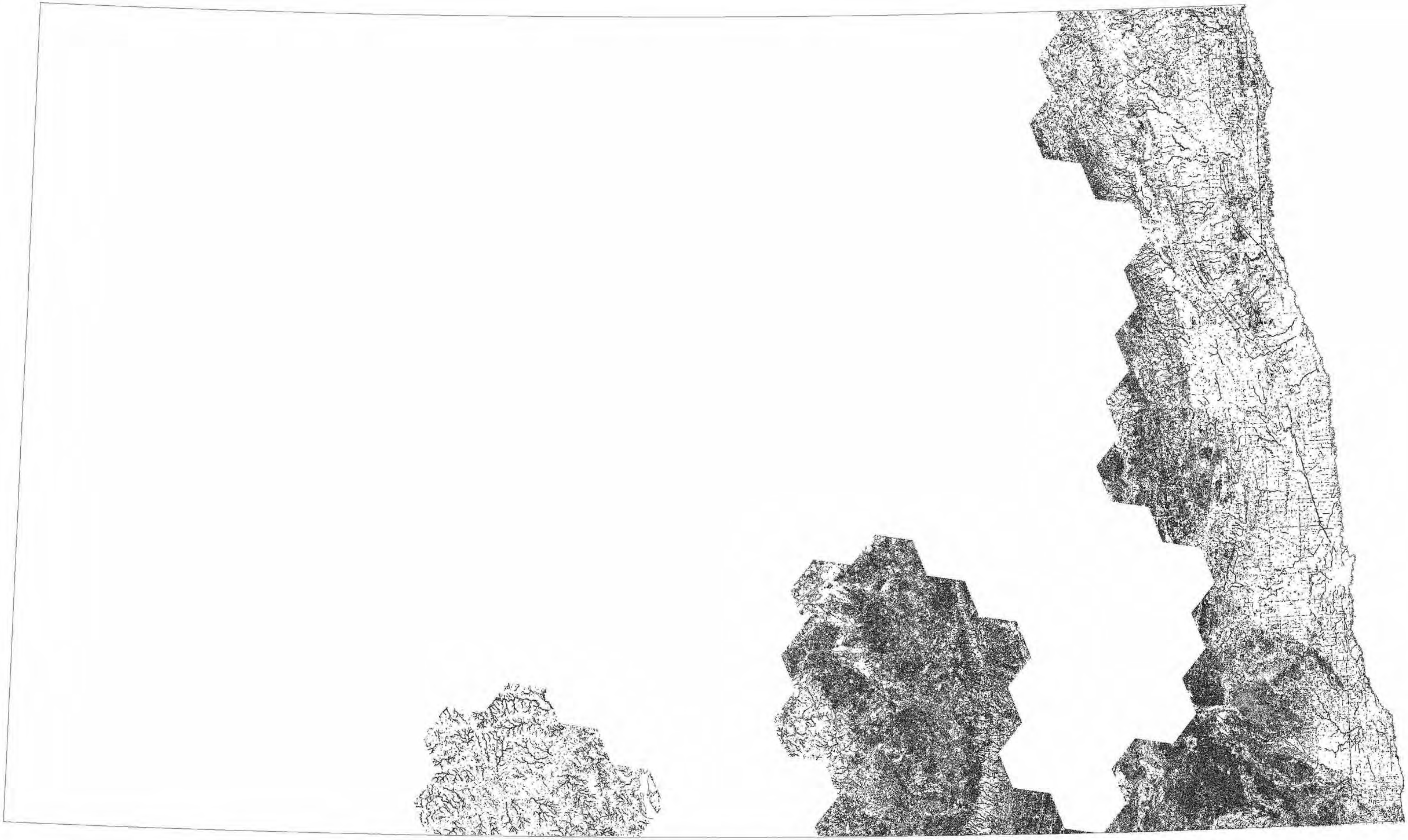
- The ND-GAP land cover data is used by USFWS Private Land biologists to evaluate the land cover composition of watersheds for proposed wetland creations.
- The ND-GAP land cover data was used by USGS wildlife biologists in the design of a survey for Richardson's ground squirrels.
- The ND-GAP land cover data is used by North Dakota Game and Fish Department biologists to evaluate land cover composition for a variety of planning purposes including ND's Comprehensive Wildlife Conservation Strategy.
- The ND-GAP land cover data is used by the ND Natural Resources Conservation Service for watershed planning purposes.
- The ND-GAP land cover data is used by the U.S. Forest Service Fire Sciences Laboratory in a national fire regime and vegetation mapping project.
- The ND-GAP vertebrate data was used by EPA region 7 and the Missouri Resource Assessment Partnership as one input to Cplan, a reserve design algorithm, as part of the EPAs Critical Ecosystems program.
- The ND-GAP vertebrate data was used by University of Illinois researchers investigating deer ticks and Lyme disease for the Center of Disease Control.
- The ND-GAP vertebrate data was used by biologists preparing a book on the mammals of ND.
- The ND-GAP stewardship data was used by South Dakota State University in the Upper Missouri River Aquatic Gap Project.

Tiger Salamander(Ambystoma tigrinum

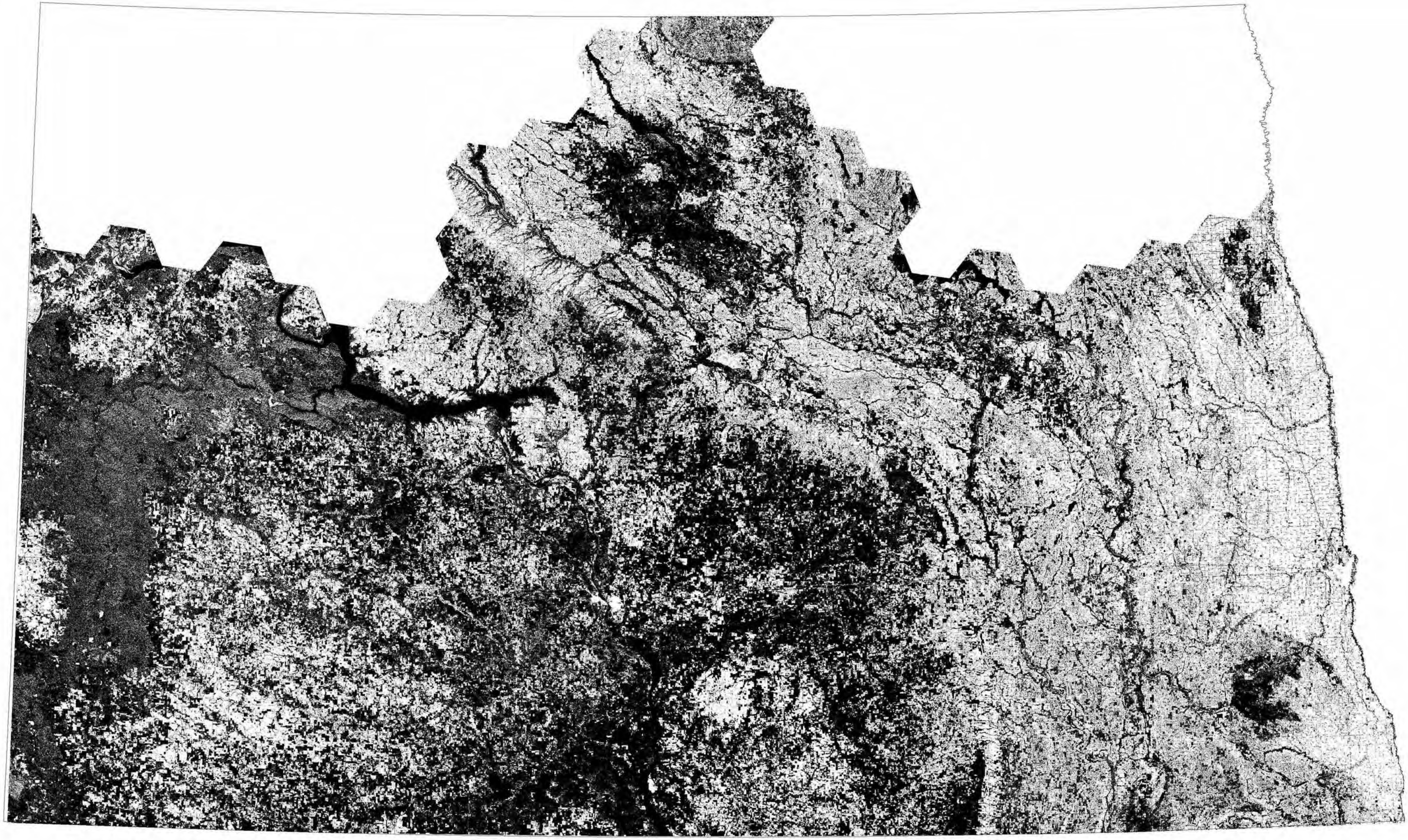


Common Mudpuppy(Necturus maculosus)

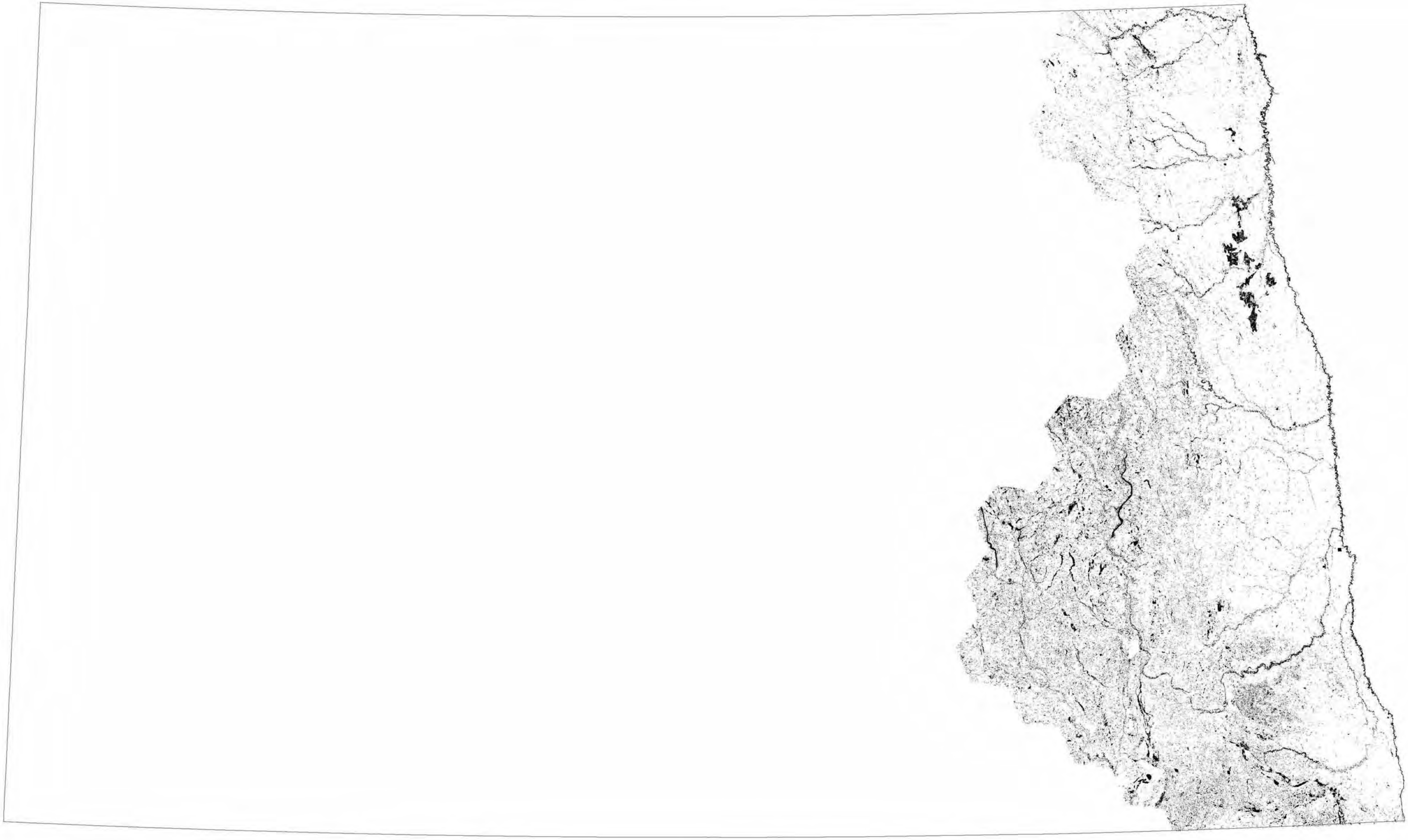
American Toad(Bufo americanus)



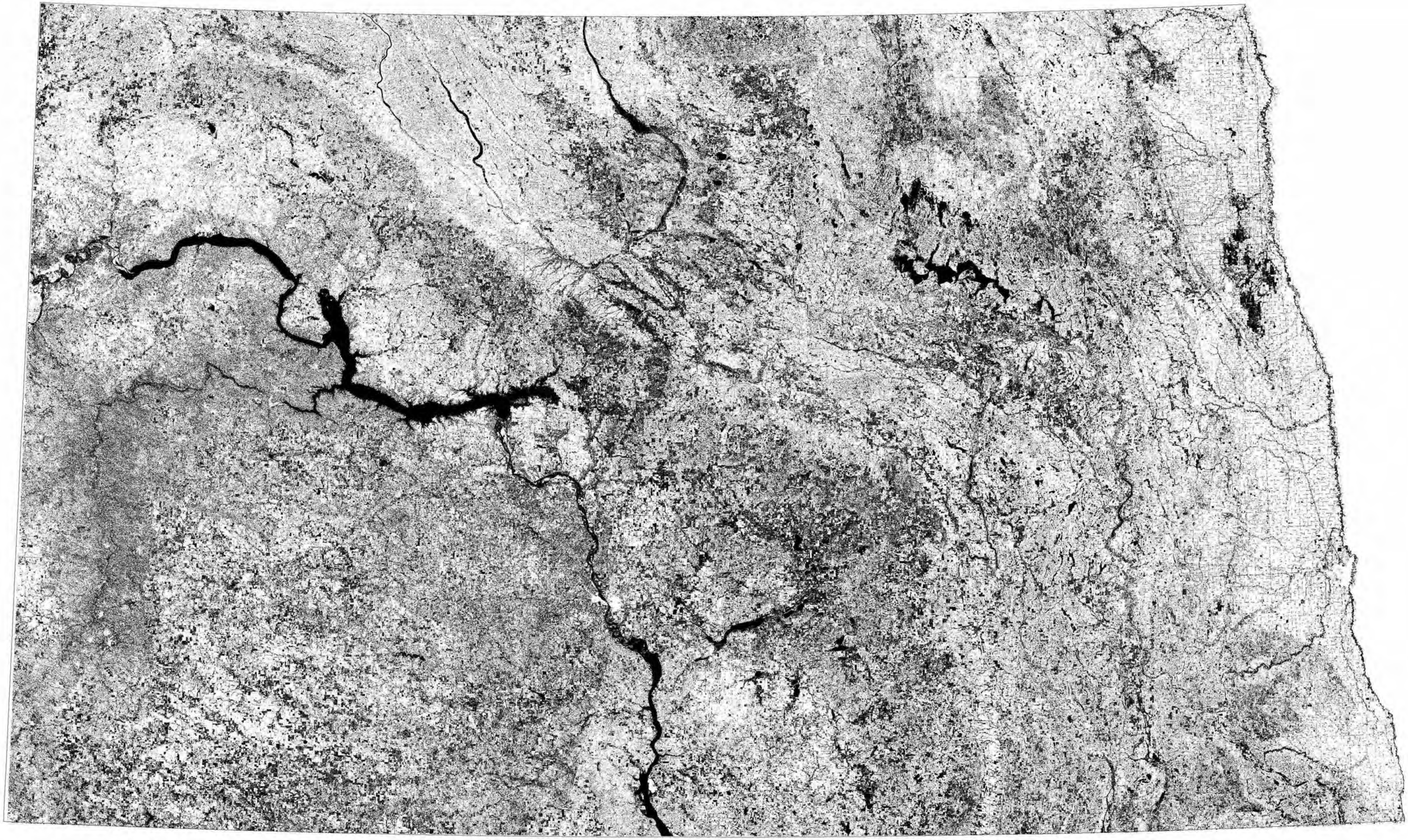
Great Plains Toad(Bufo cognatus)



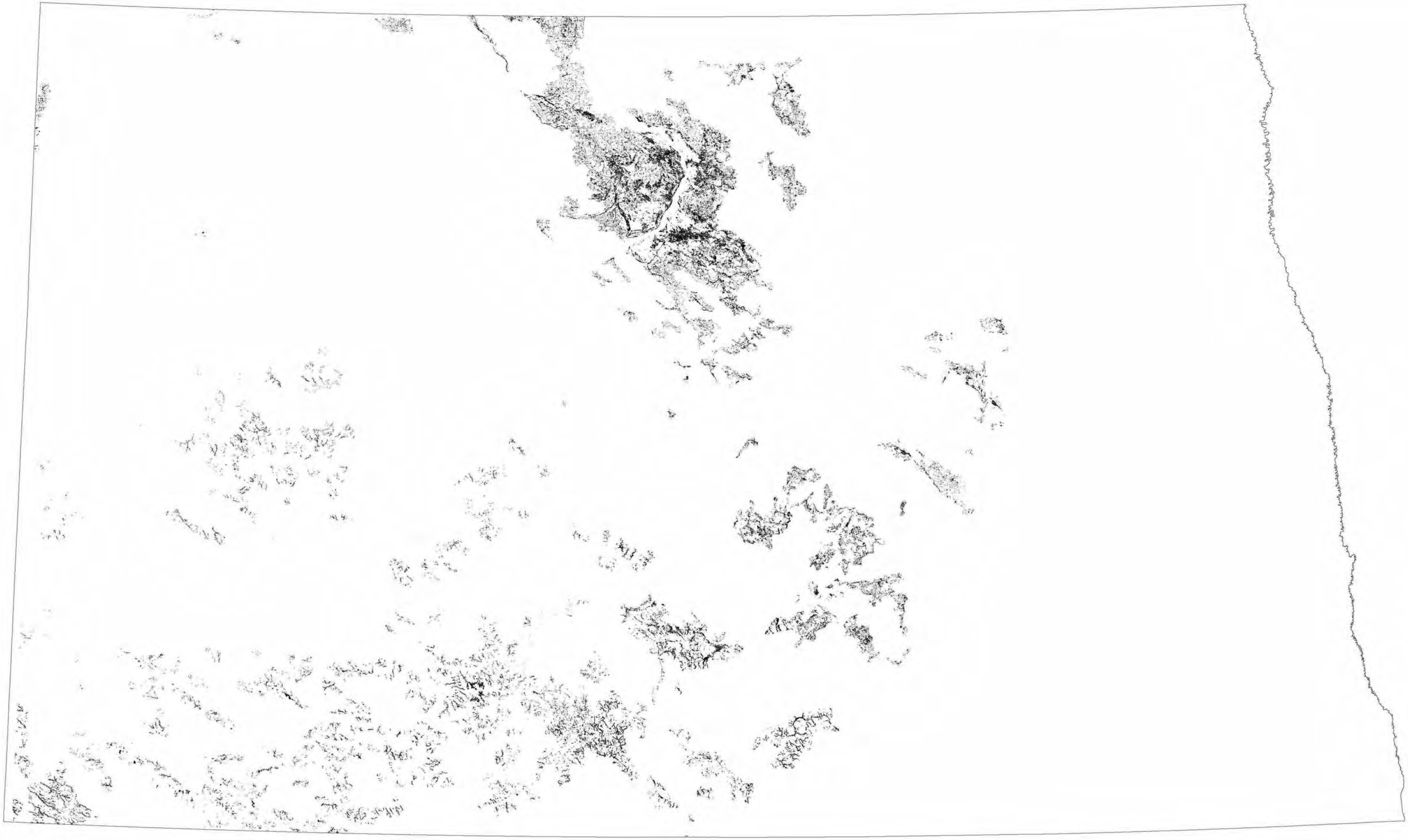
Gray Treefrog/Cope's(Hyla versicolor/chrysoscelis)



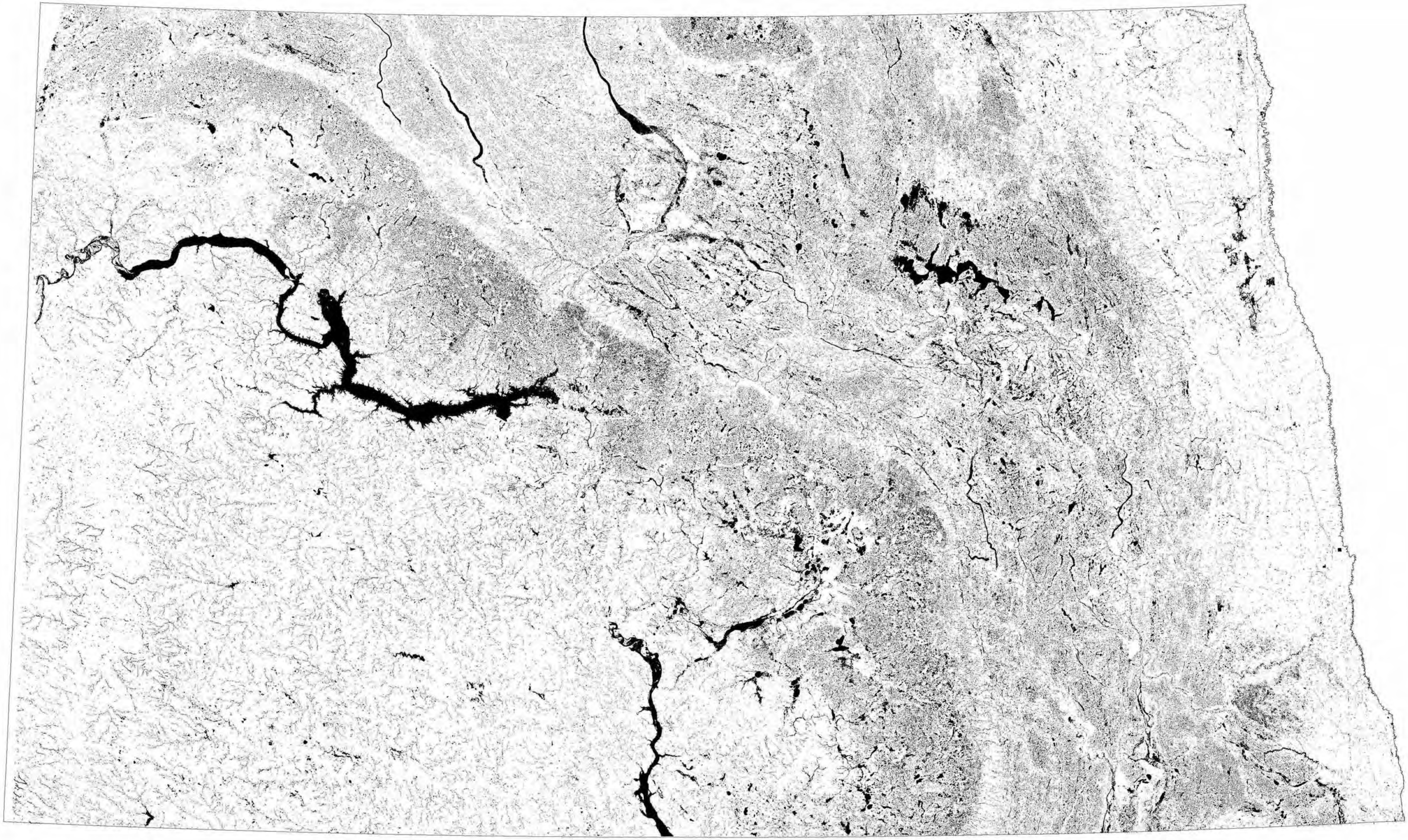
Boreal Chorus Frog(Pseudacris triseriata maculata)



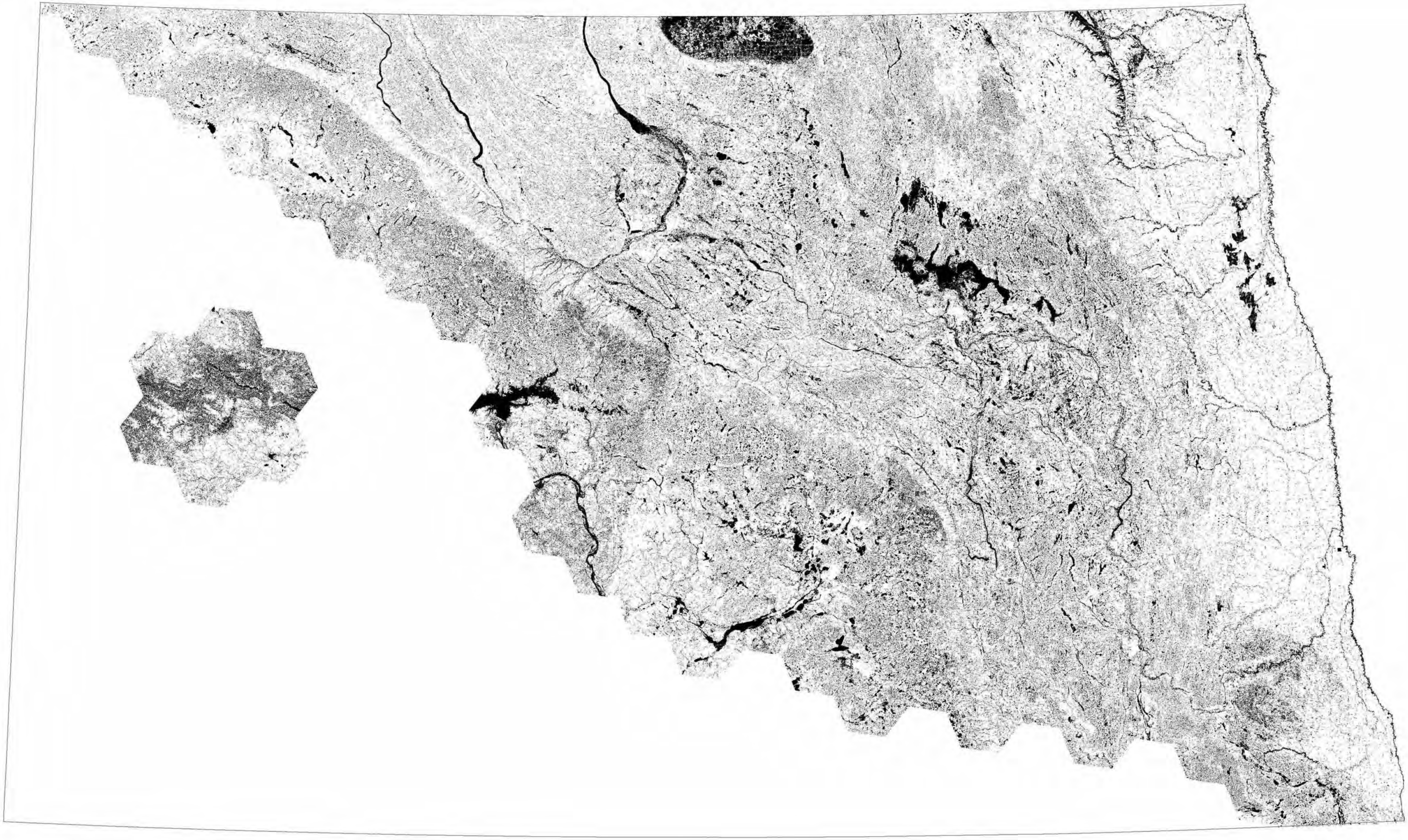
Plains Spadefoot Toad(Scaphiopus bombifrons)



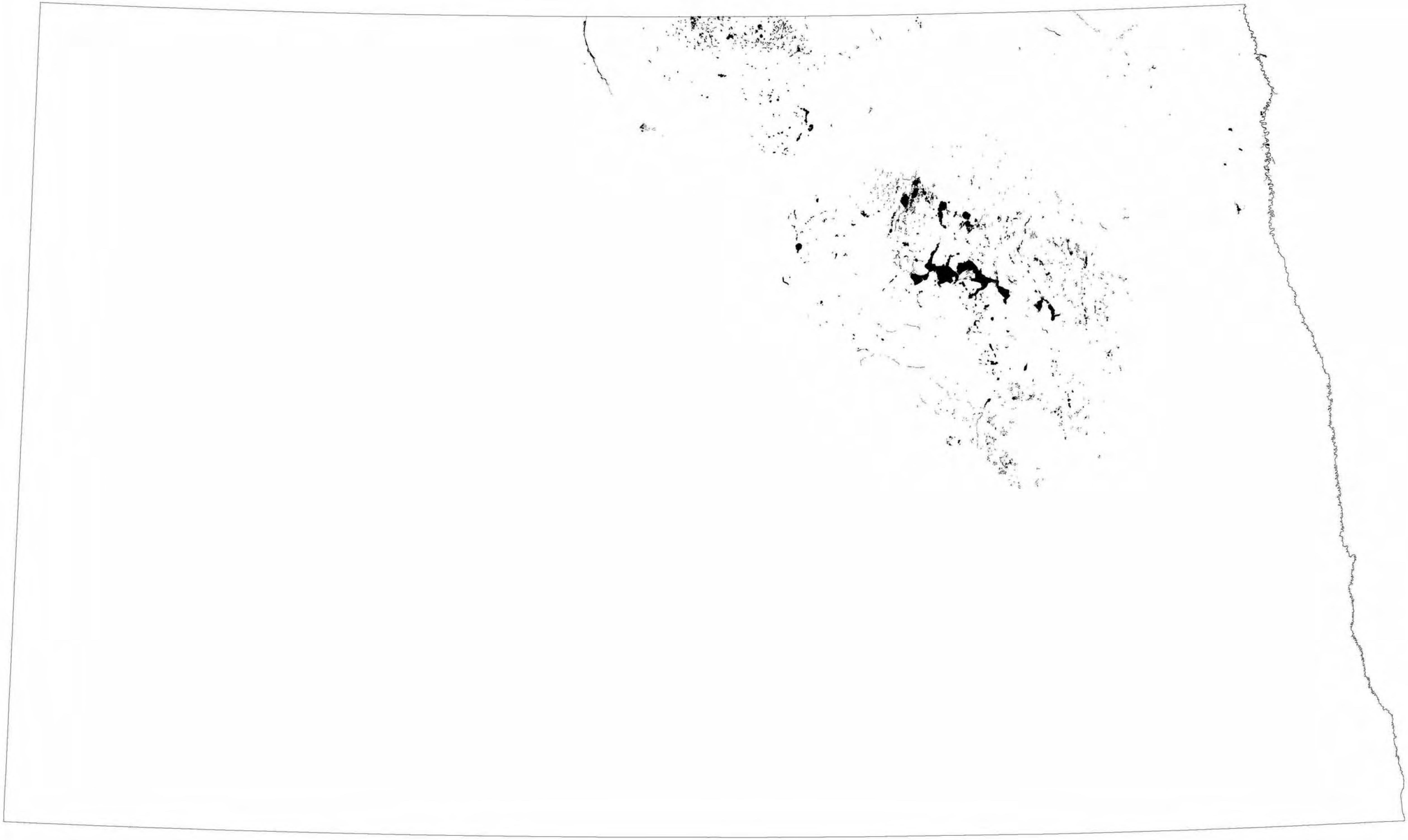
Northern Leopard Frog(Rana pipiens)



Wood Frog(Rana sylvatica)

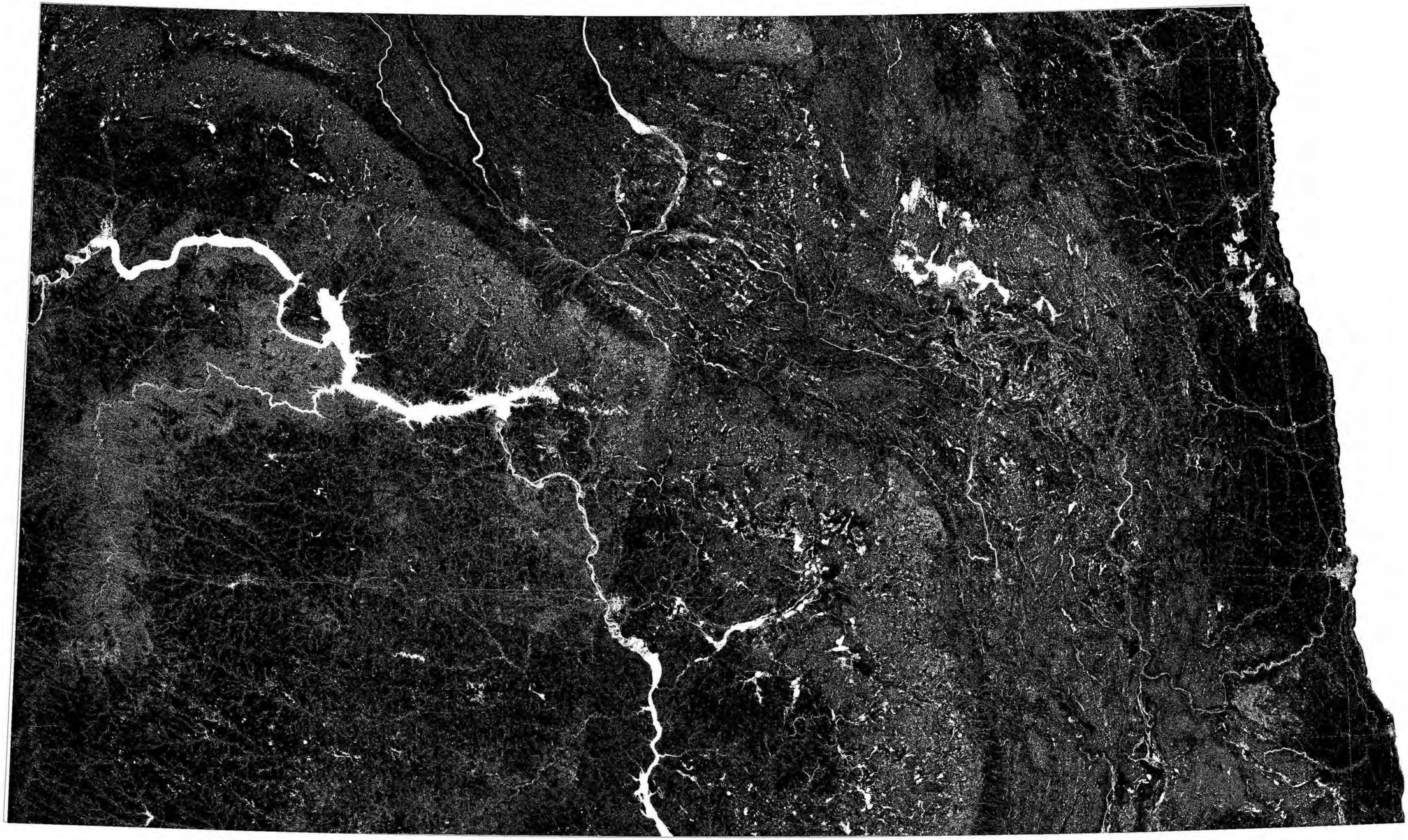


COMMON LOON(Gavia immer)

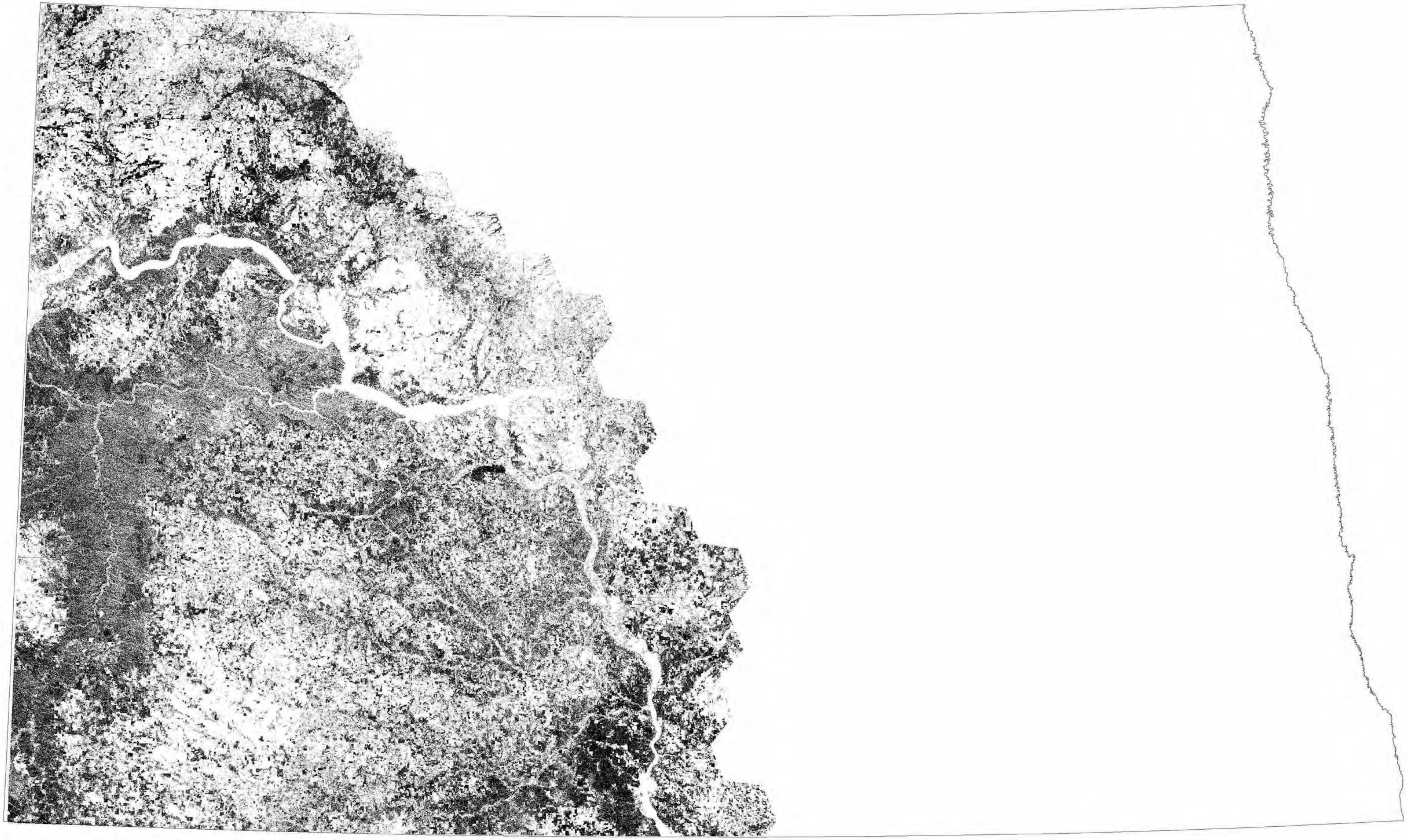


MERLIN(Falco columbarius)

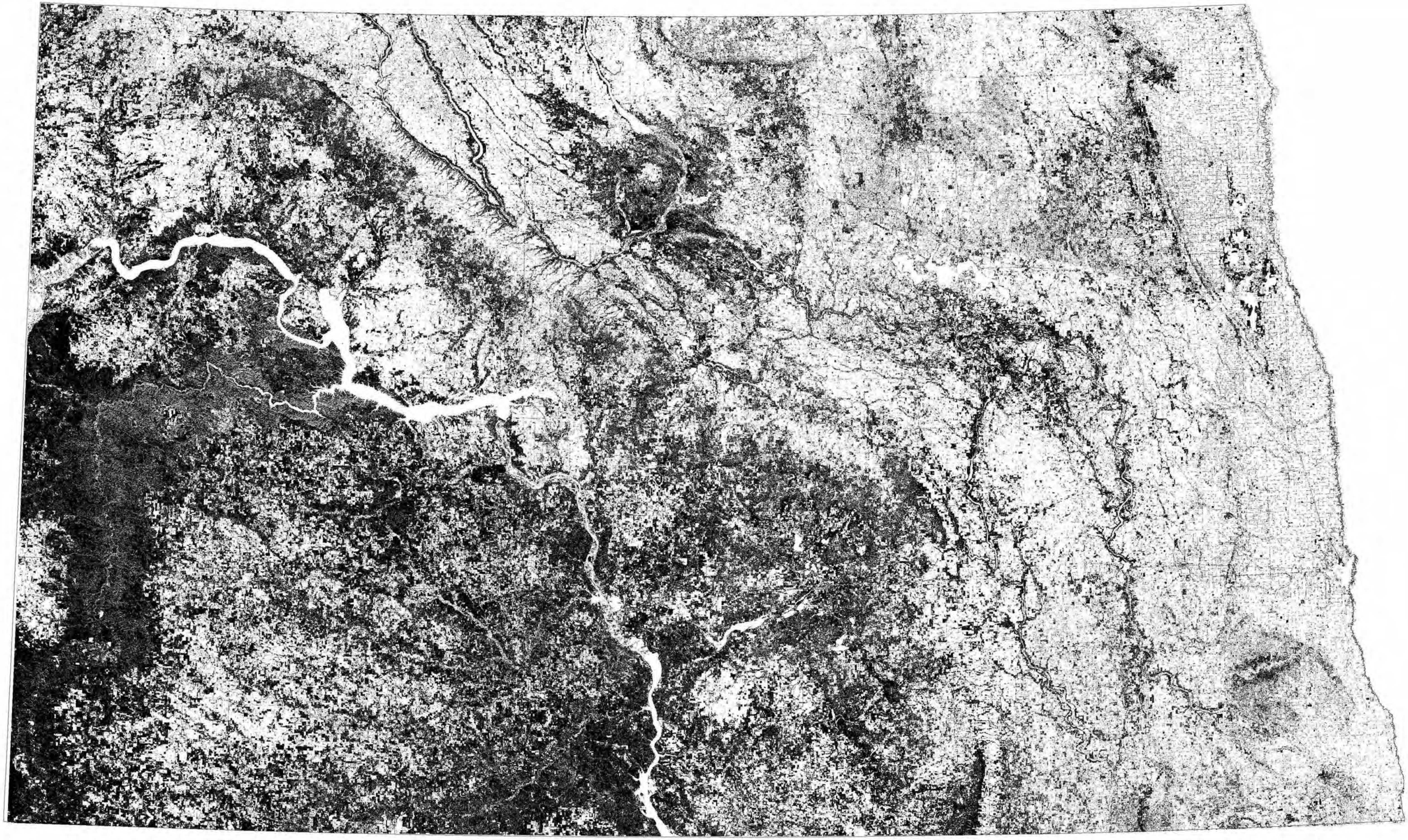
AMERICAN KESTREL(Falco sparverius)



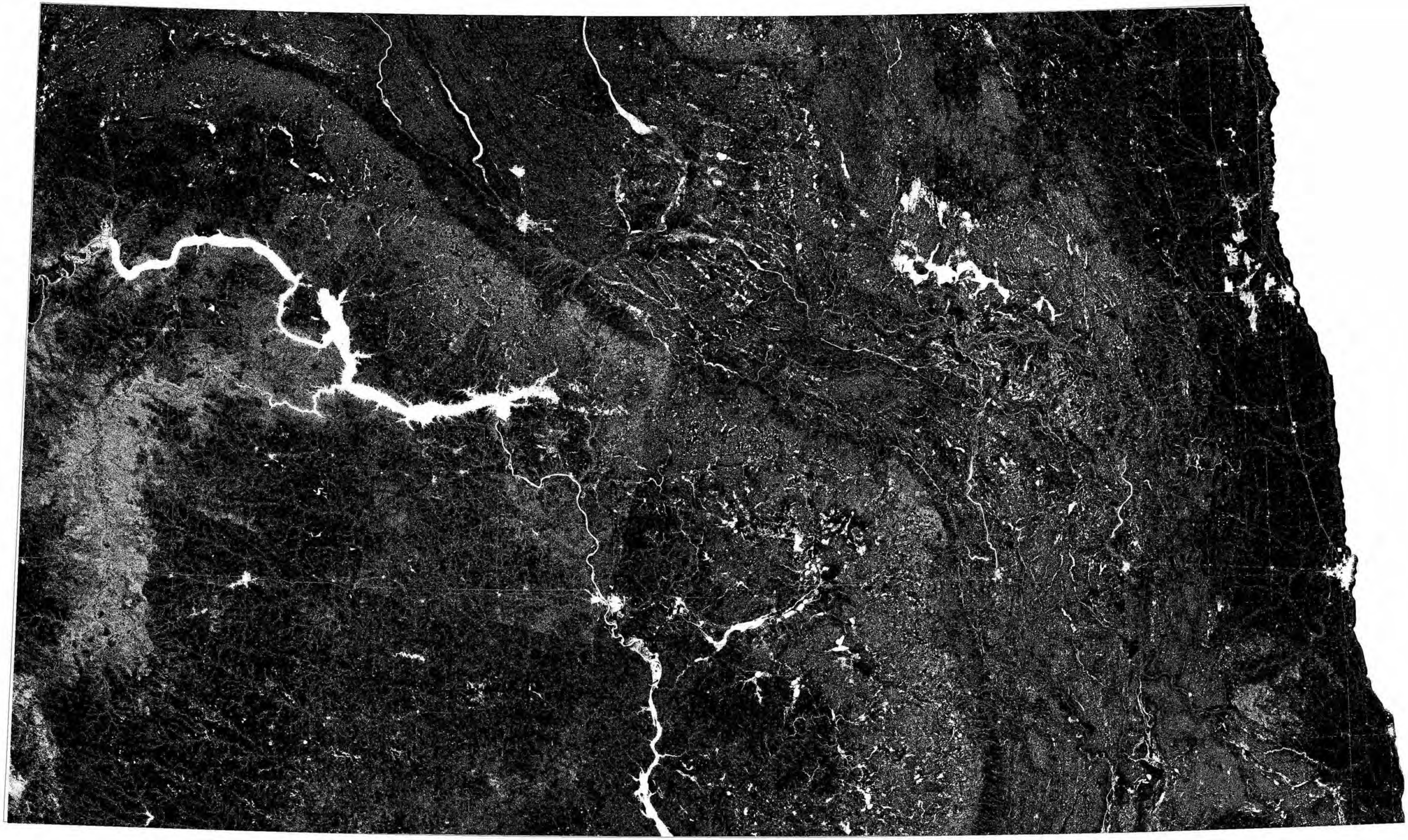
GOLDEN EAGLE(Aquila chrysaetos)



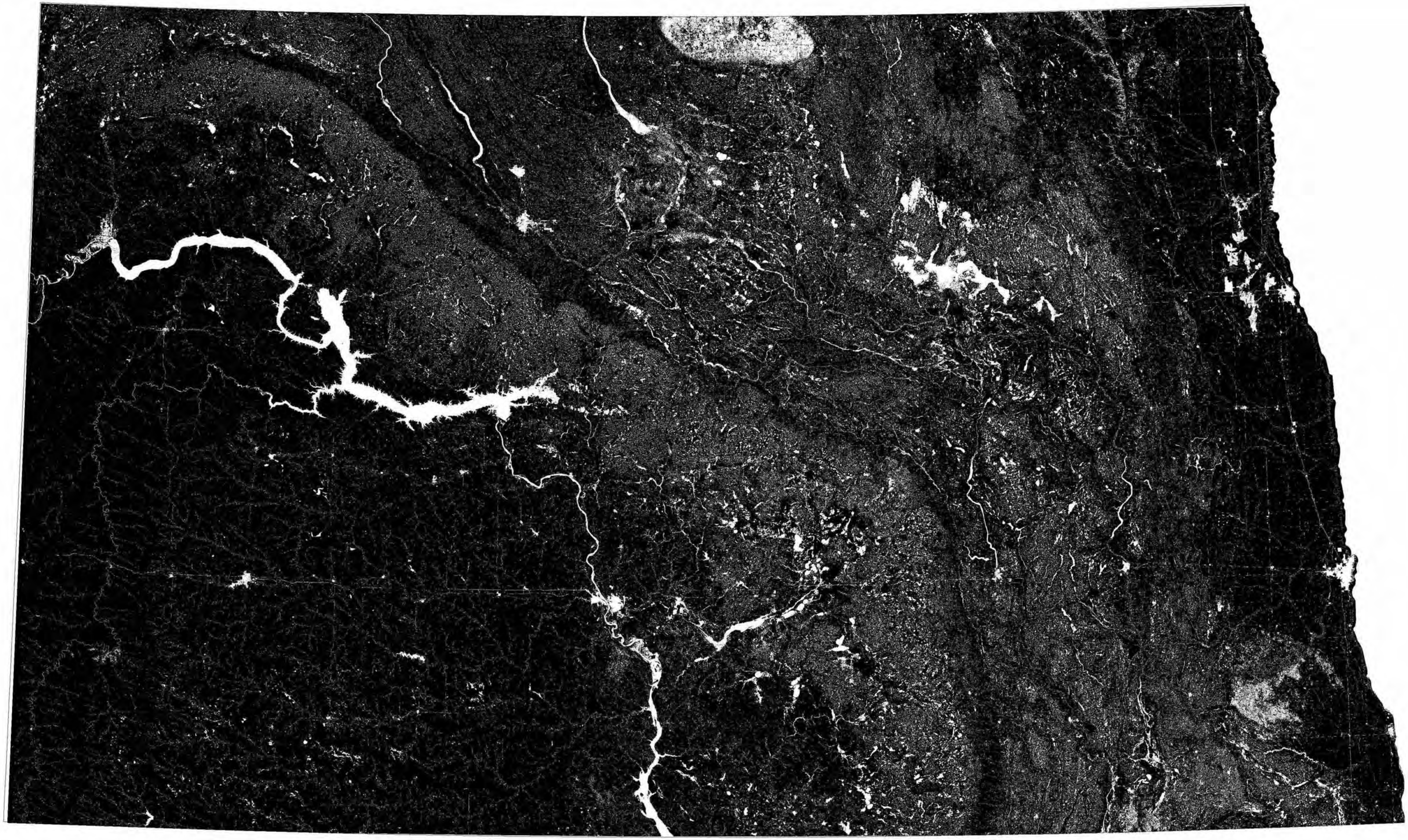
FERRUGINOUS HAWK(Buteo regalis)



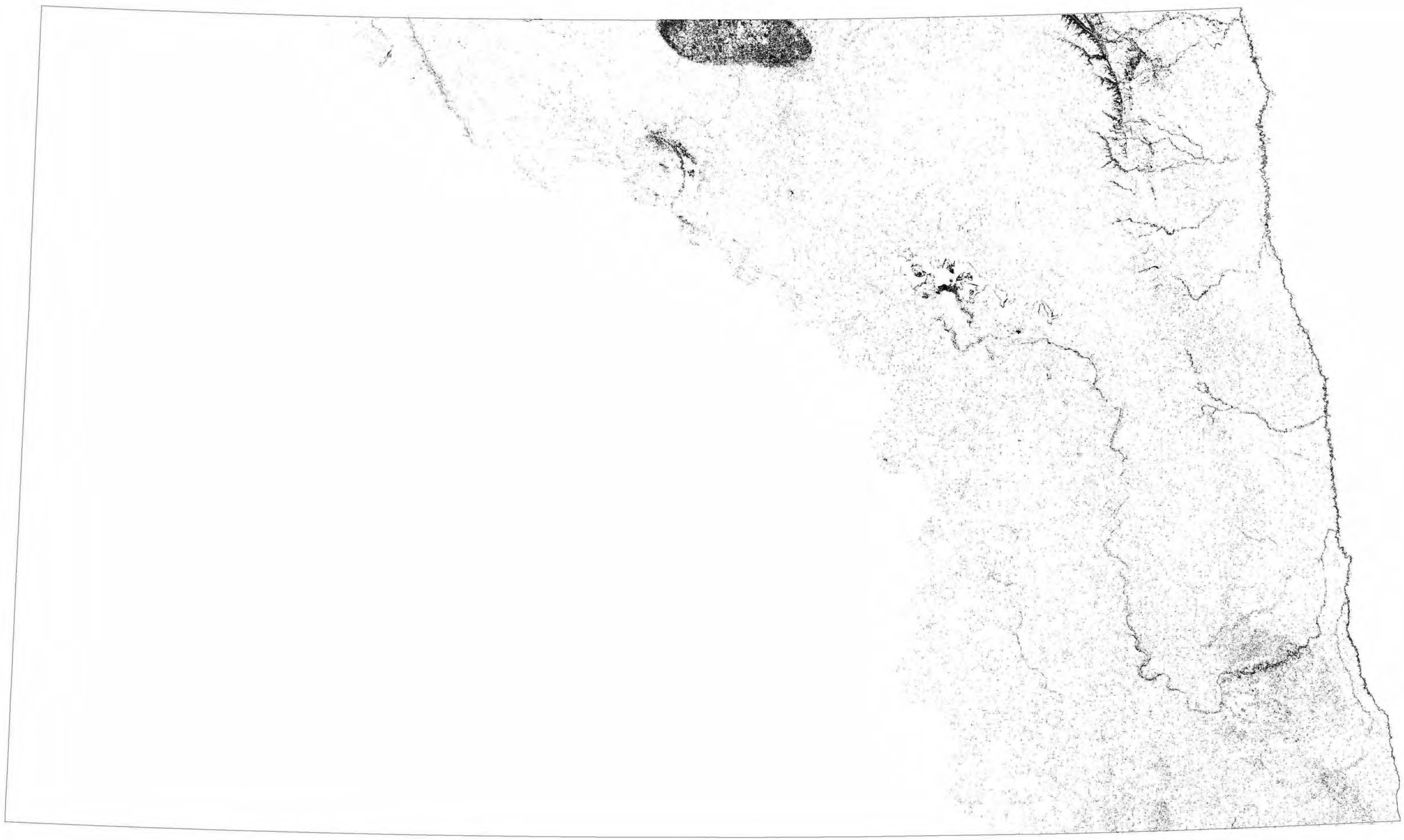
RED-TAILED HAWK(Buteo jamaicensis)



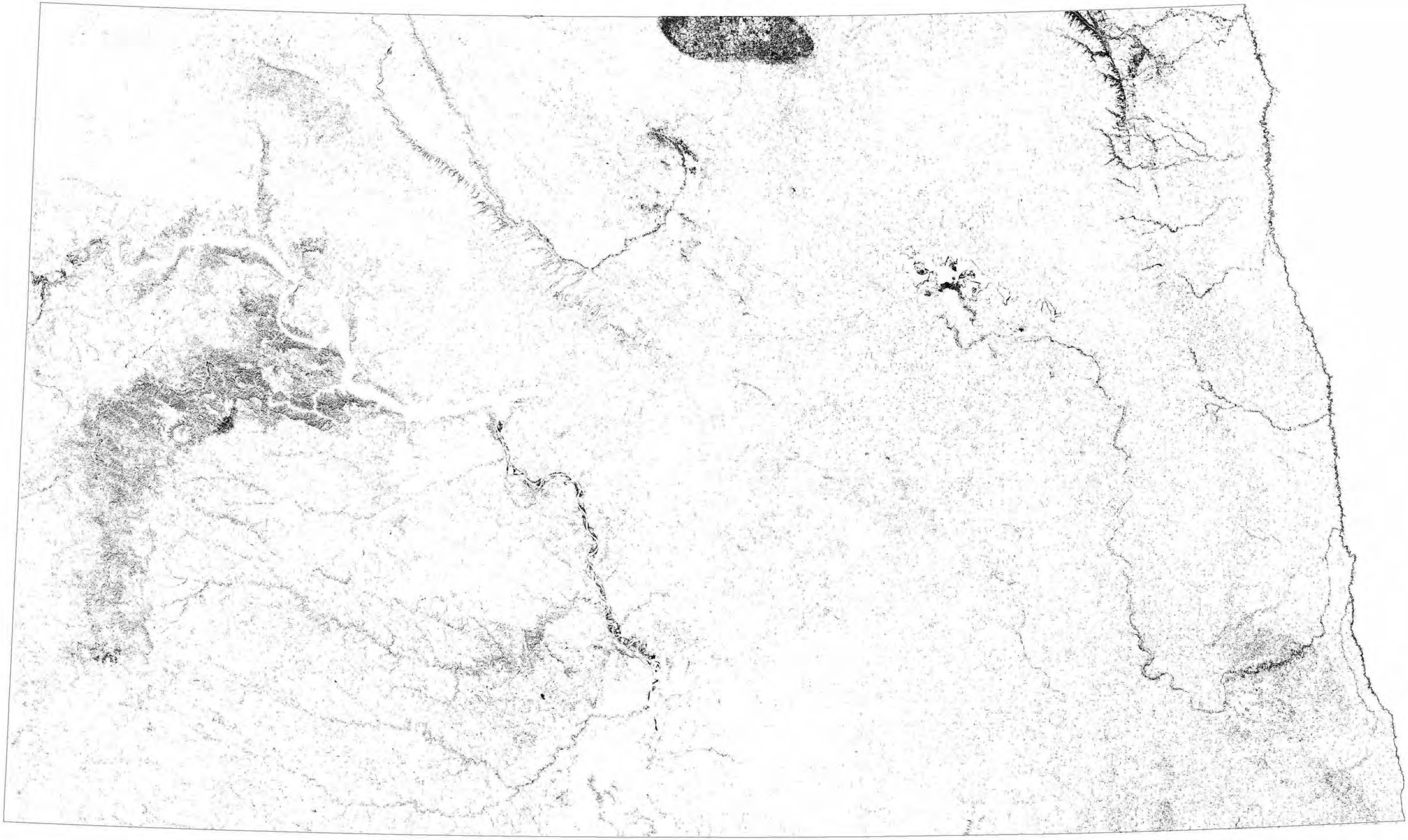
SWAINSON'S HAWK(Buteo swainsoni)



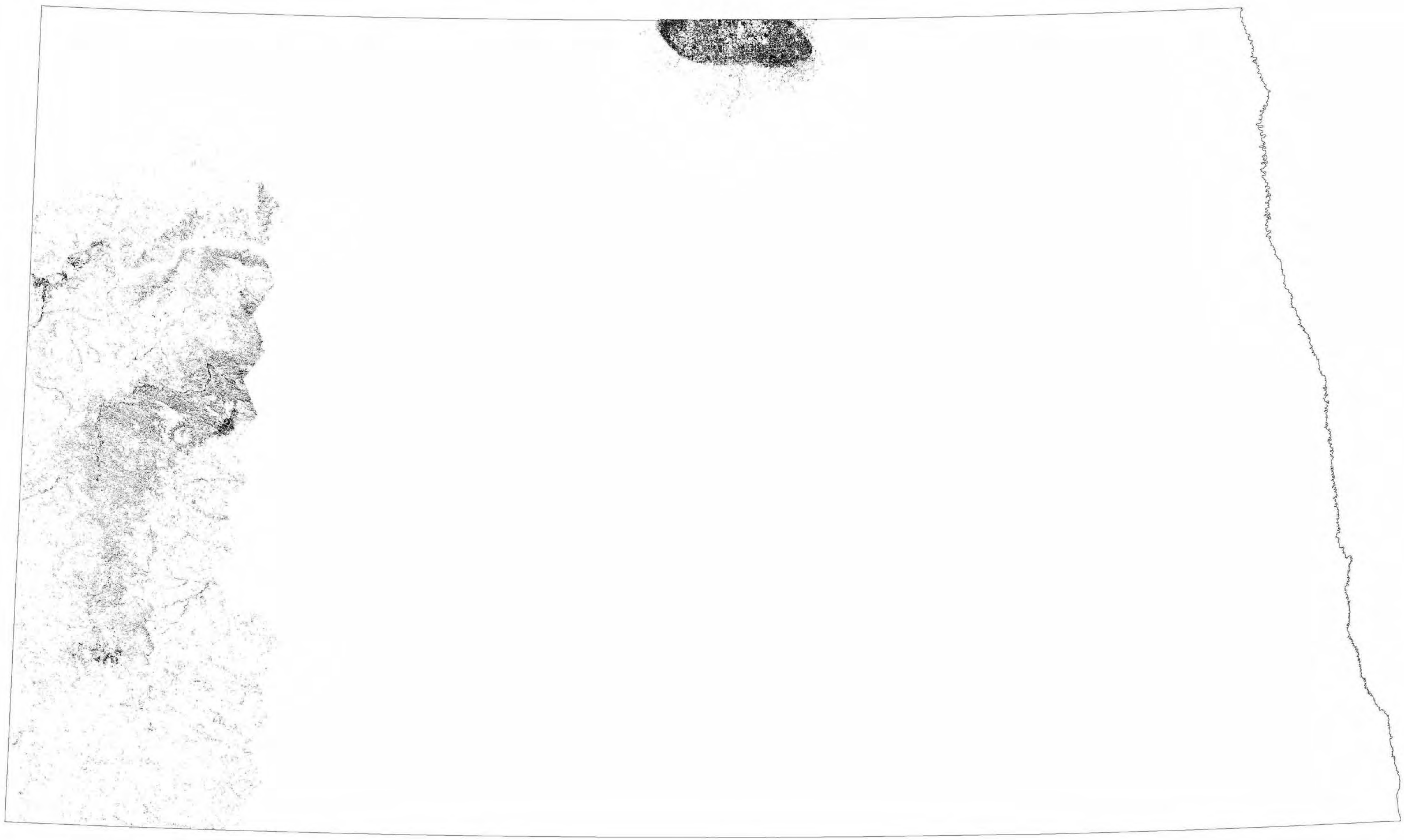
BROAD-WINGED HAWK(Buteo platypterus)



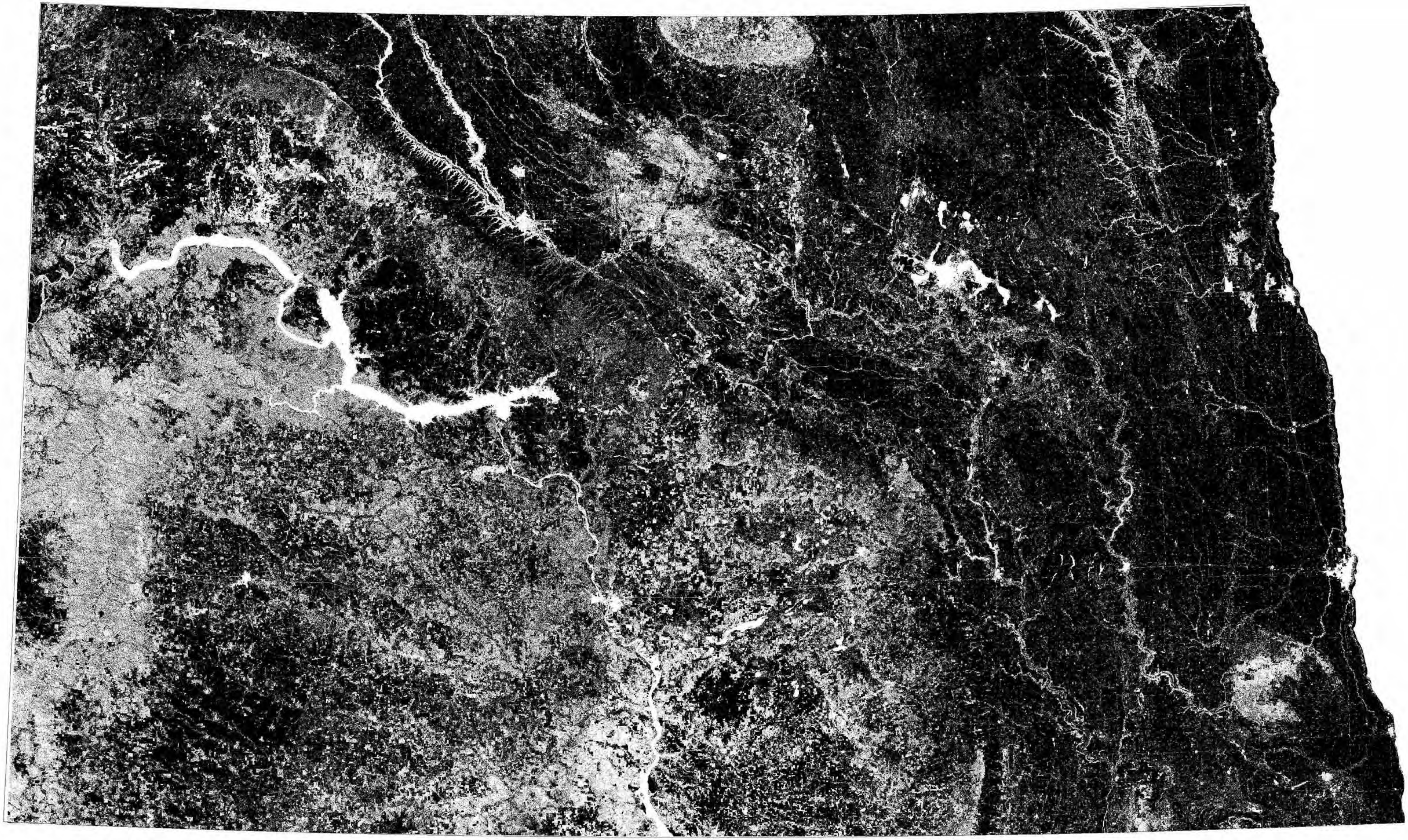
COOPER'S HAWK(Accipiter cooperii)



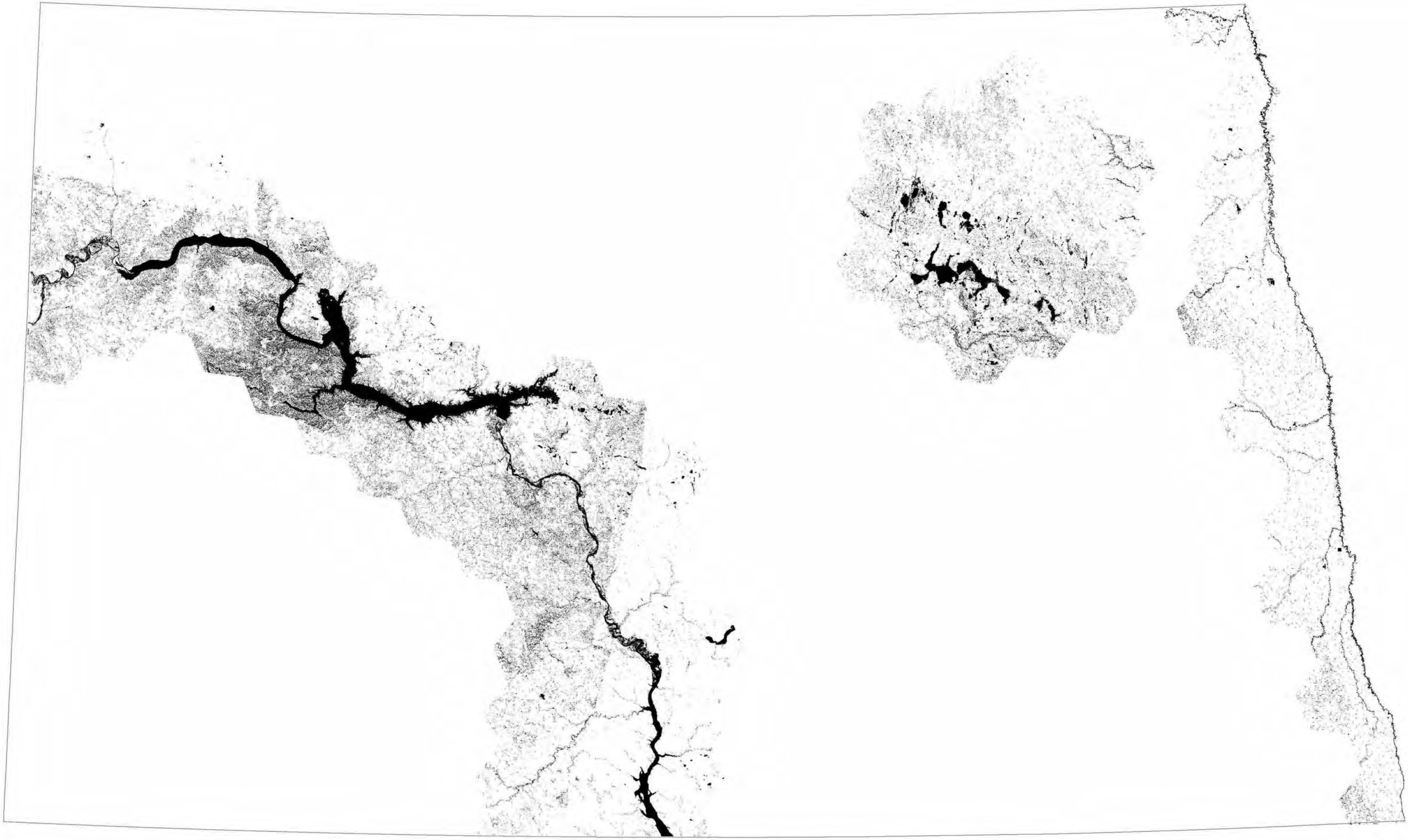
SHARP-SHINNED HAWK(Accipiter striatus)



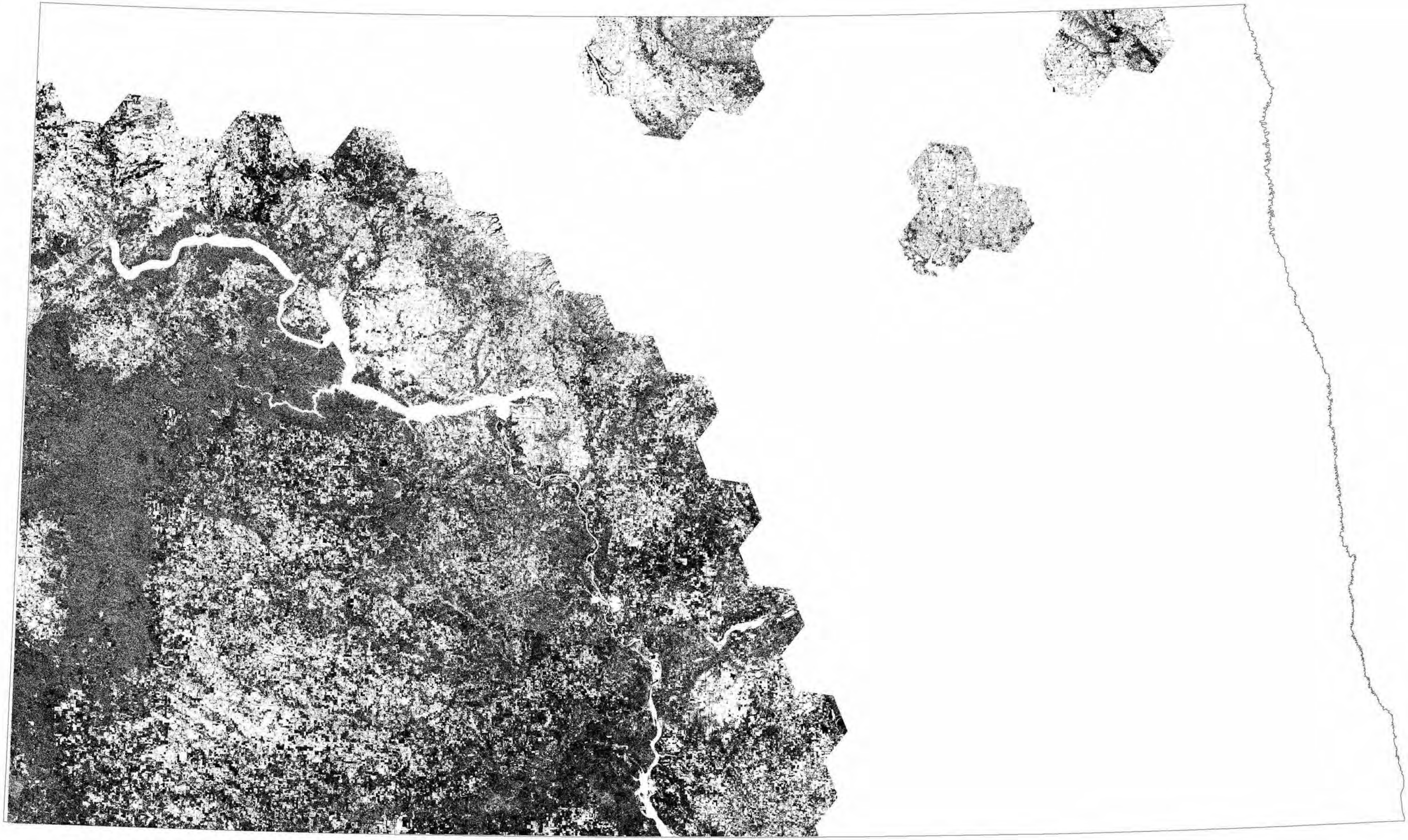
NORTHERN HARRIER(Circus cyaneus)



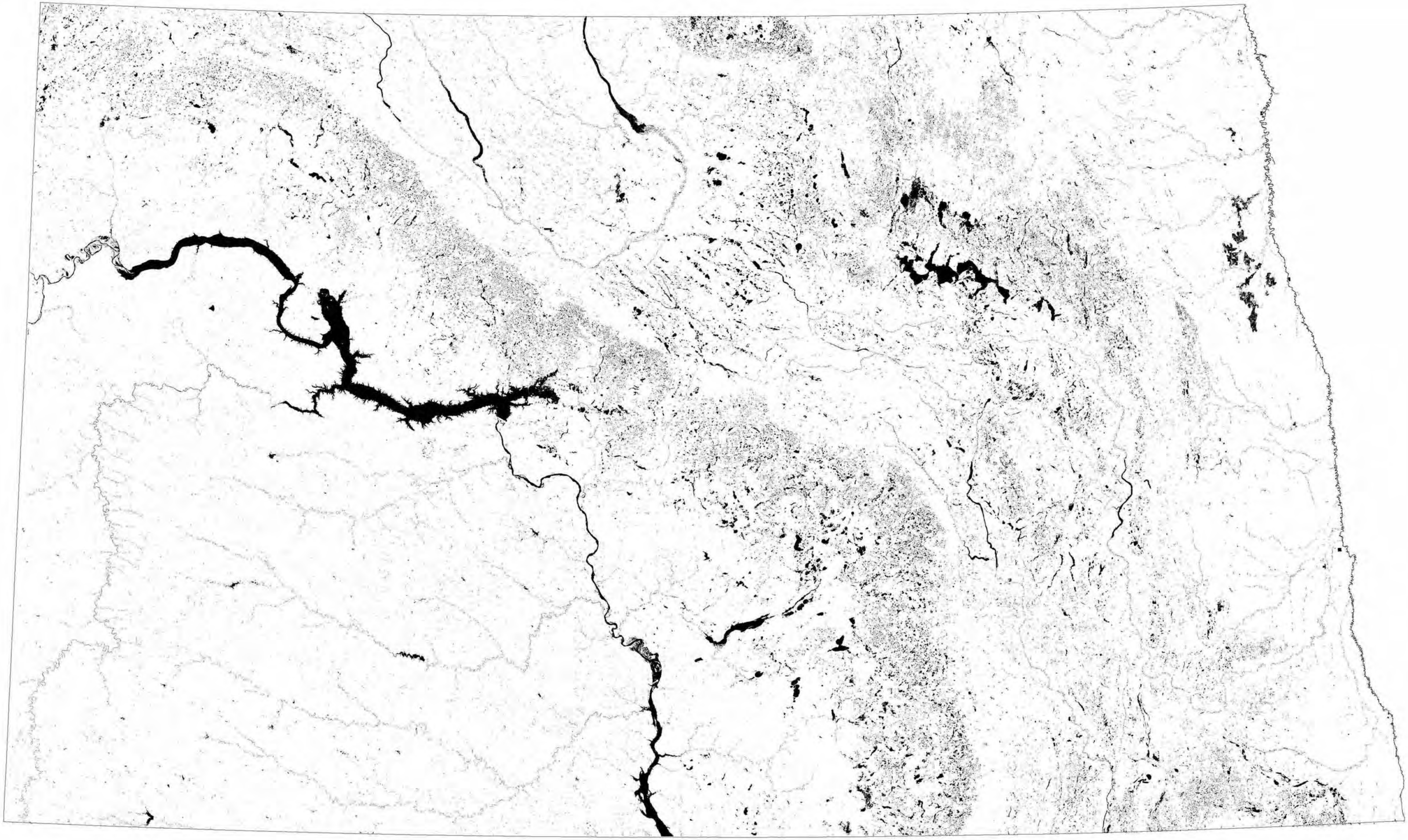
BALD EAGLE(Haliaeetus leucocephalus)



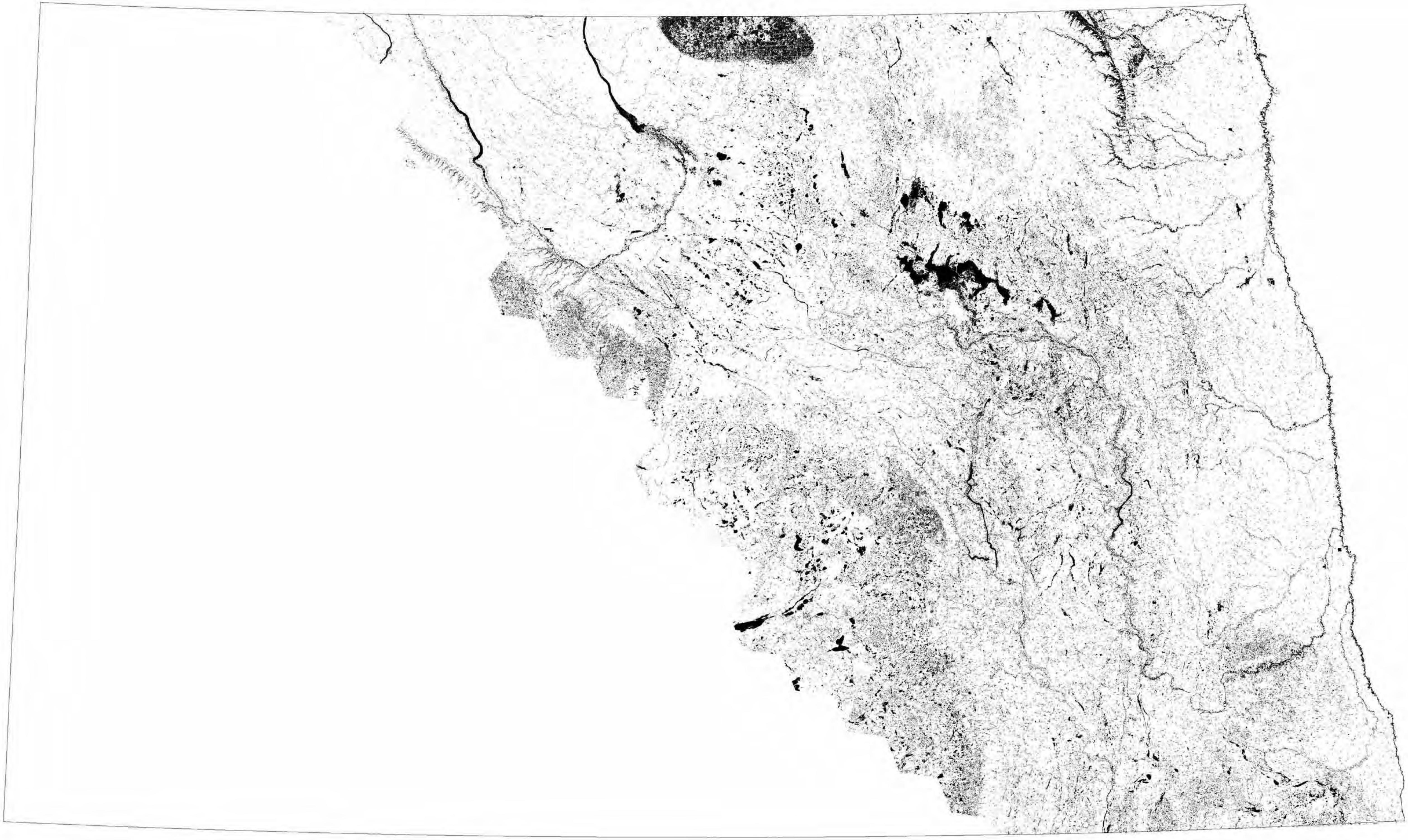
TURKEY VULTURE(Cathartes aura)



RUDDY DUCK(Oxyura jamaicensis)

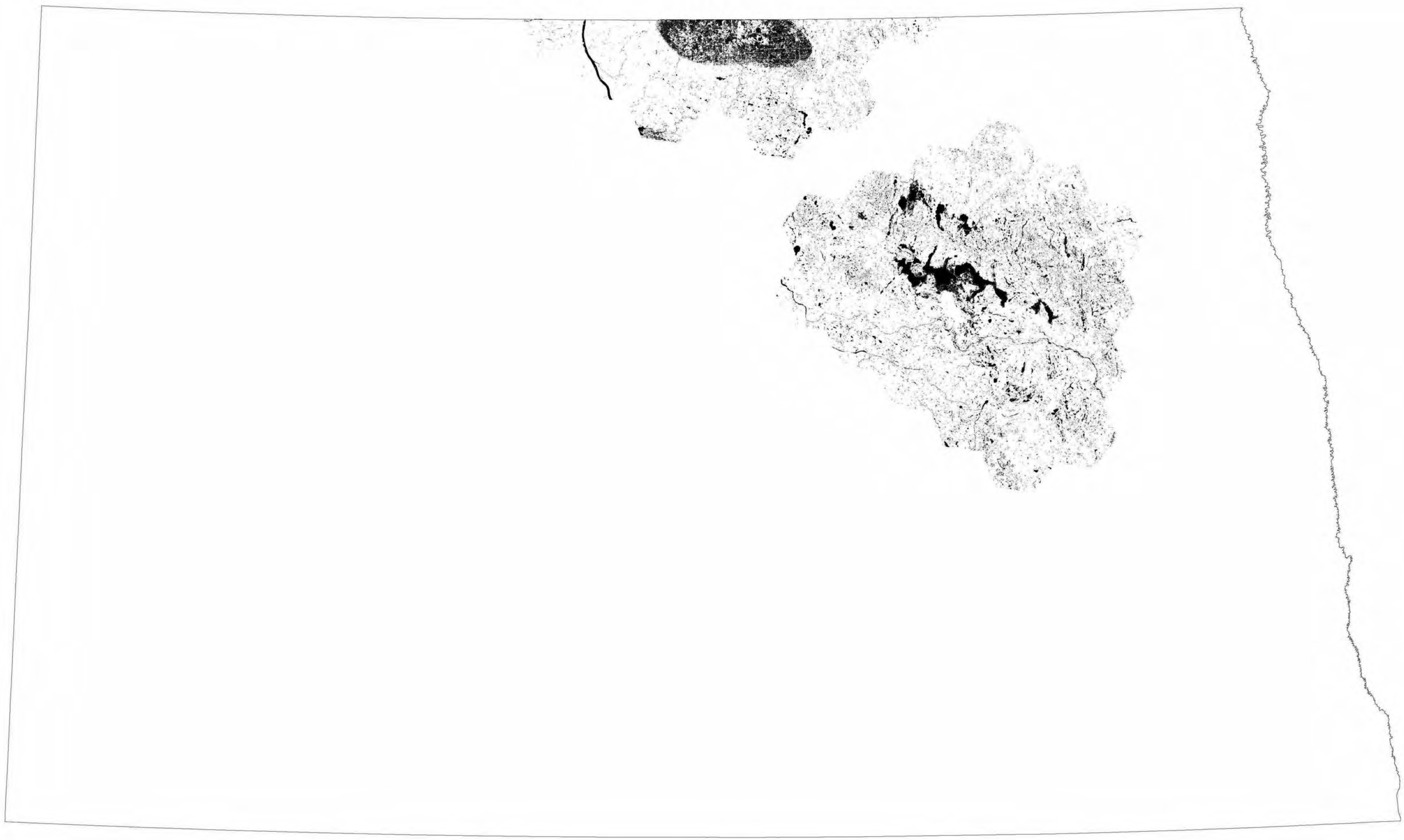


NORTHERN SHOVELER(Anas clypeata)



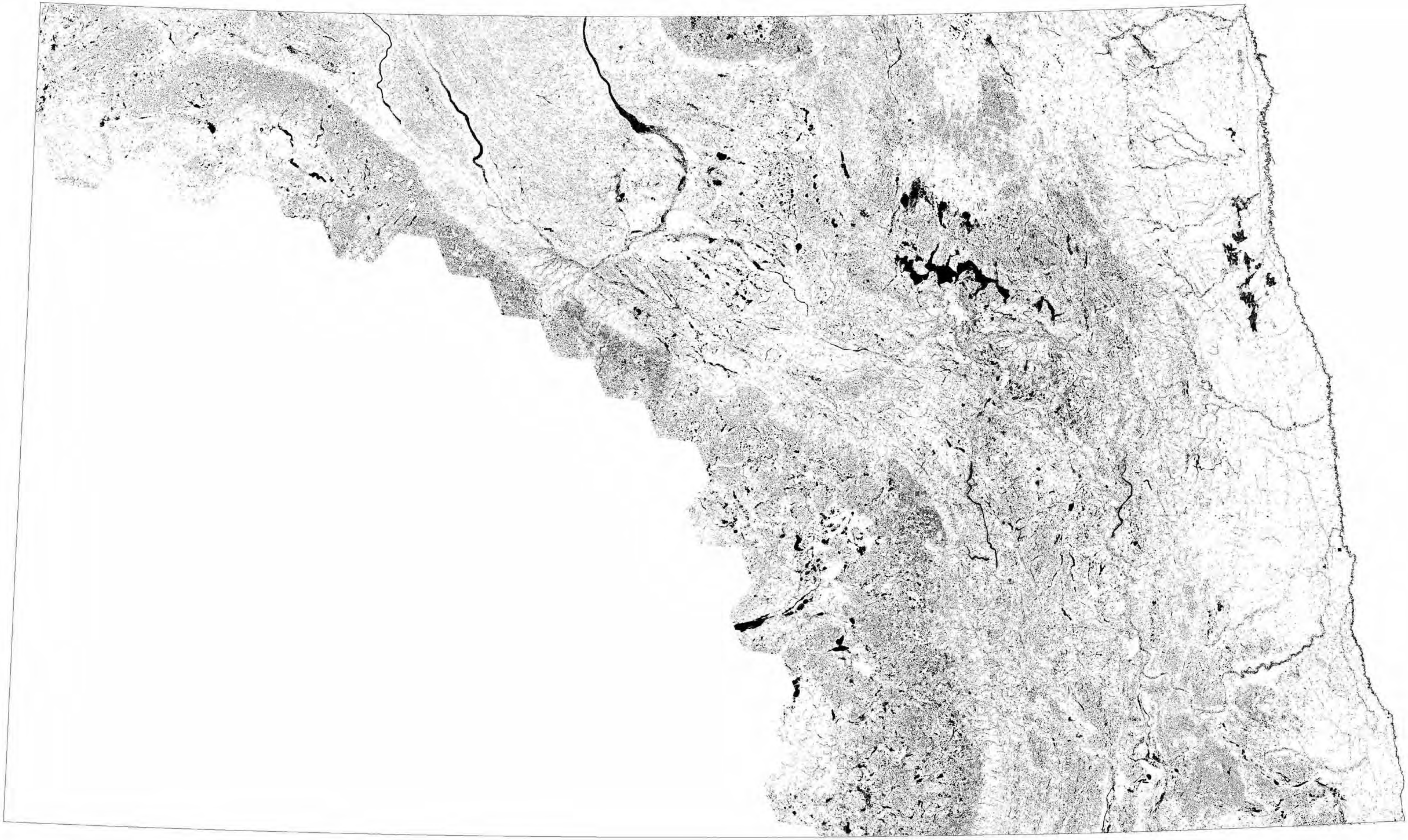
BUFFLEHEAD(Bucephala albeola)

COMMON GOLDENEYE(Bucephala clangula)

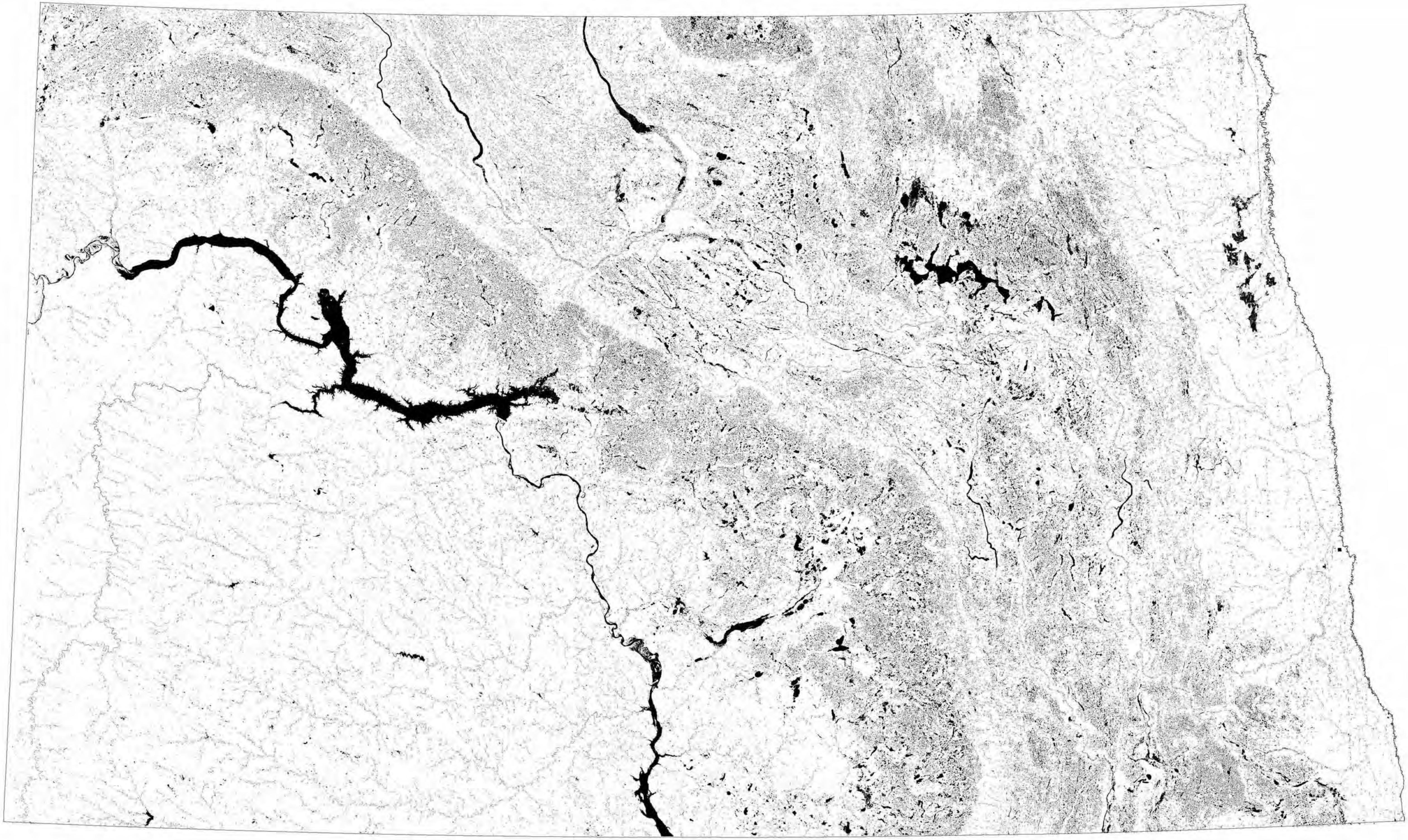


LESSER SCAUP(Aythya affinis)

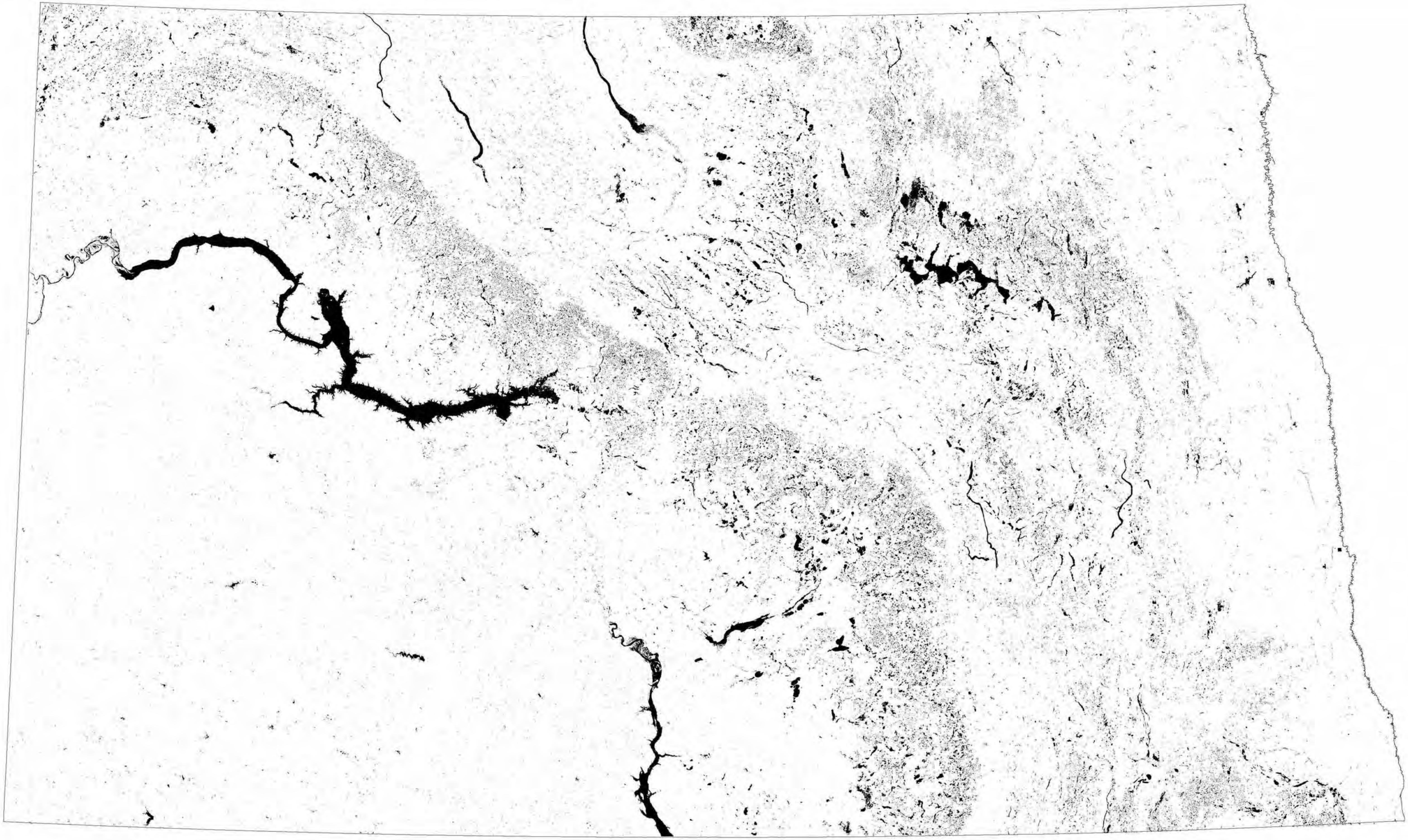
RING-NECKED DUCK(Aythya collaris)



REDHEAD(Aythya americana)

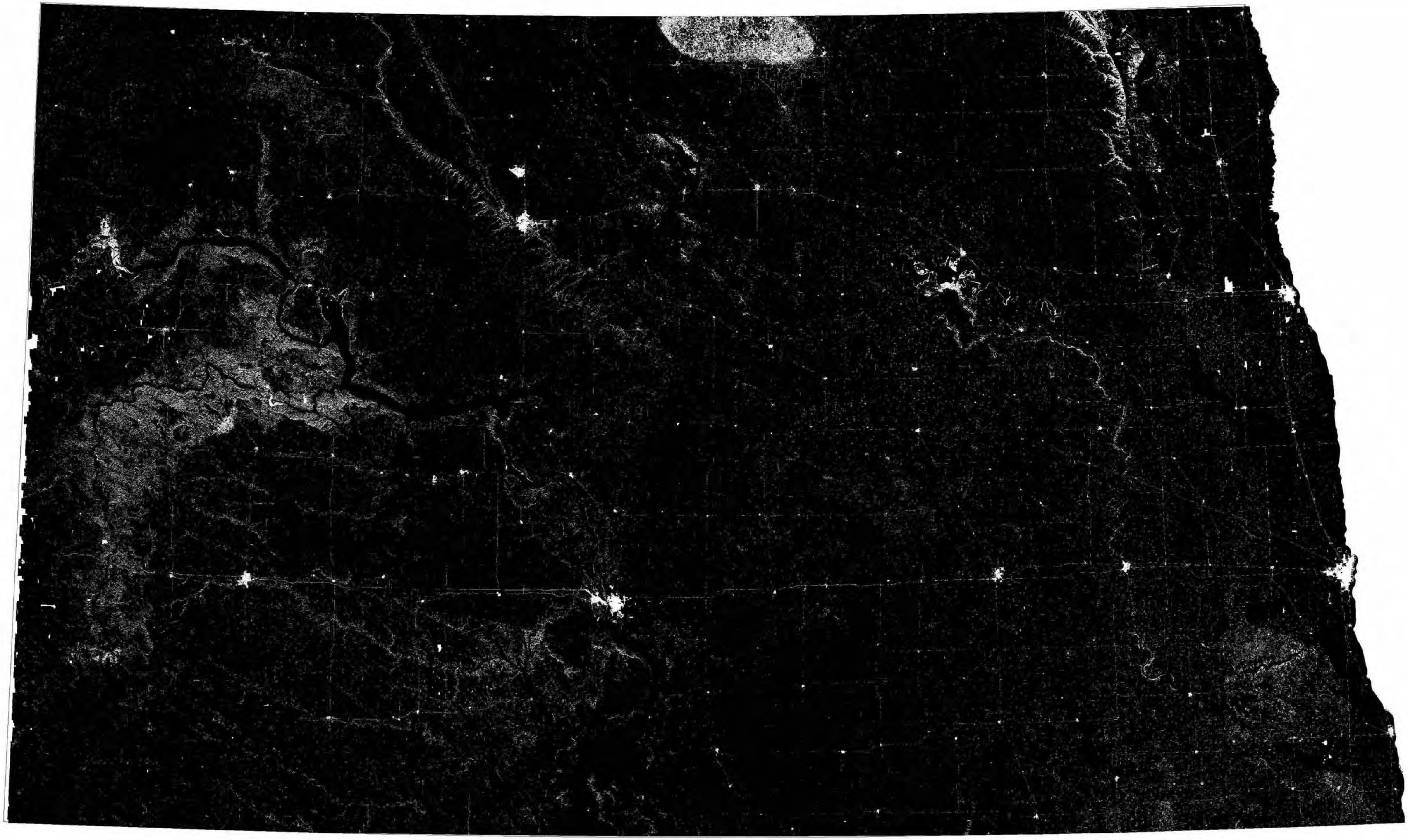


CANVASBACK(Aythya valisineria)

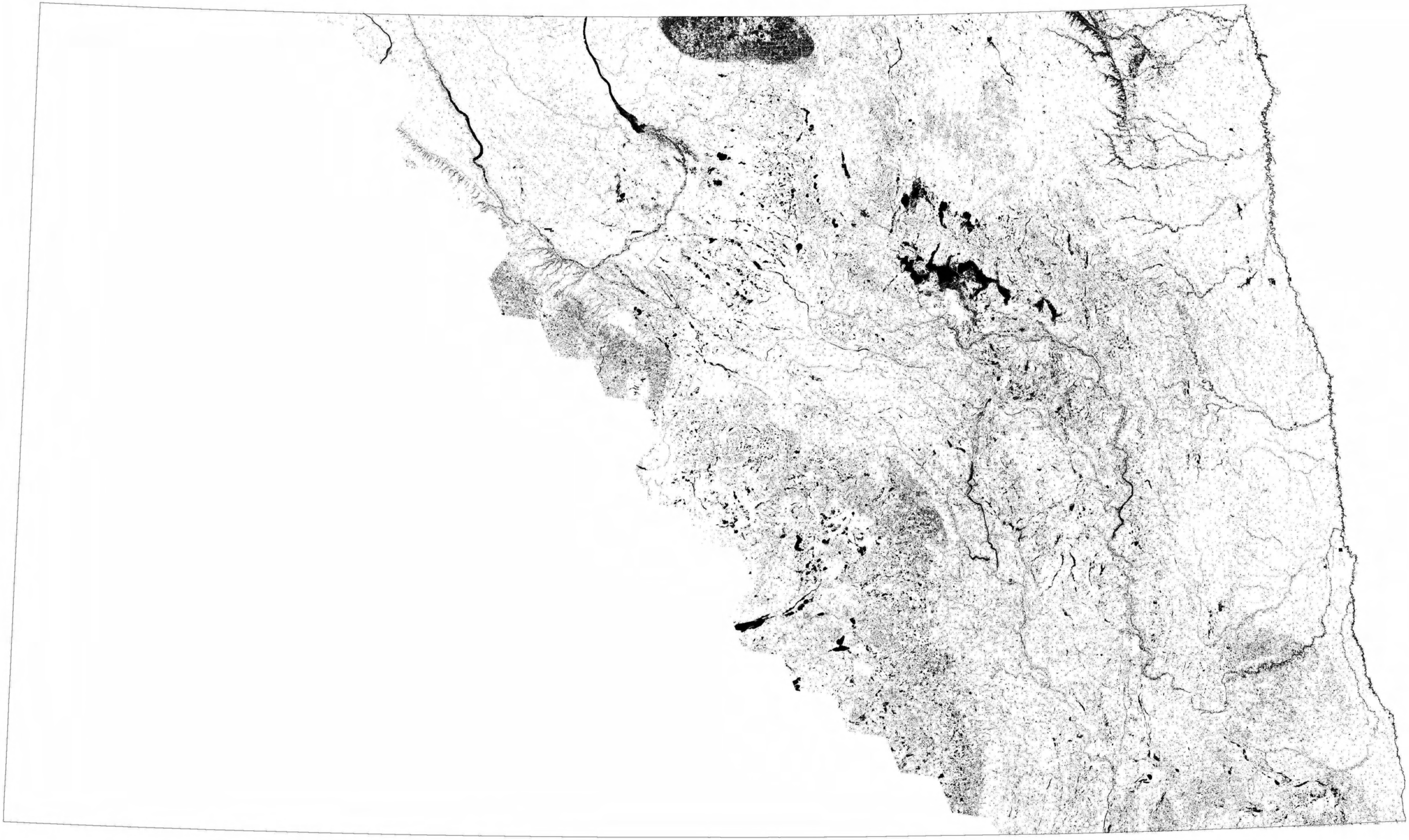


AMERICAN WIGEON(Anas americana)

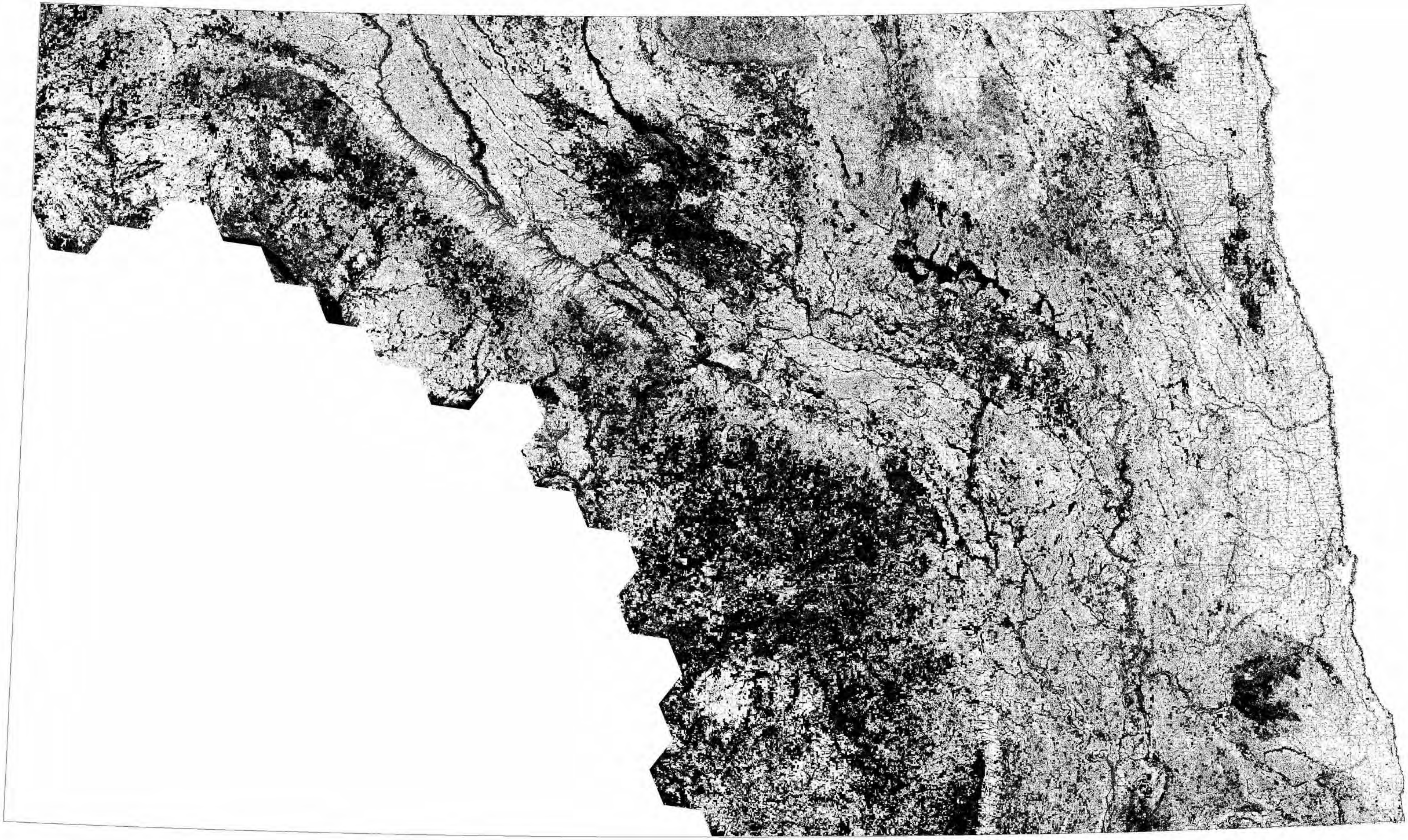
GADWALL(Anas strepera)



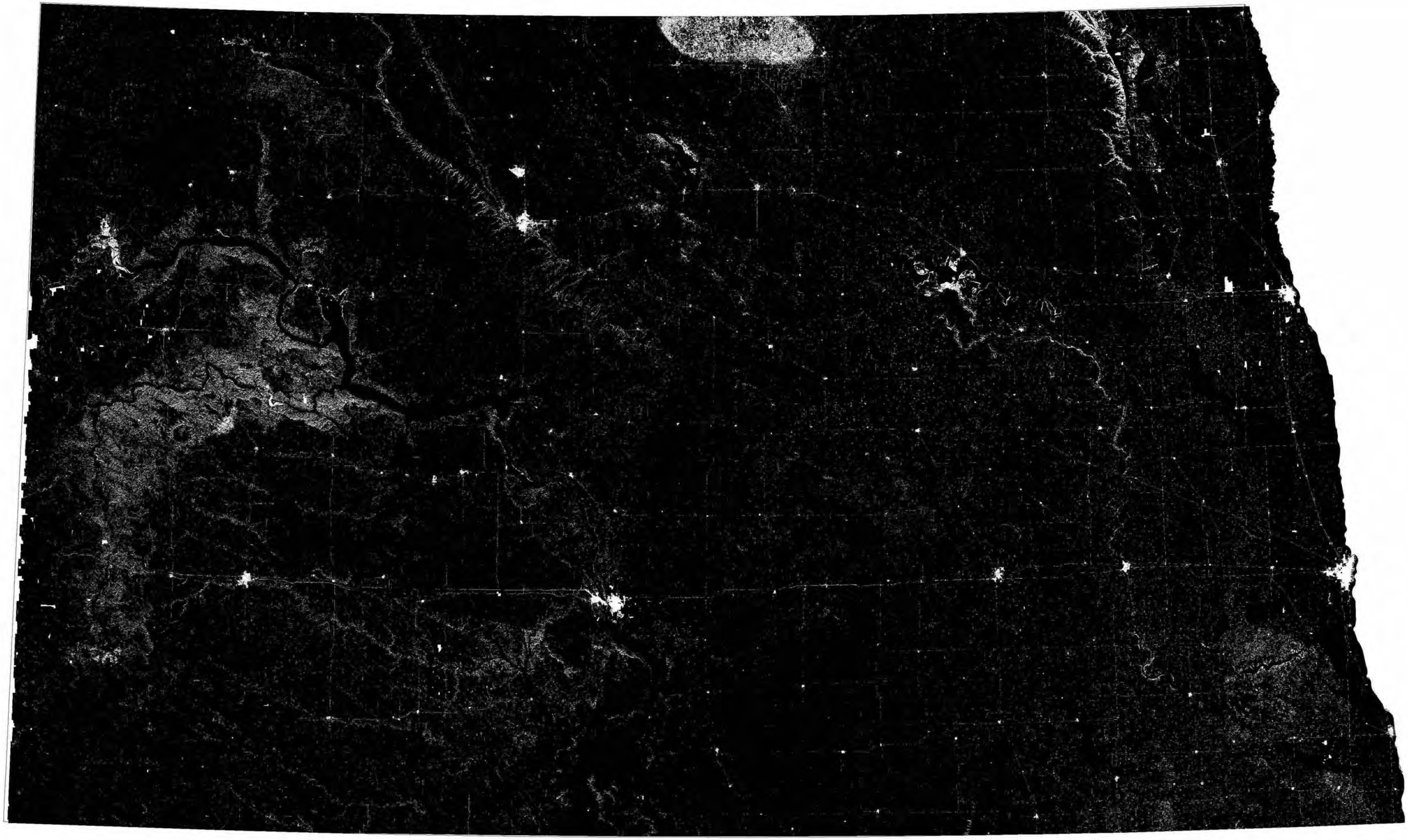
Northern Shoveler (Anas clypeata)



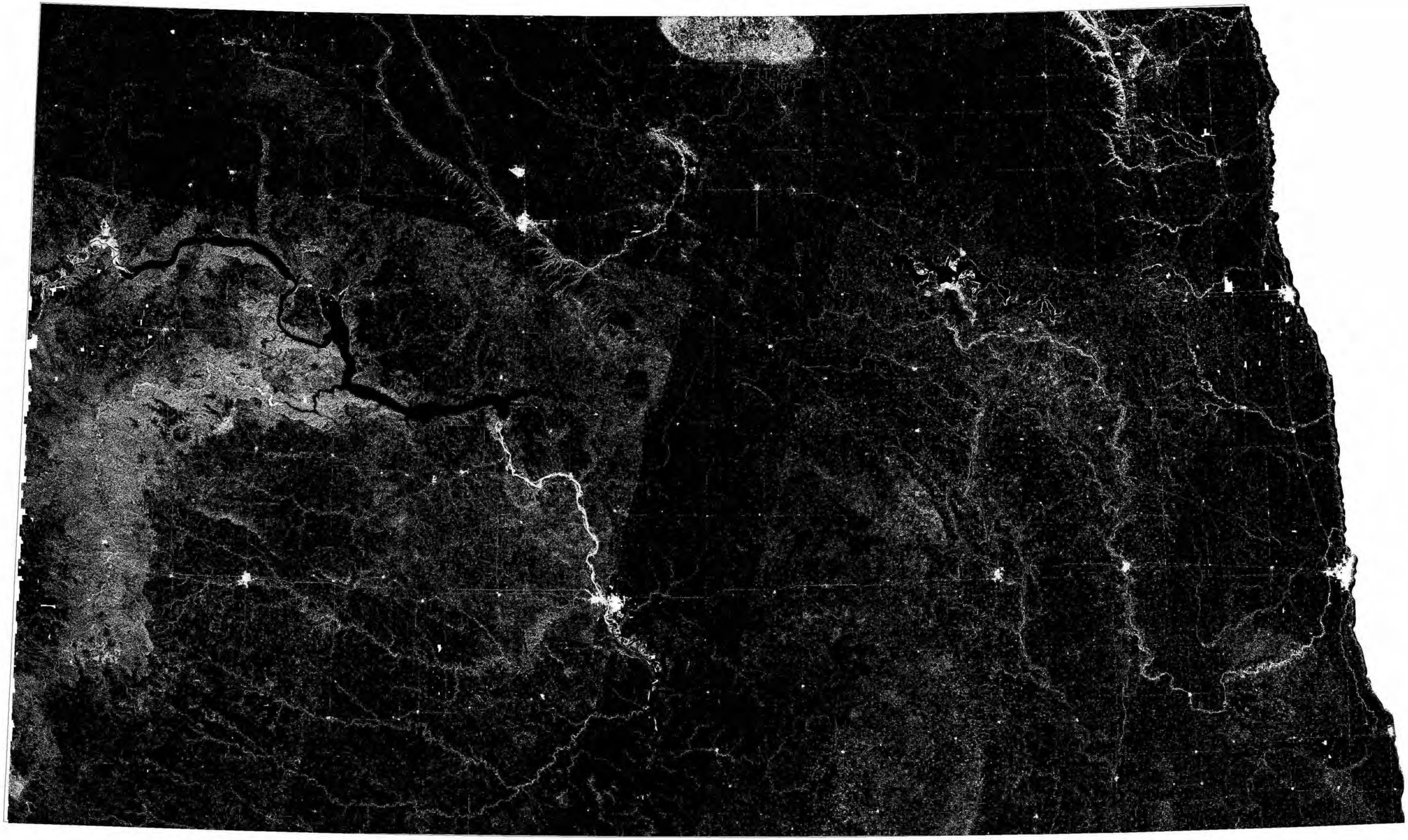
CINNAMON TEAL(Anas cyanoptera)



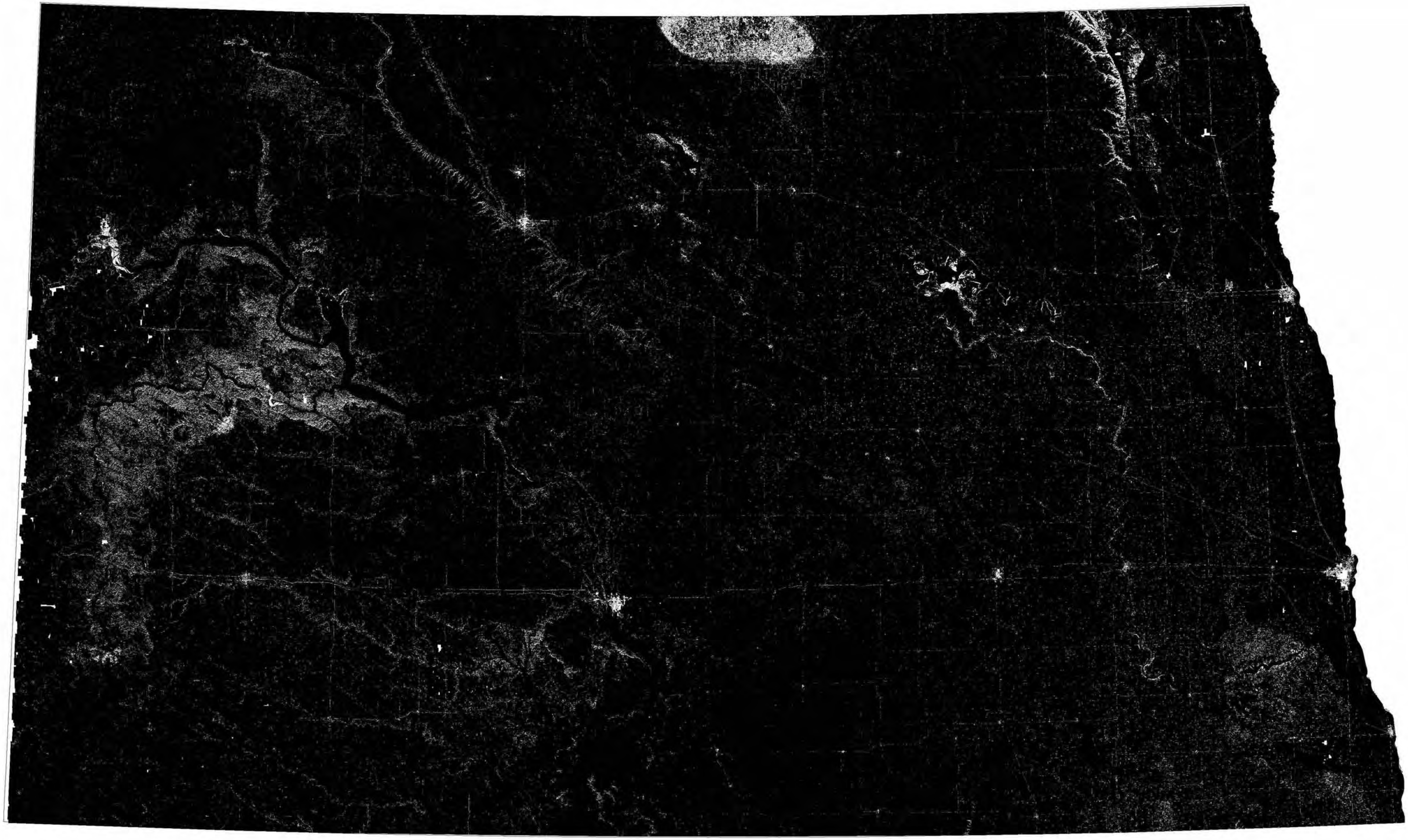
BLUE-WINGED TEAL(Anas discors)



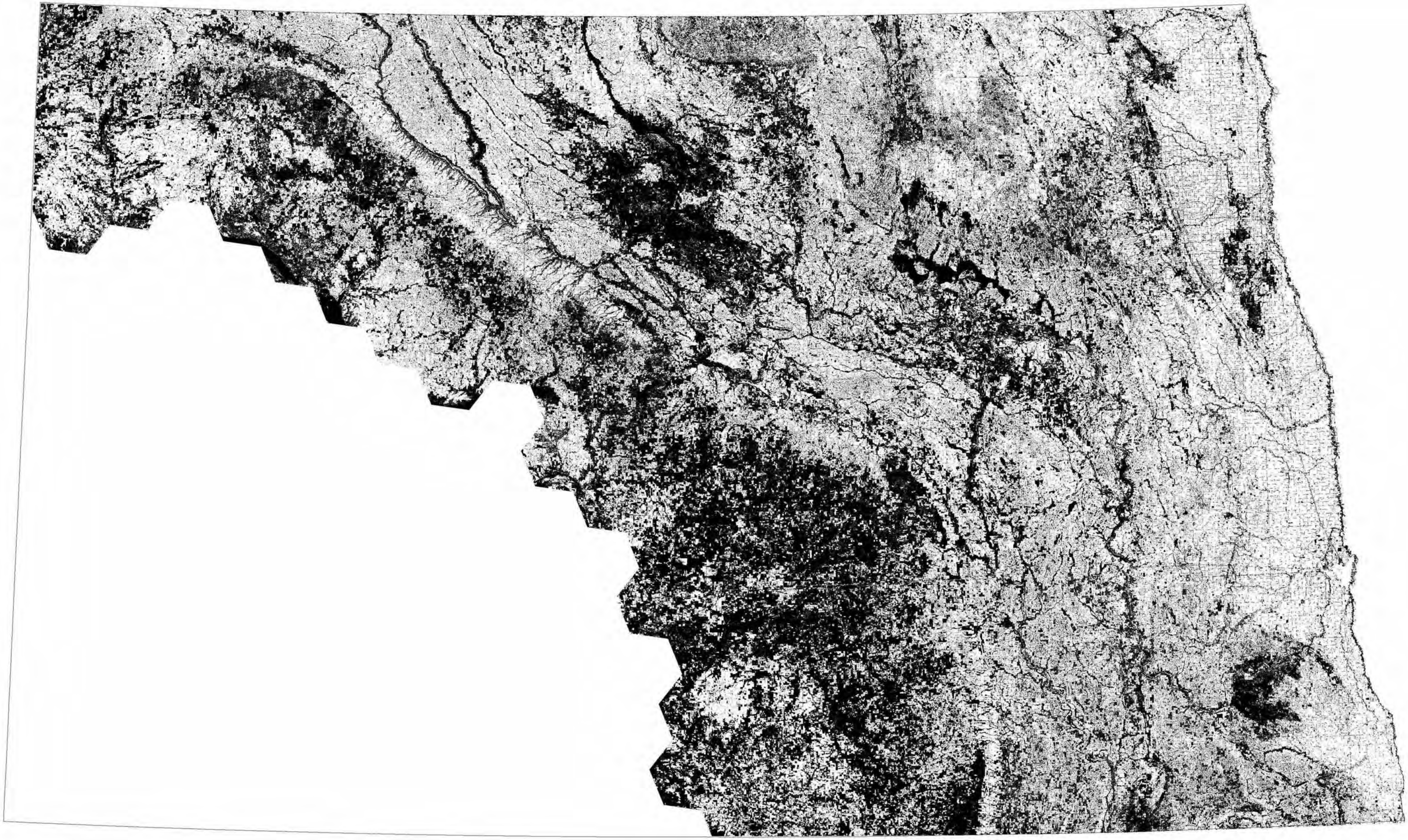
NORTHERN PINTAIL(Anas acuta)



MALLARD(Anas platyrhynchos)

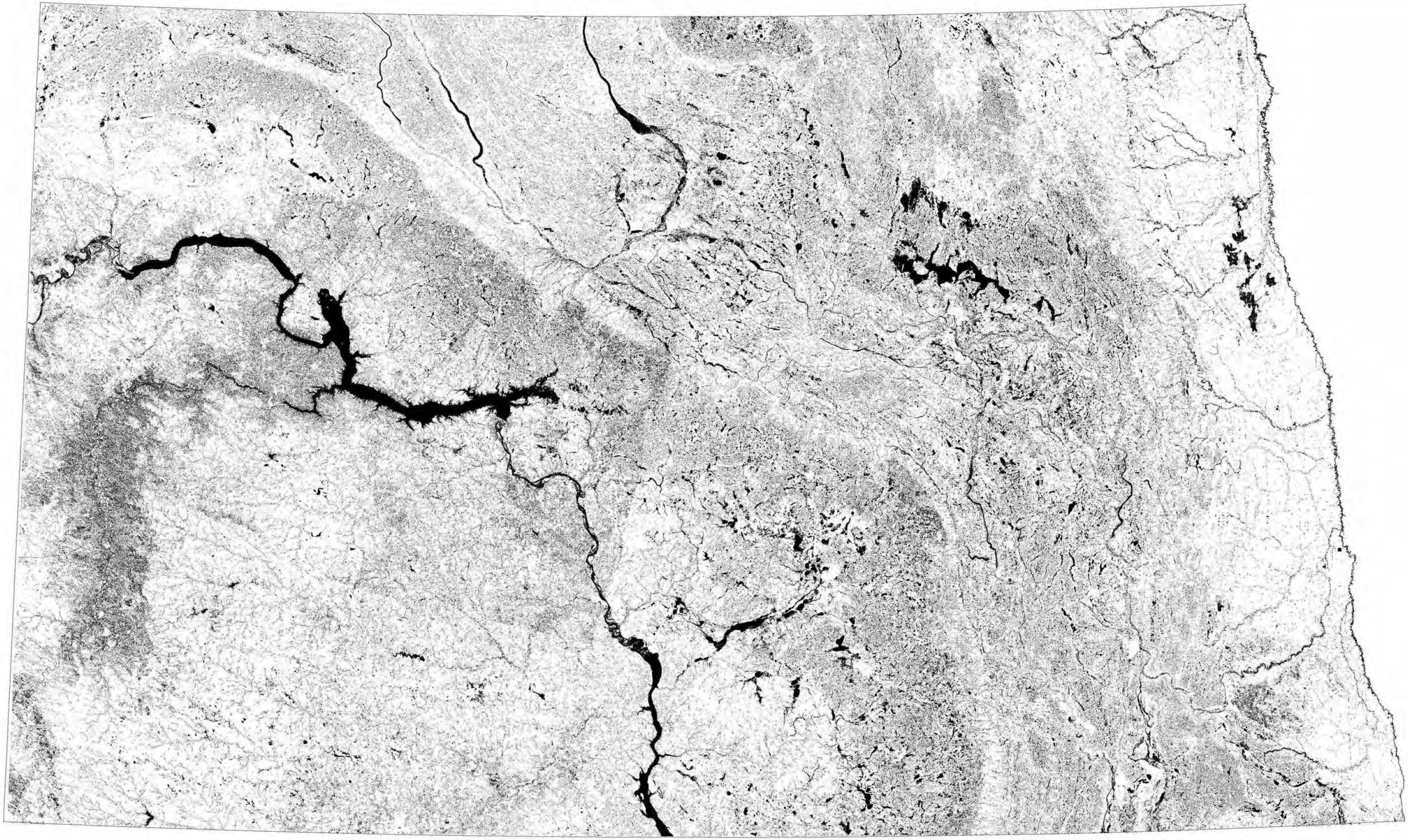


AMERICAN BLACK DUCK(Anas rubripes)



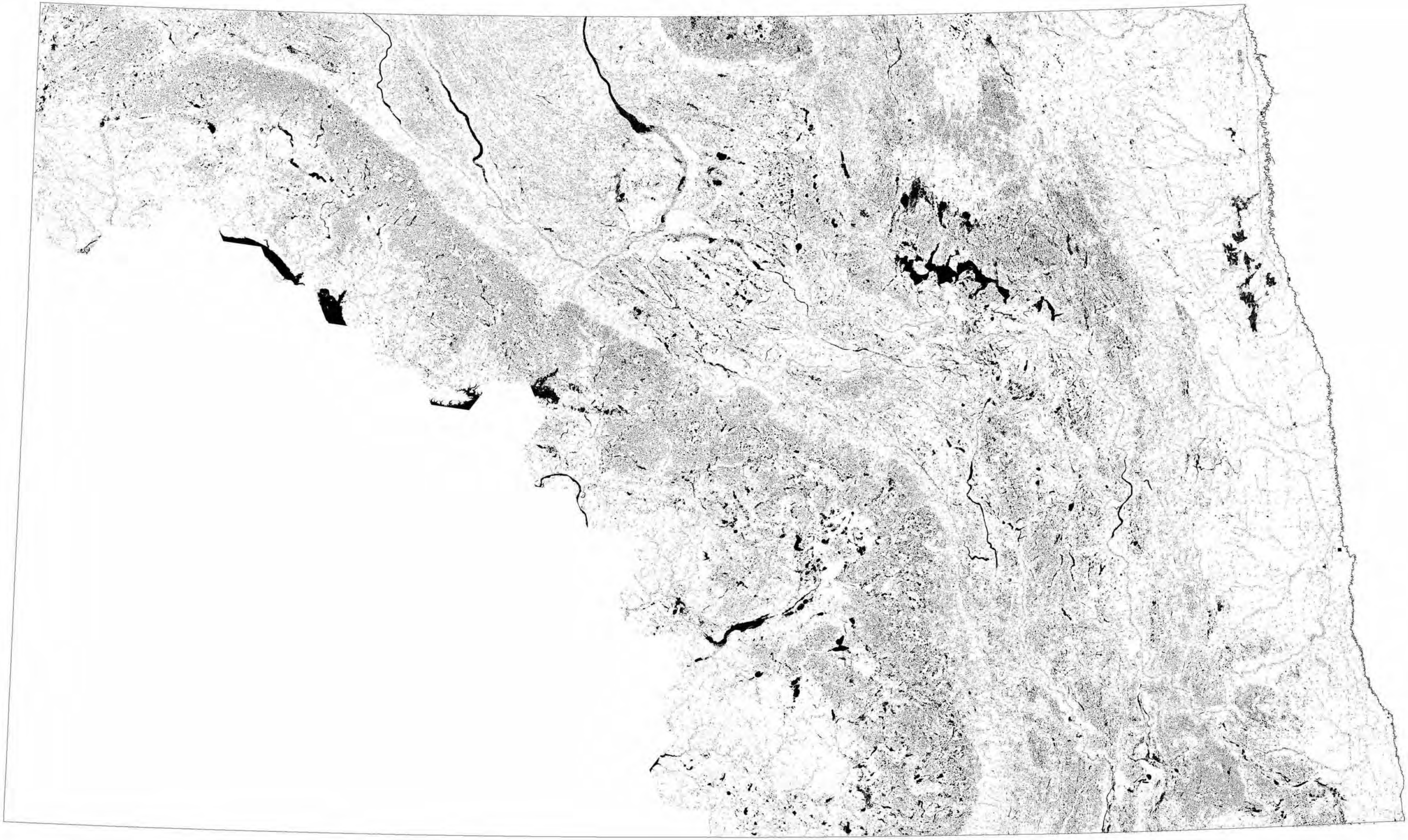
AMERICAN GREEN-WINGED TEAL(Anas crecca)

WOOD DUCK(Aix sponsa)

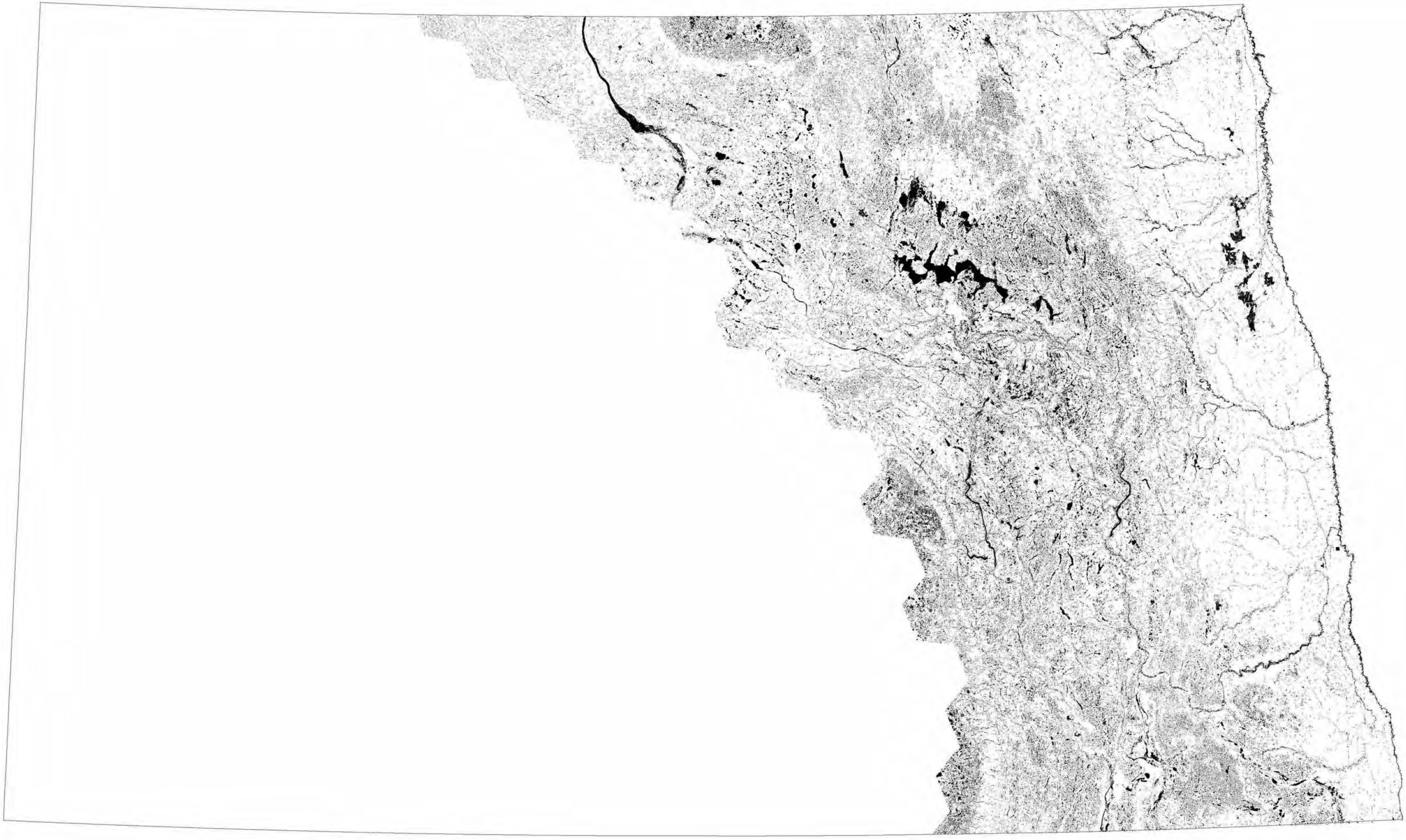


CANADA GOOSE(Branta canadensis)

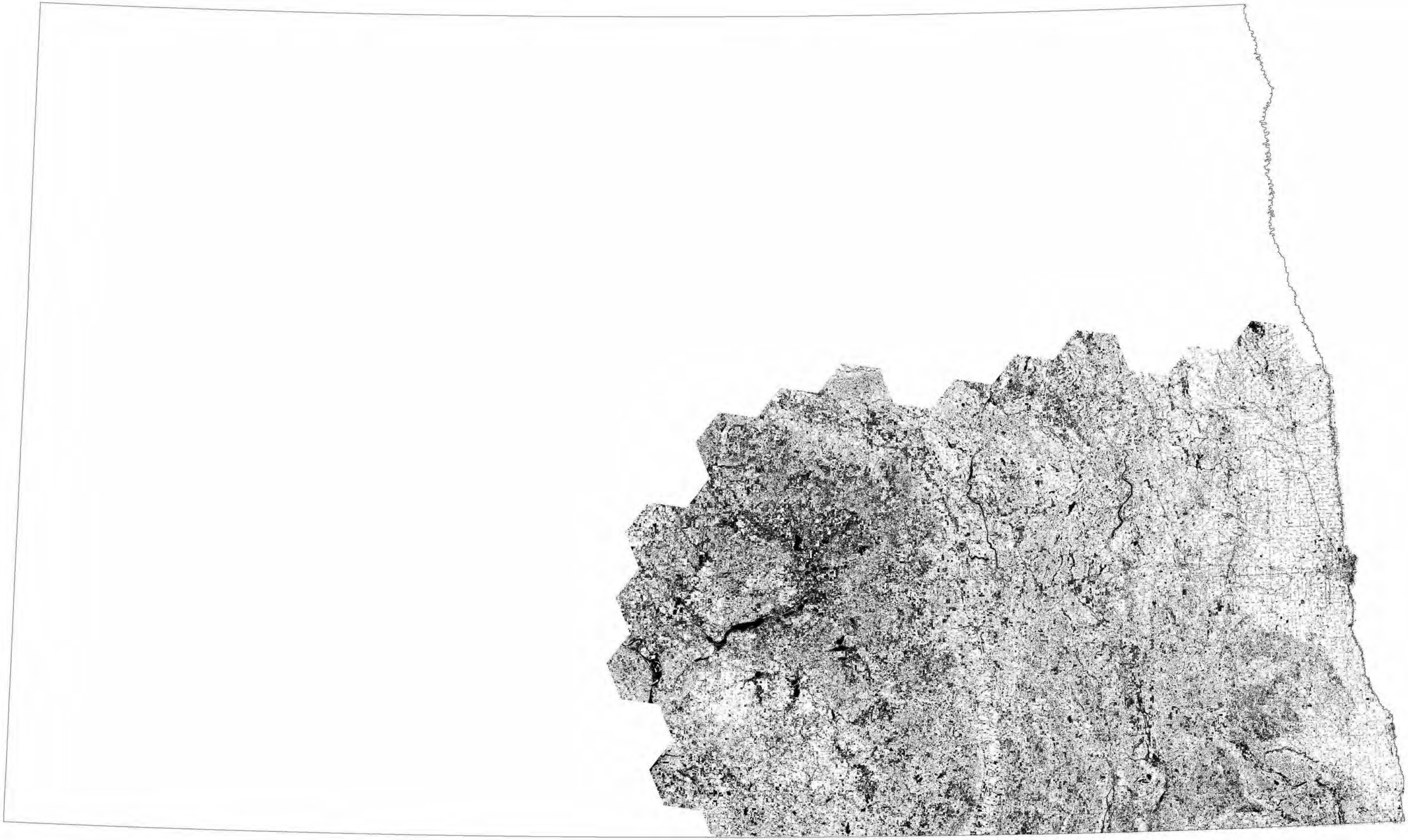
BLACK-CROWNED NIGHT-HERON(Nycticorax nycticorax)



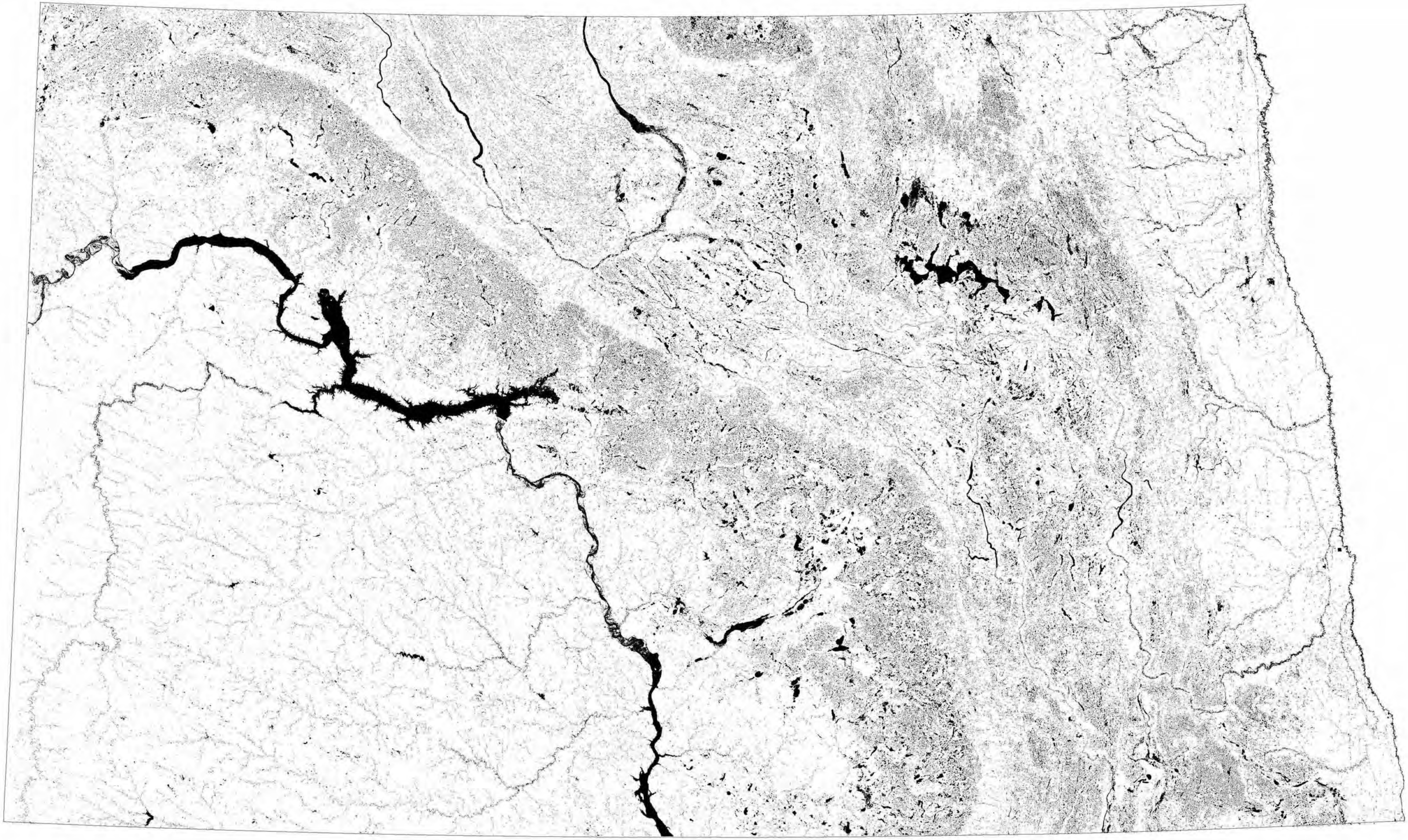
GREEN HERON(Butorides virescens)



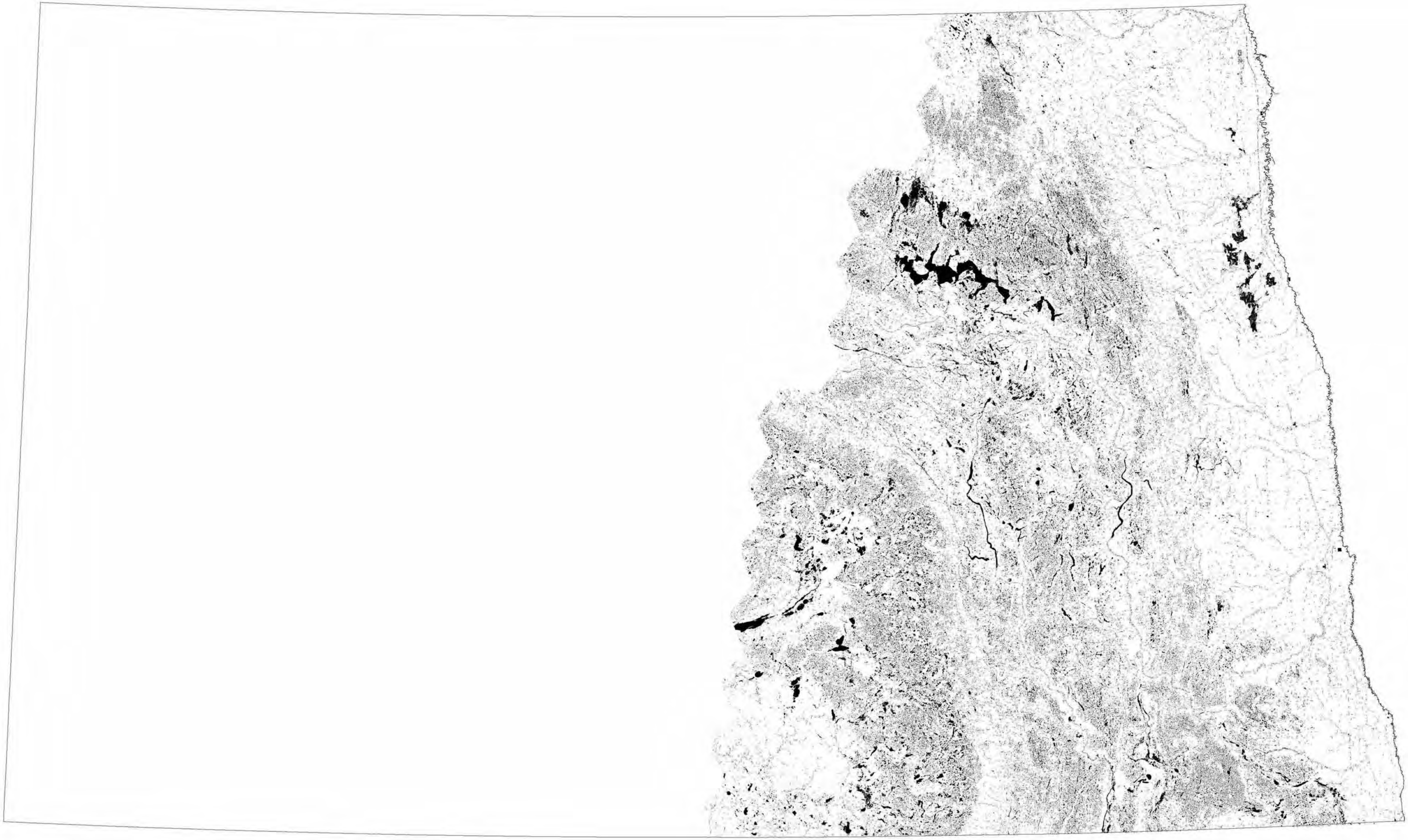
CATTLE EGRET(Bubulcus ibis)



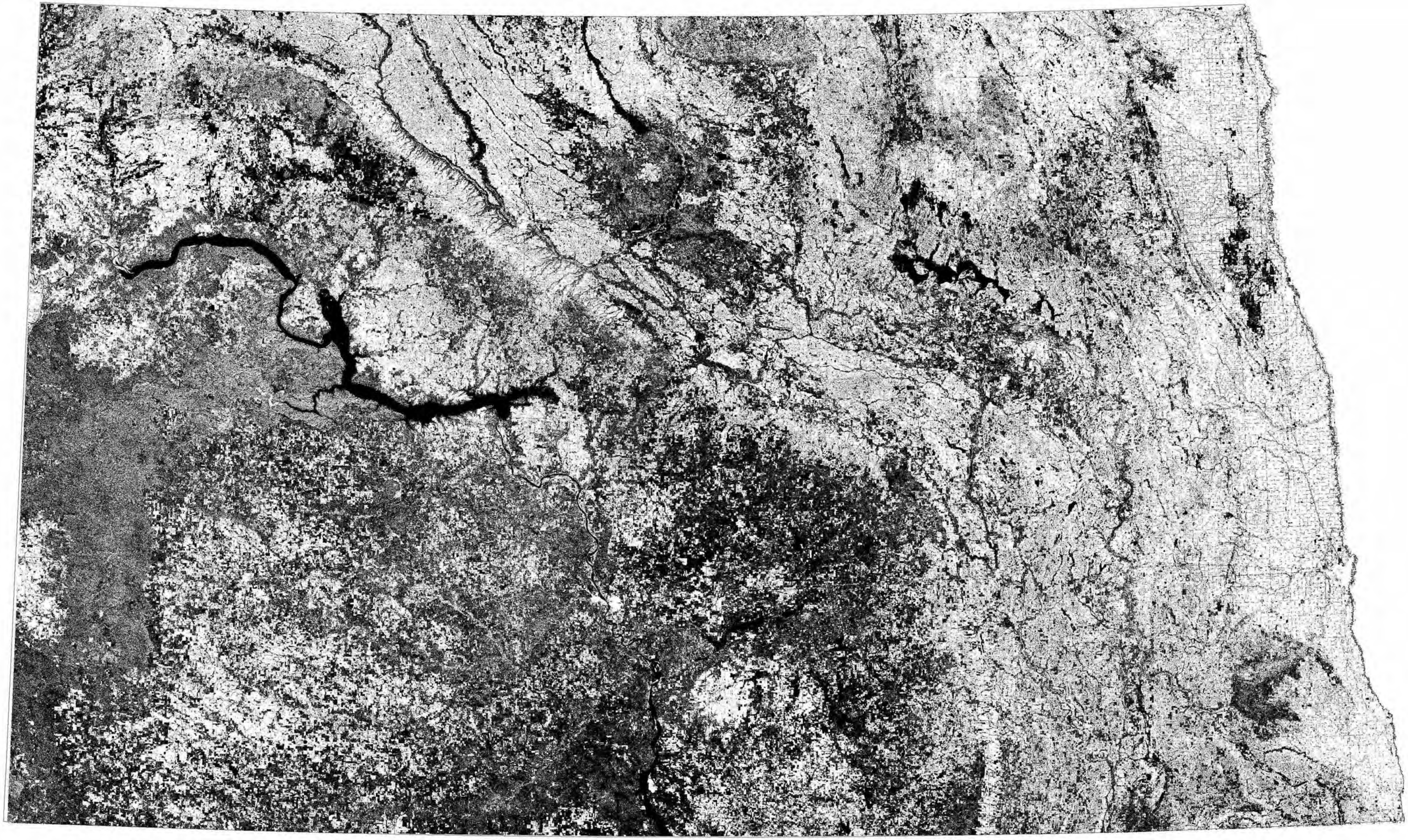
GREAT BLUE HERON(Ardea herodias)



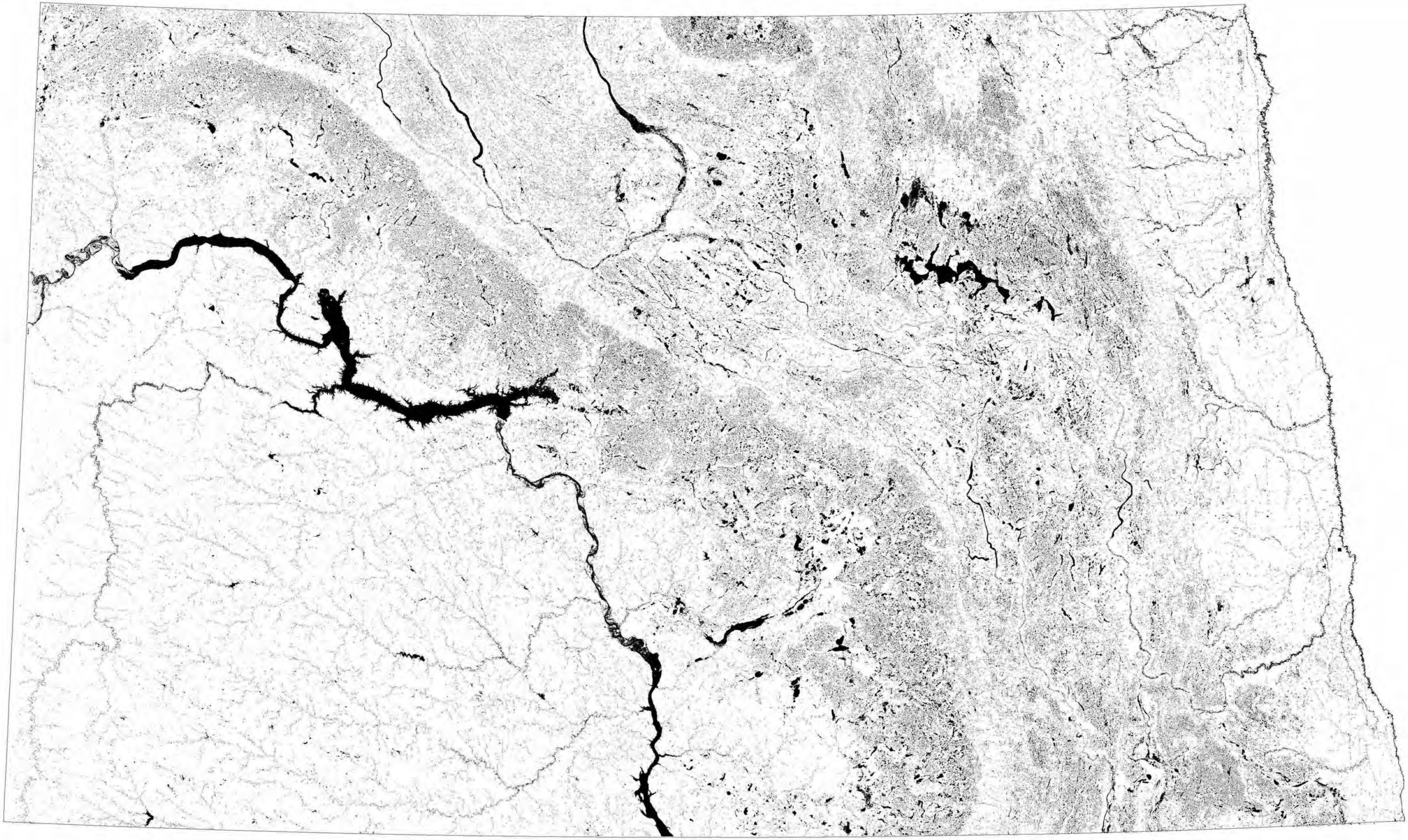
LEAST BITTERN(Ixobrychus exilis)



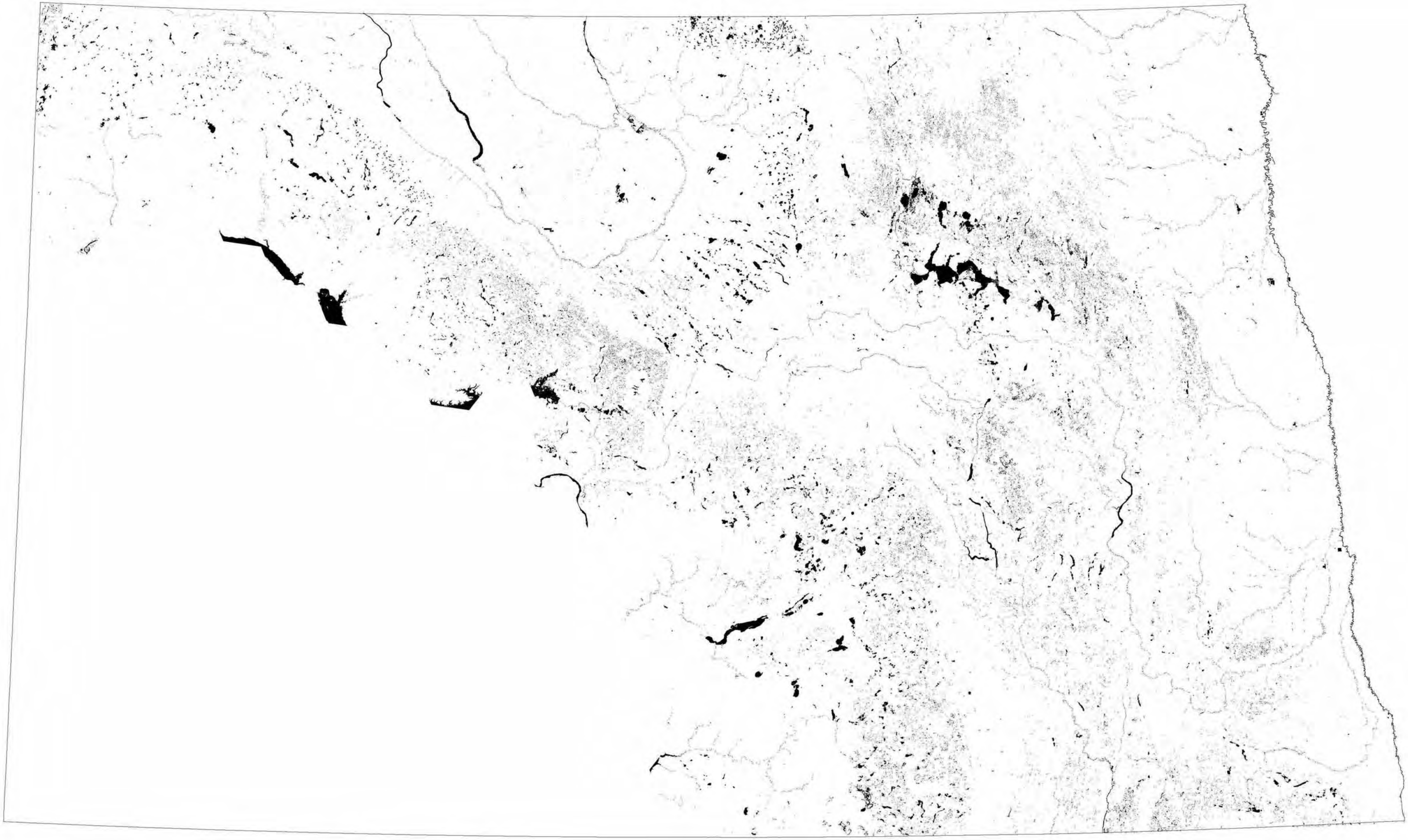
AMERICAN BITTERN(Botaurus lentiginosus)



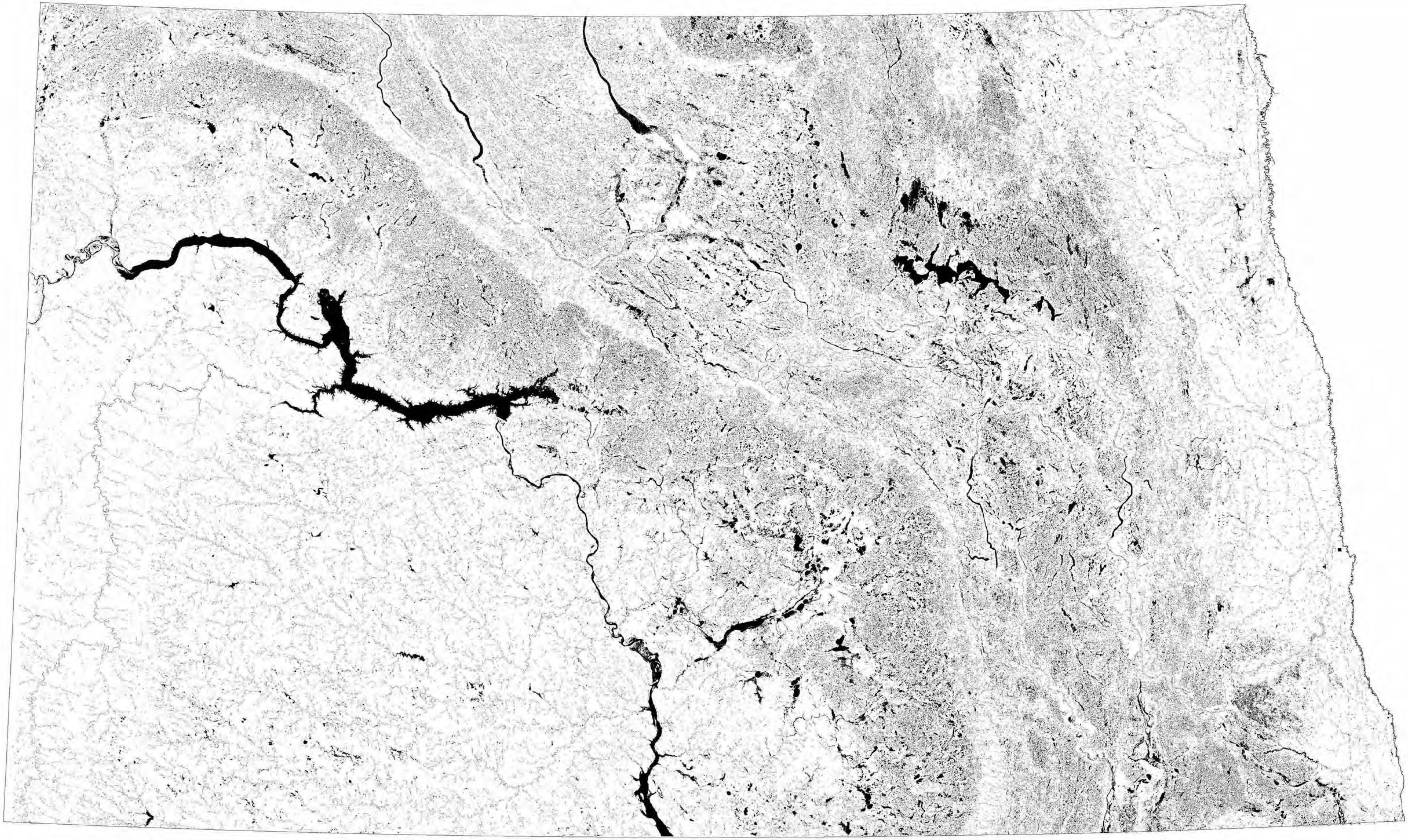
DOUBLE-CRESTED CORMORANT(Phalacrocorax auritus)



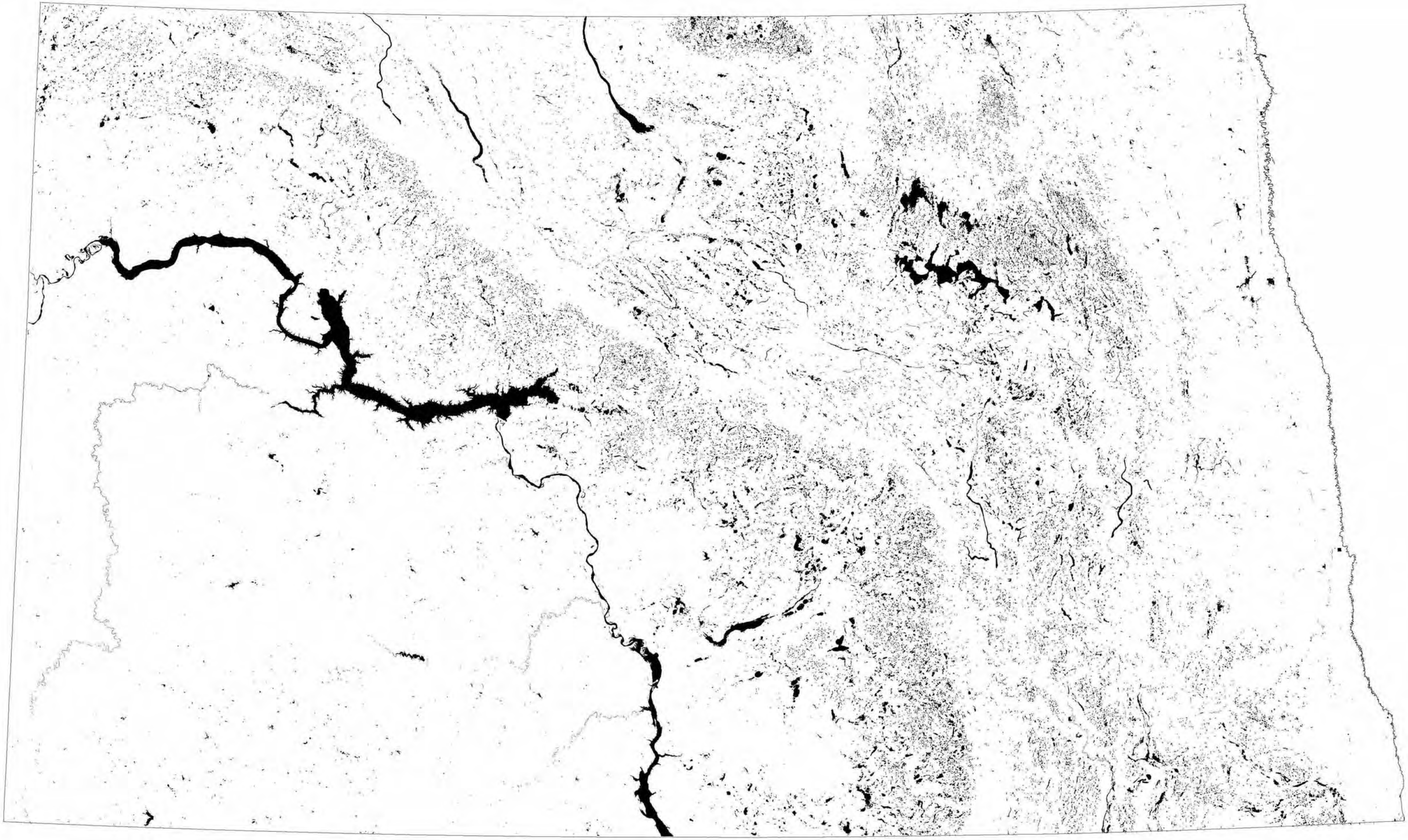
AMERICAN WHITE PELICAN(Pelecanus erythrorhynchos)



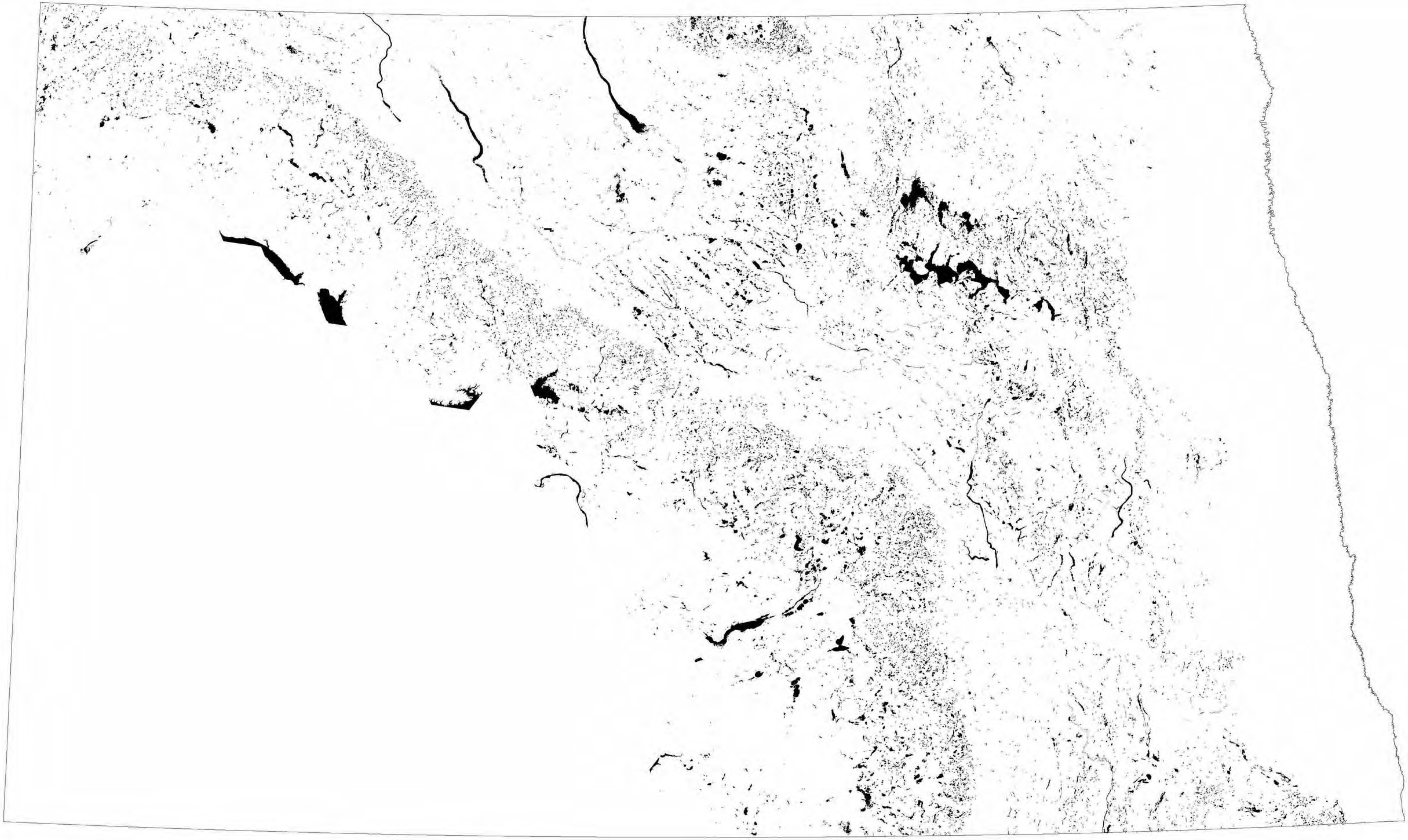
WESTERN GREBE(Aechmophorus occidentalis)



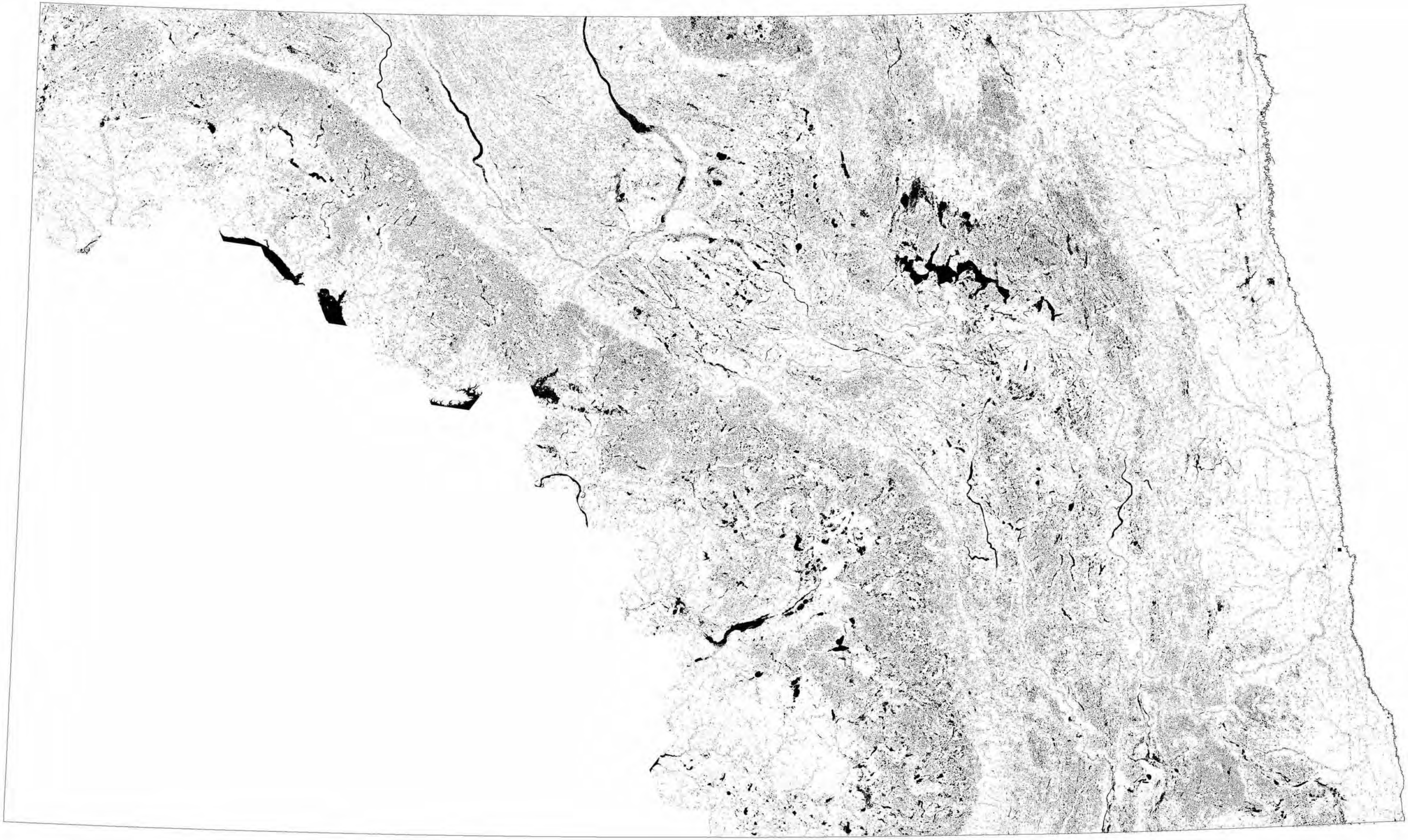
EARED GREBE(Podiceps nigricollis)



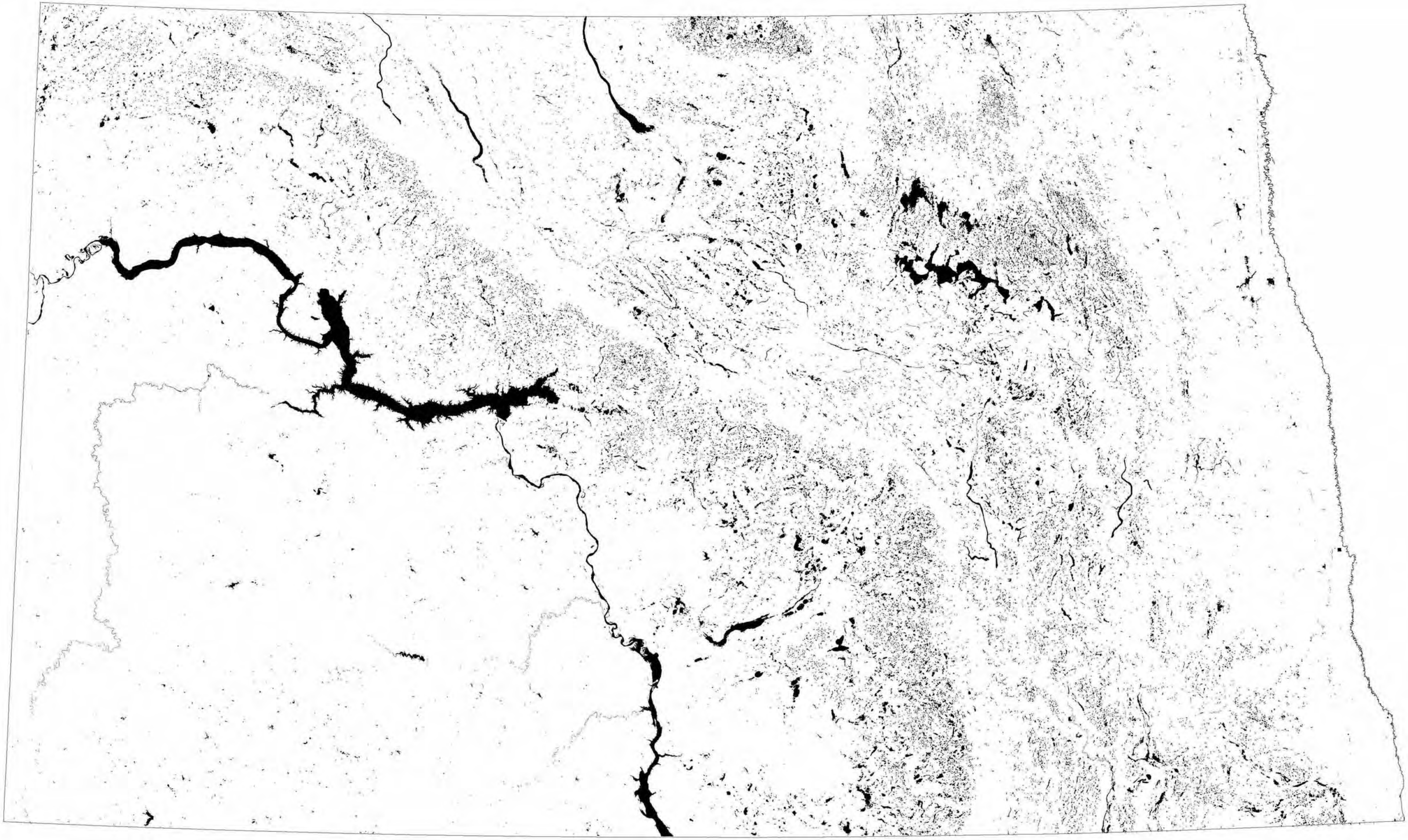
RED-NECKED GREBE(Podiceps grisegena)



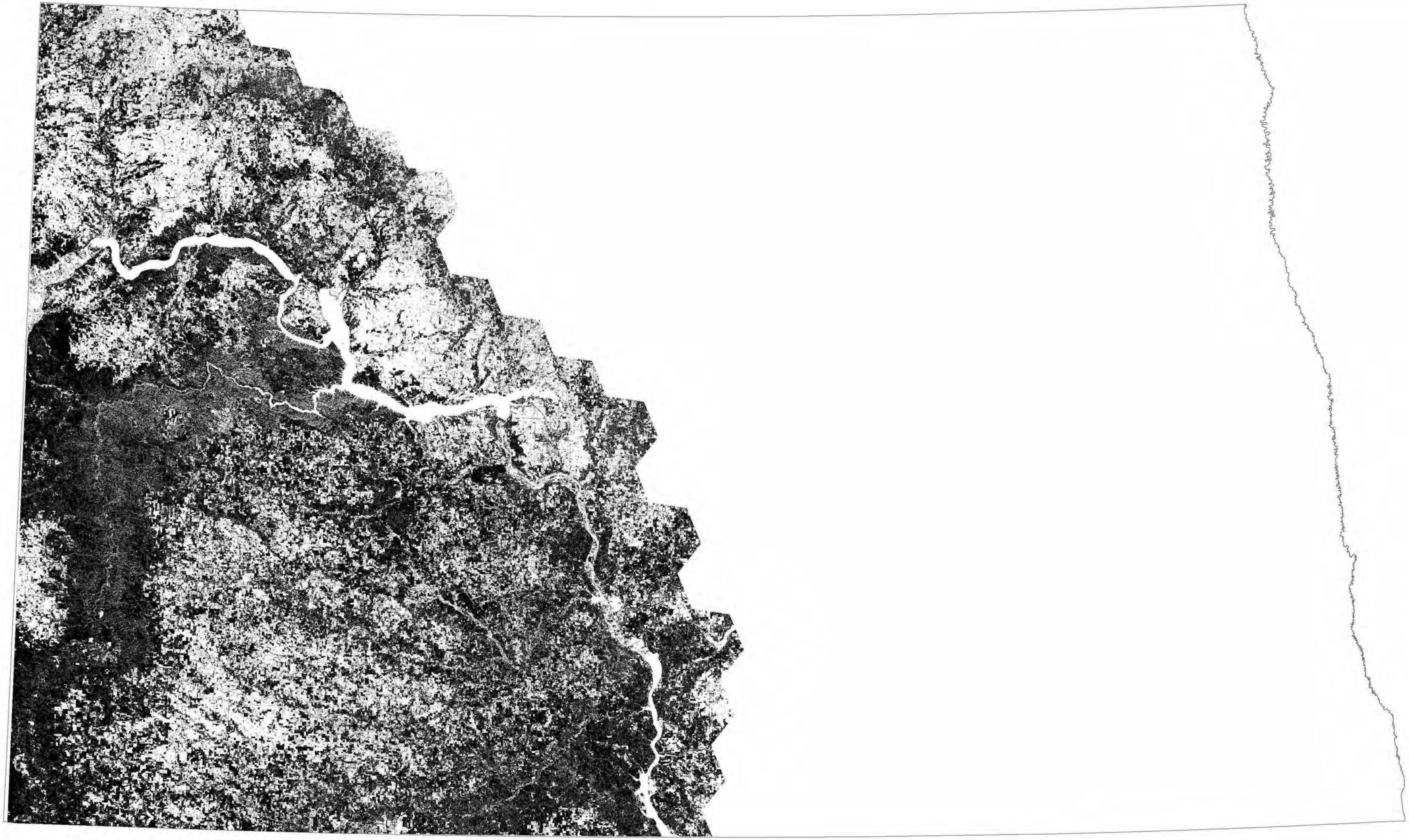
HORNED GREBE(Podiceps auritus))



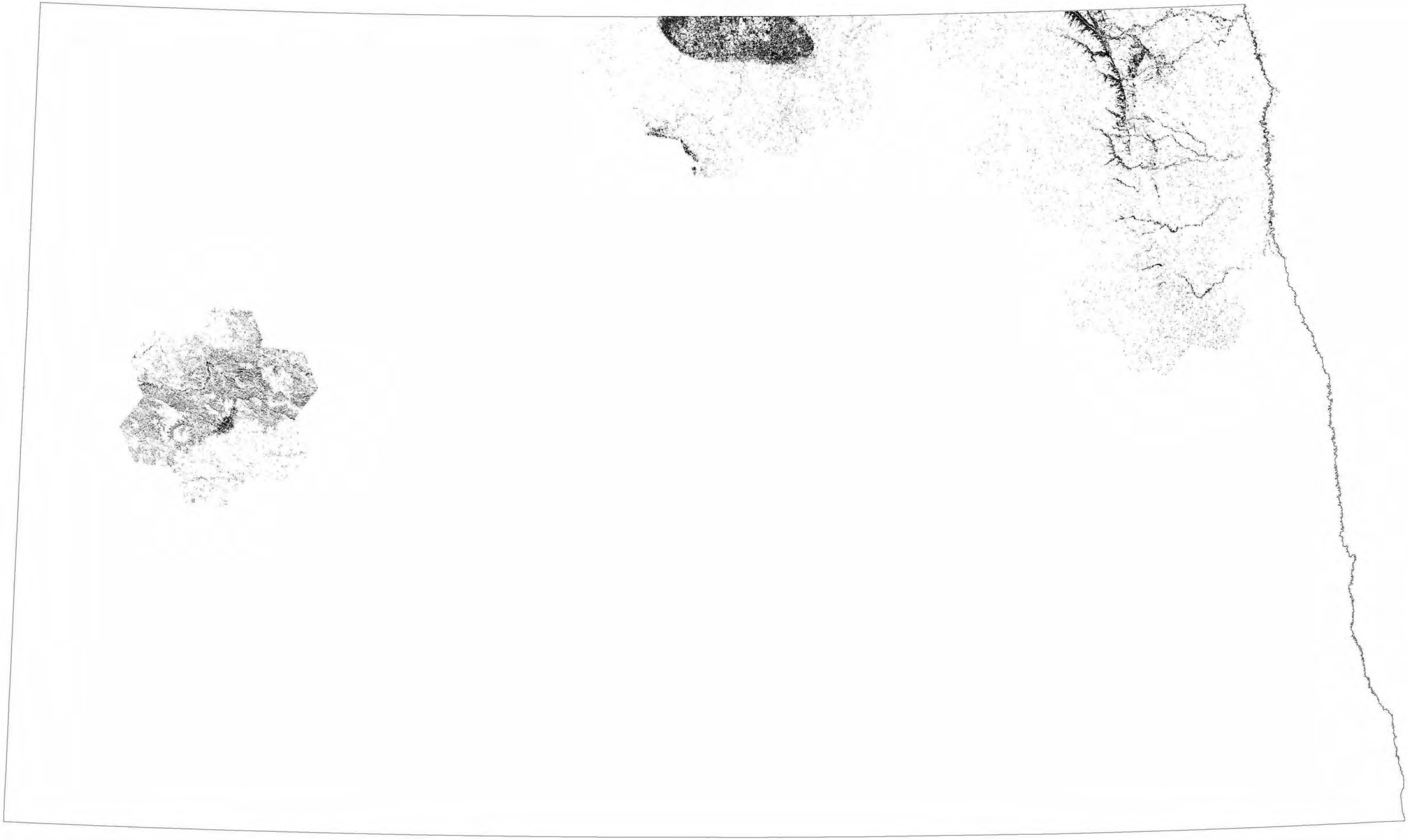
PIED-BILLED GREBE(Podilymbus podiceps)



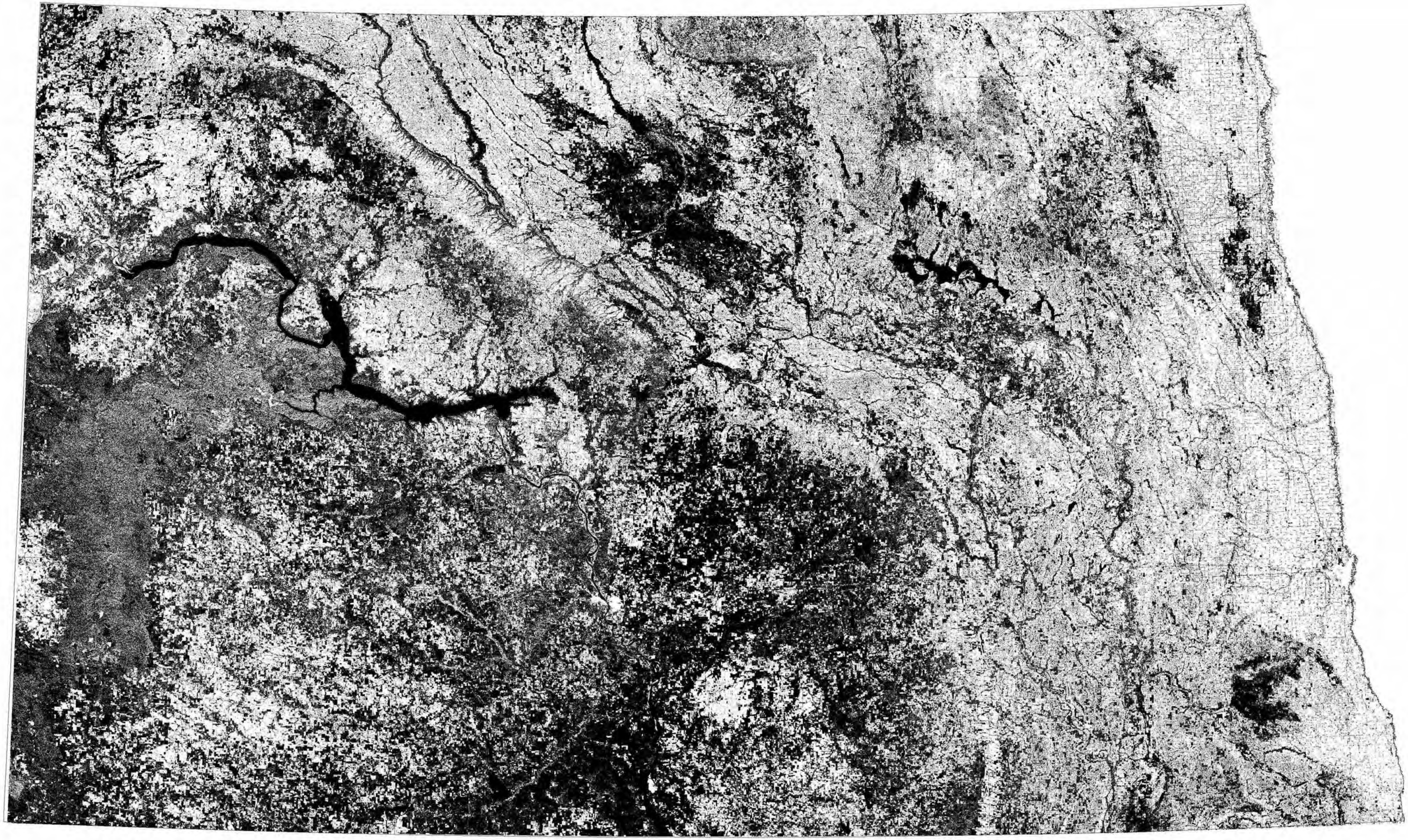
PRAIRIE FALCON(Falco mexicanus)



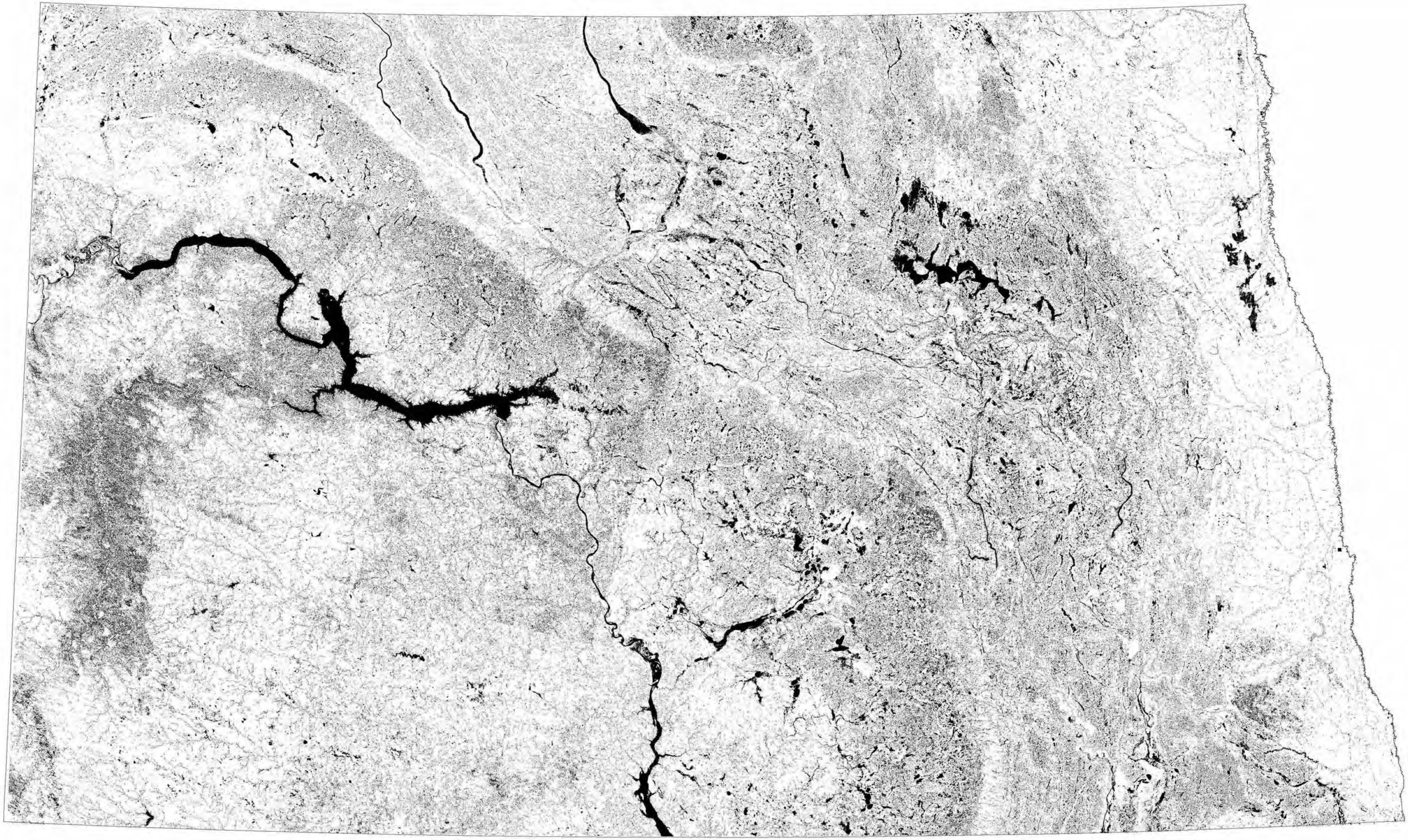
RUFFED GROUSE(Bonasa umbellus)



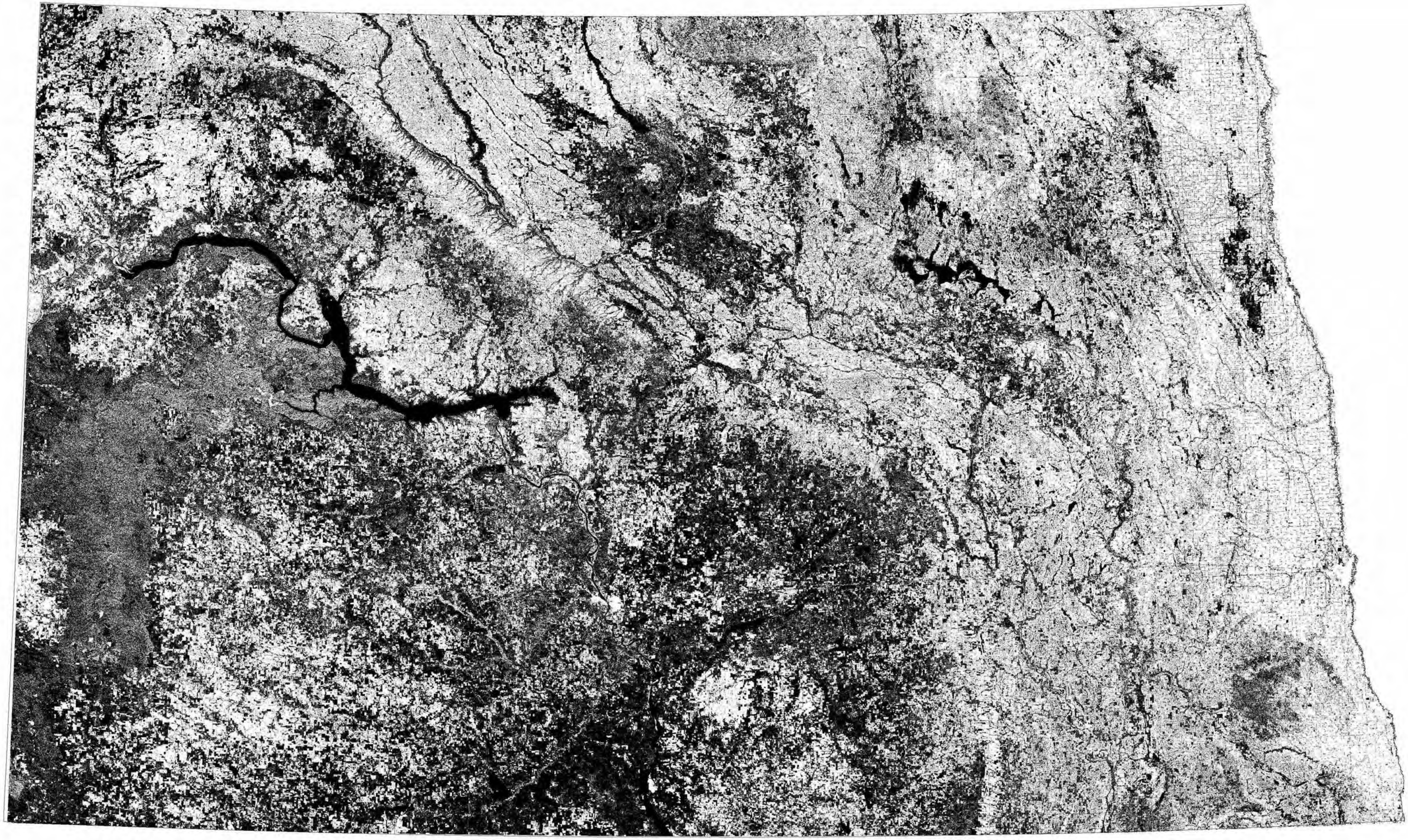
WILSON'S PHALAROPE(Phalaropus tricolor)



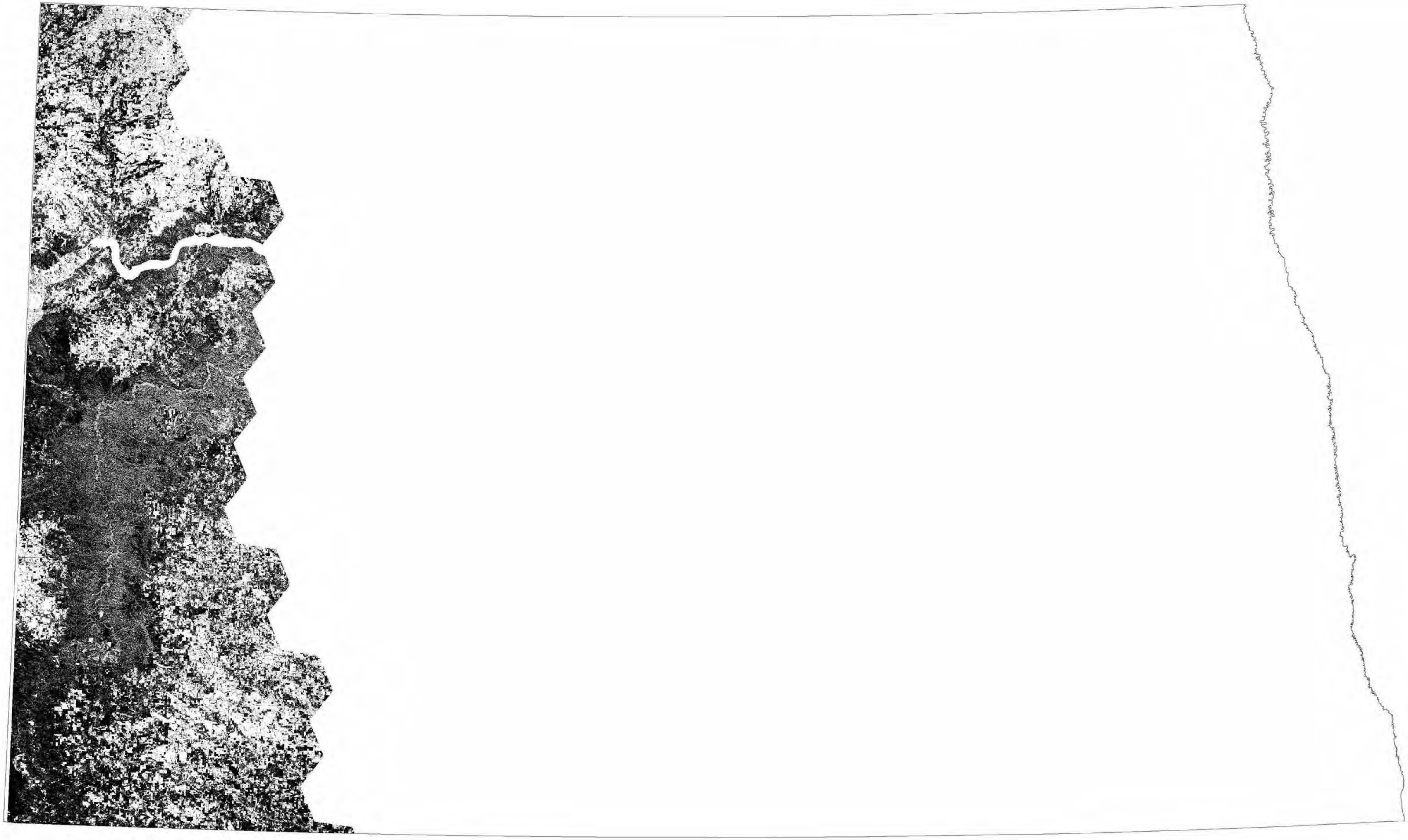
COMMON SNIPE(Gallinago gallinago)



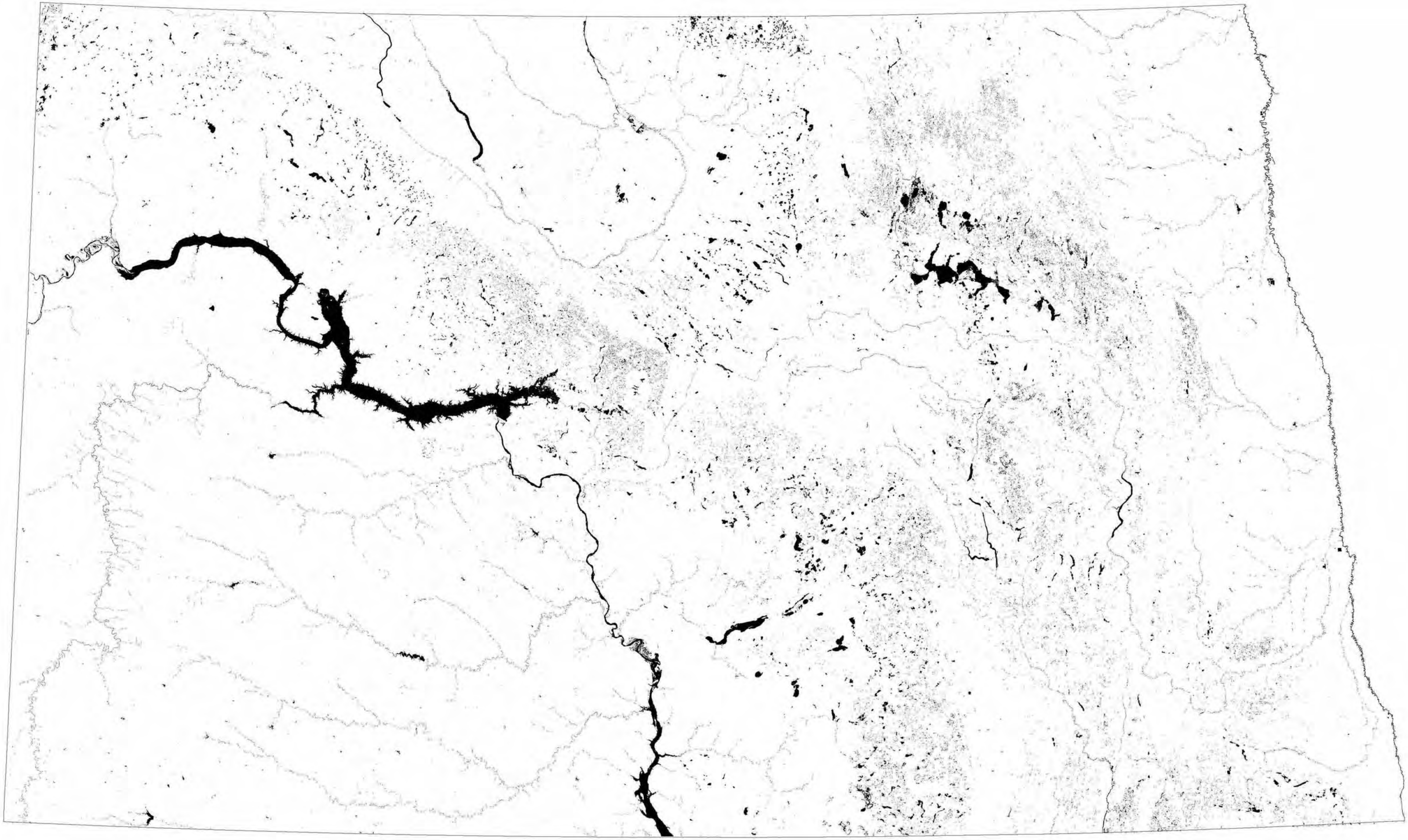
MARBLED GODWIT(Limosa fedoa)



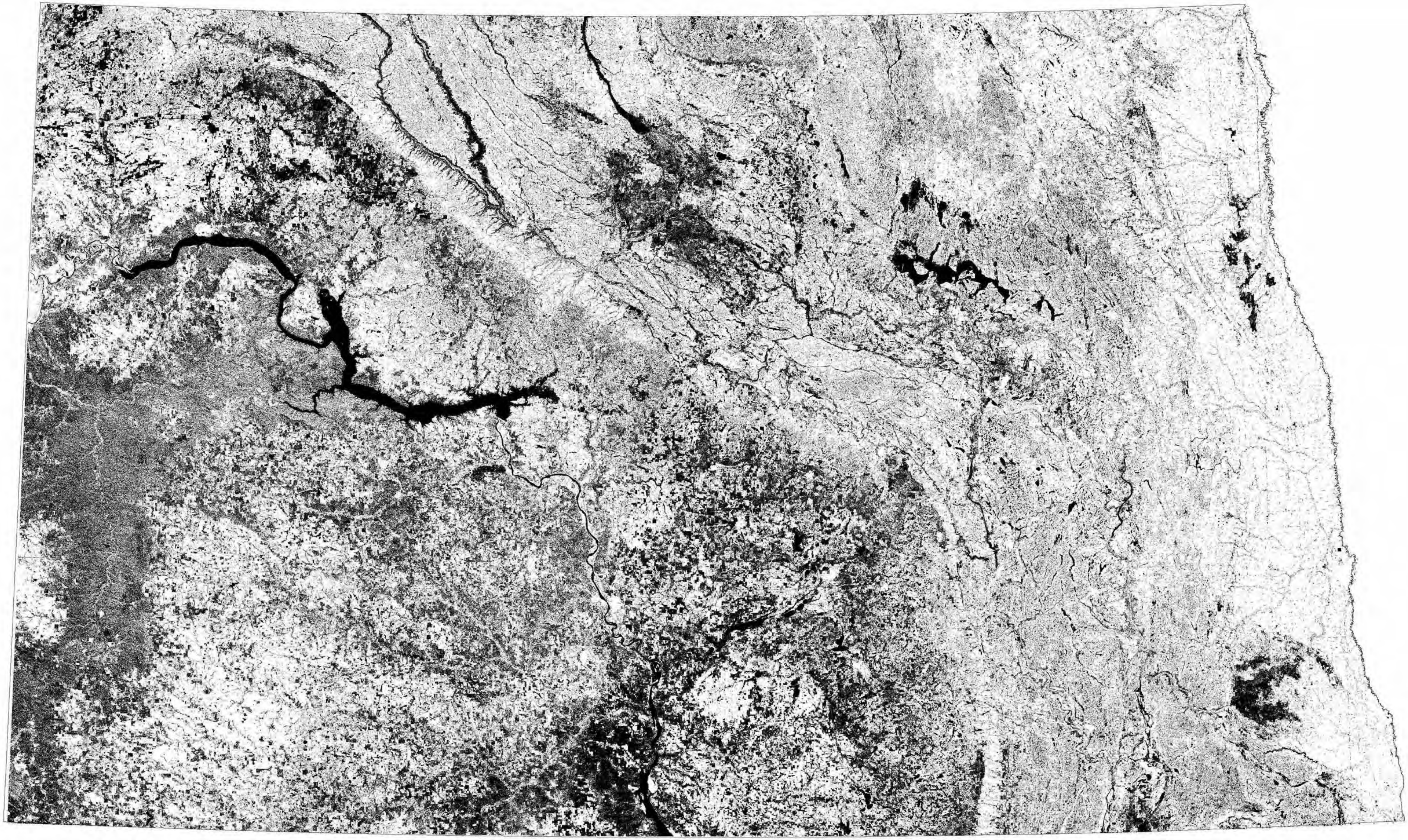
LONG-BILLED CURLEW(Numenius americanus)



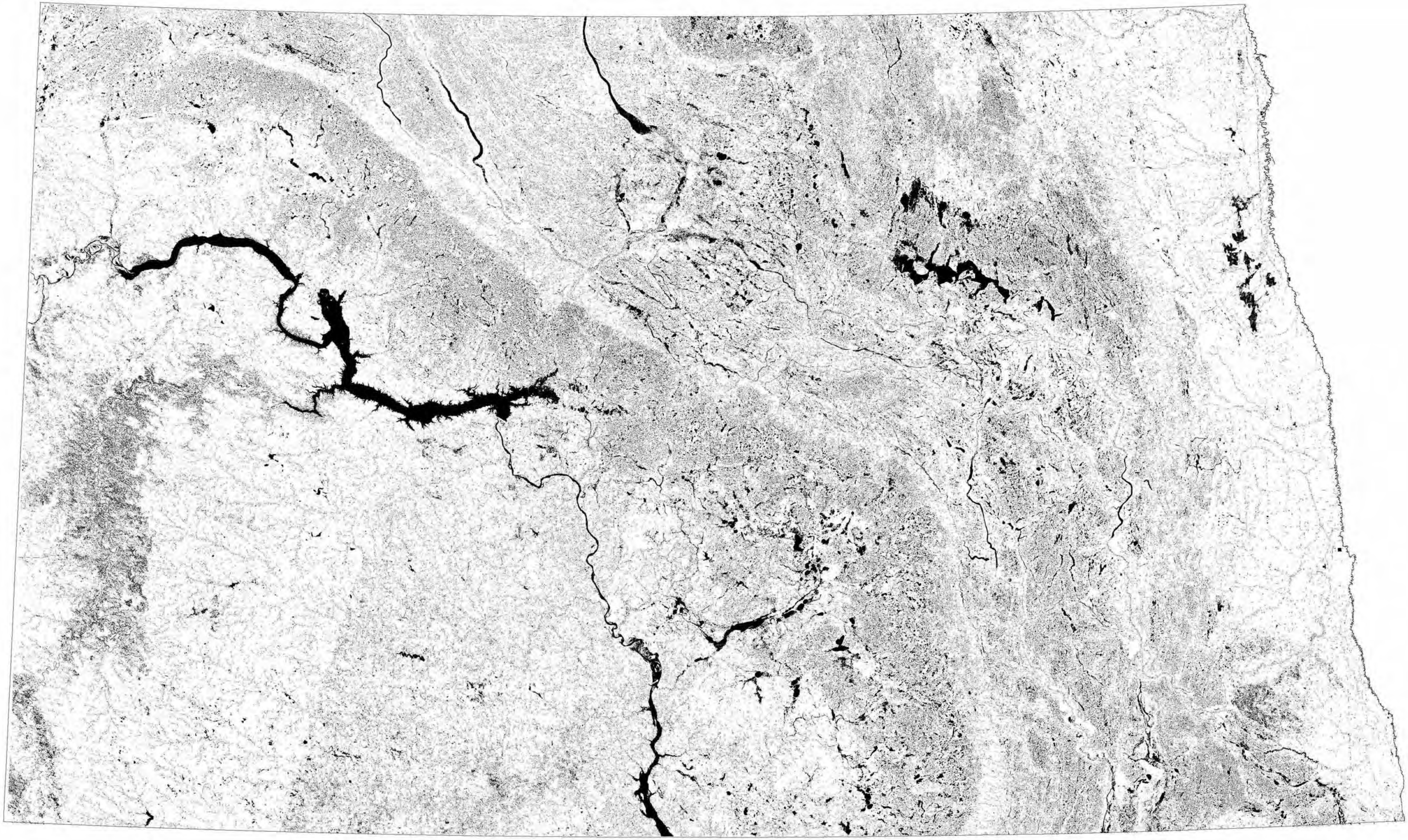
SPOTTED SANDPIPER(Actitis macularia)



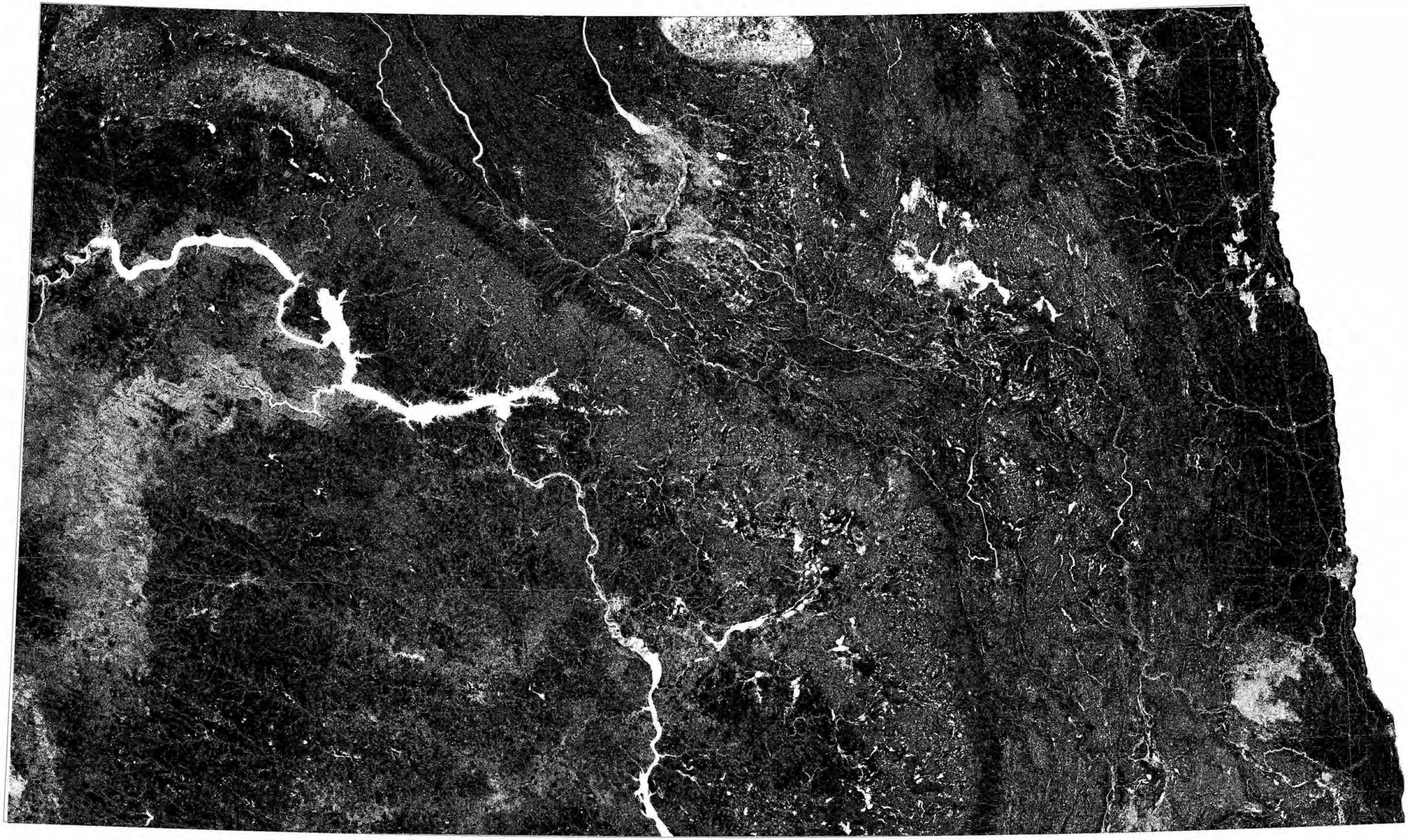
WILLET(Catoptrophorus semipalmatus)



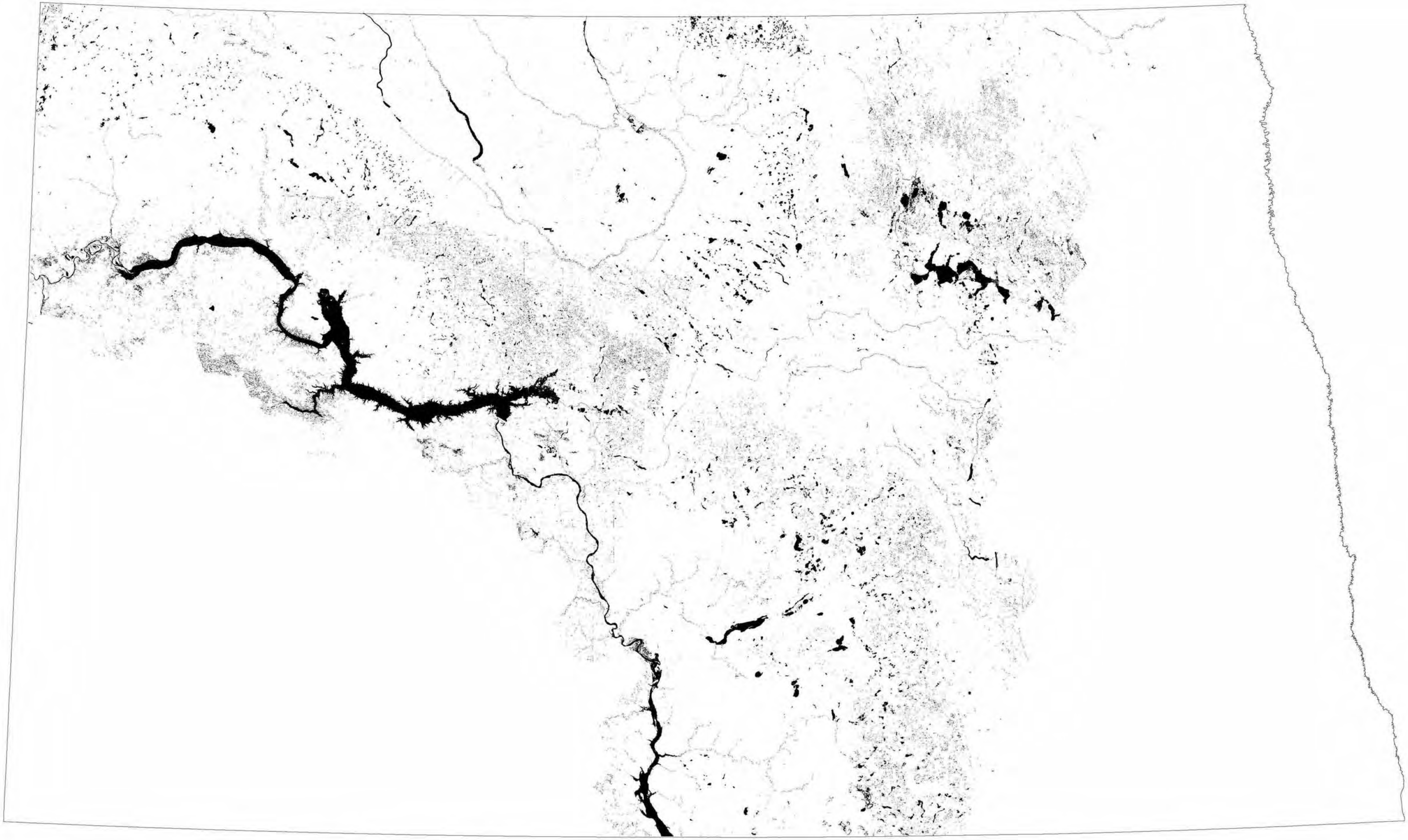
AMERICAN AVOCET(Recurvirostra americana)



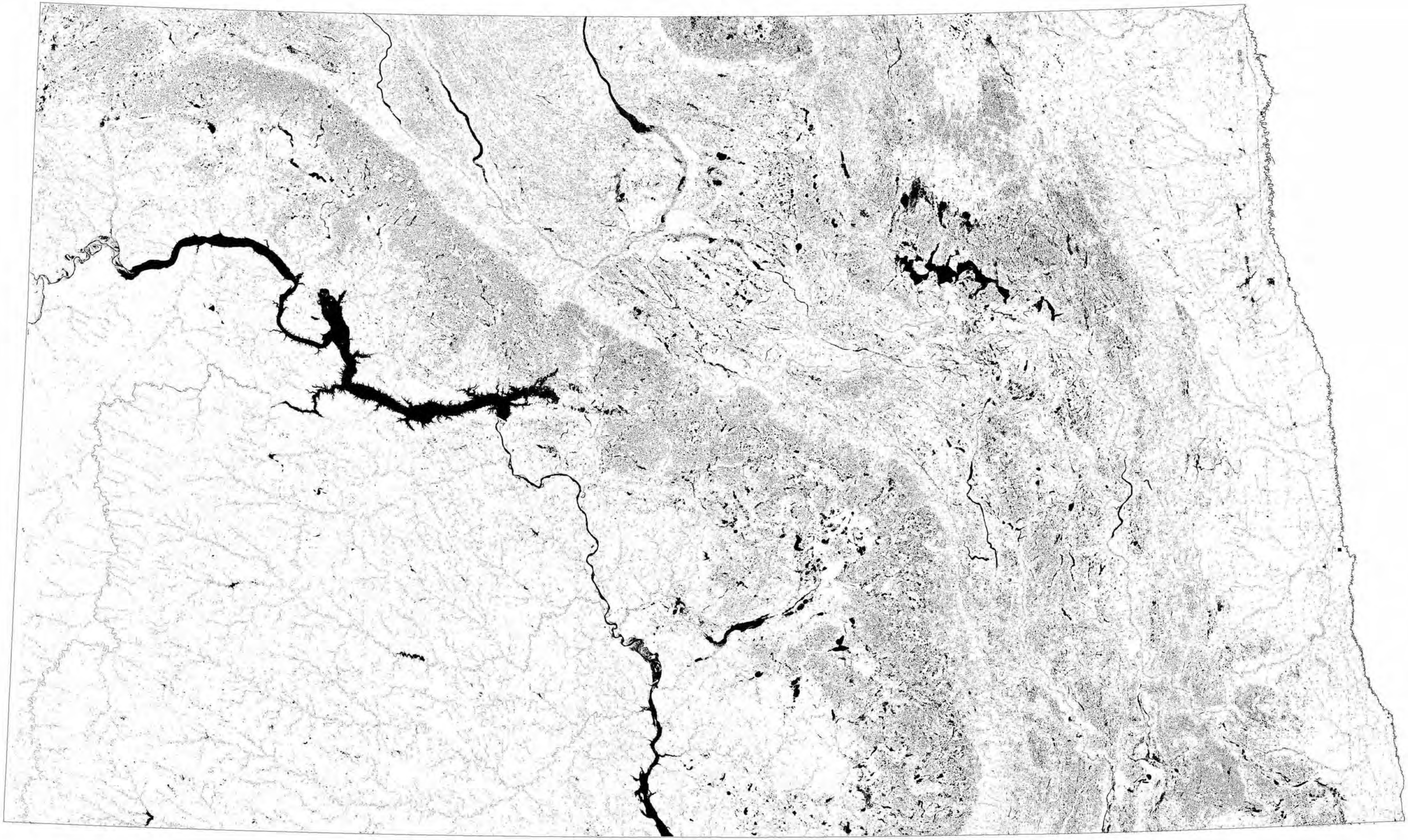
KILLDEER(Charadrius vociferus)



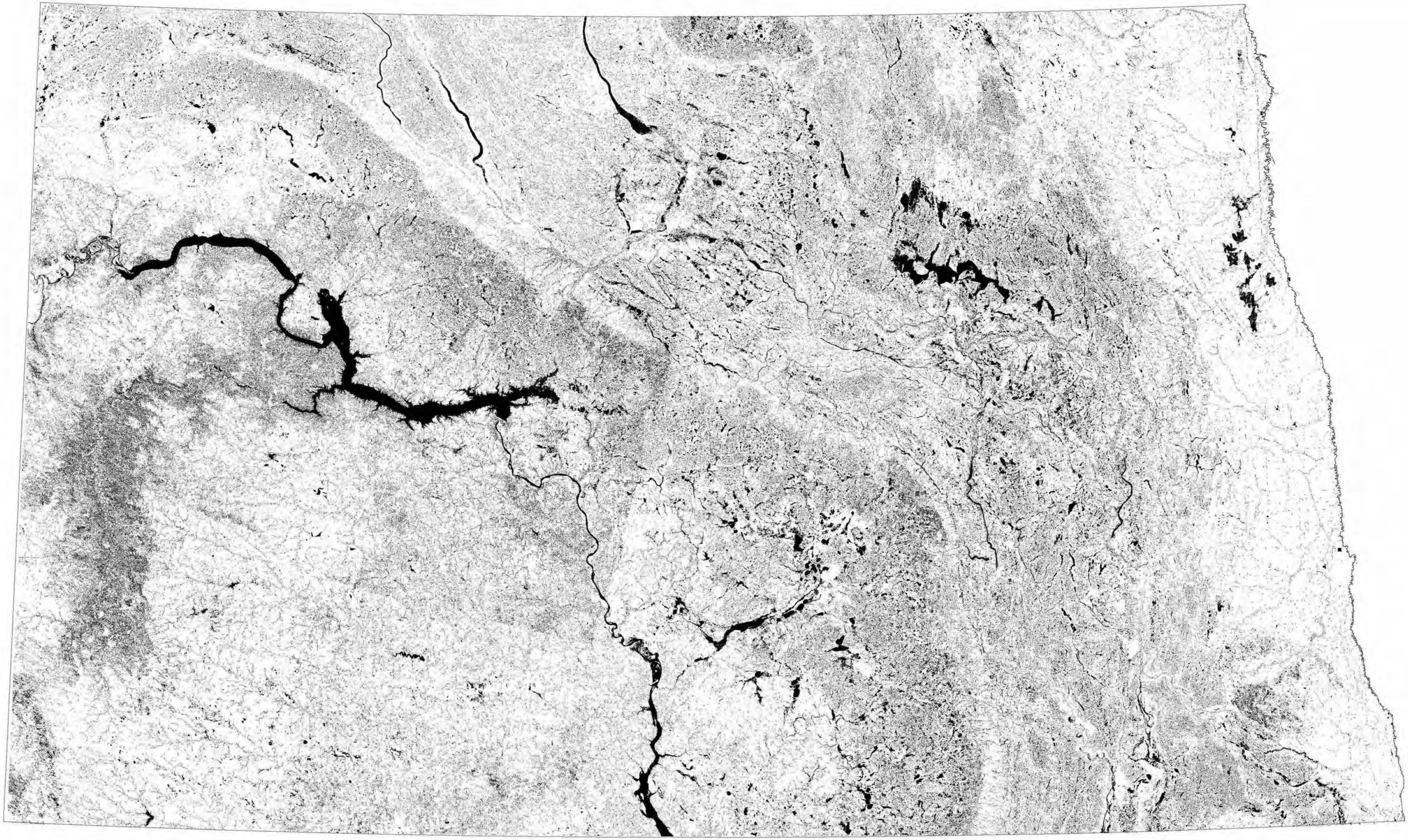
PIPING PLOVER(Charadrius melodus)



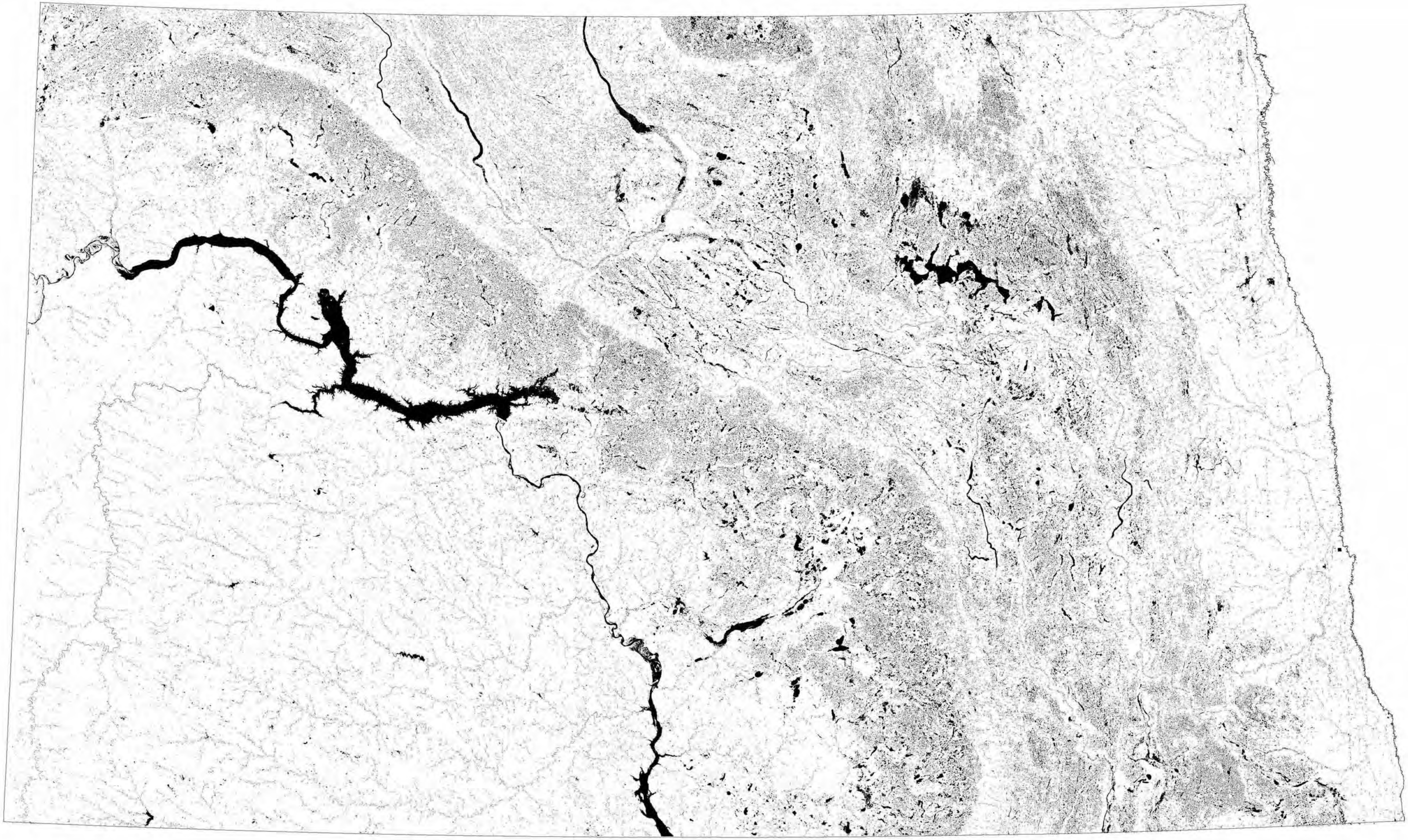
AMERICAN COOT(Fulica americana)



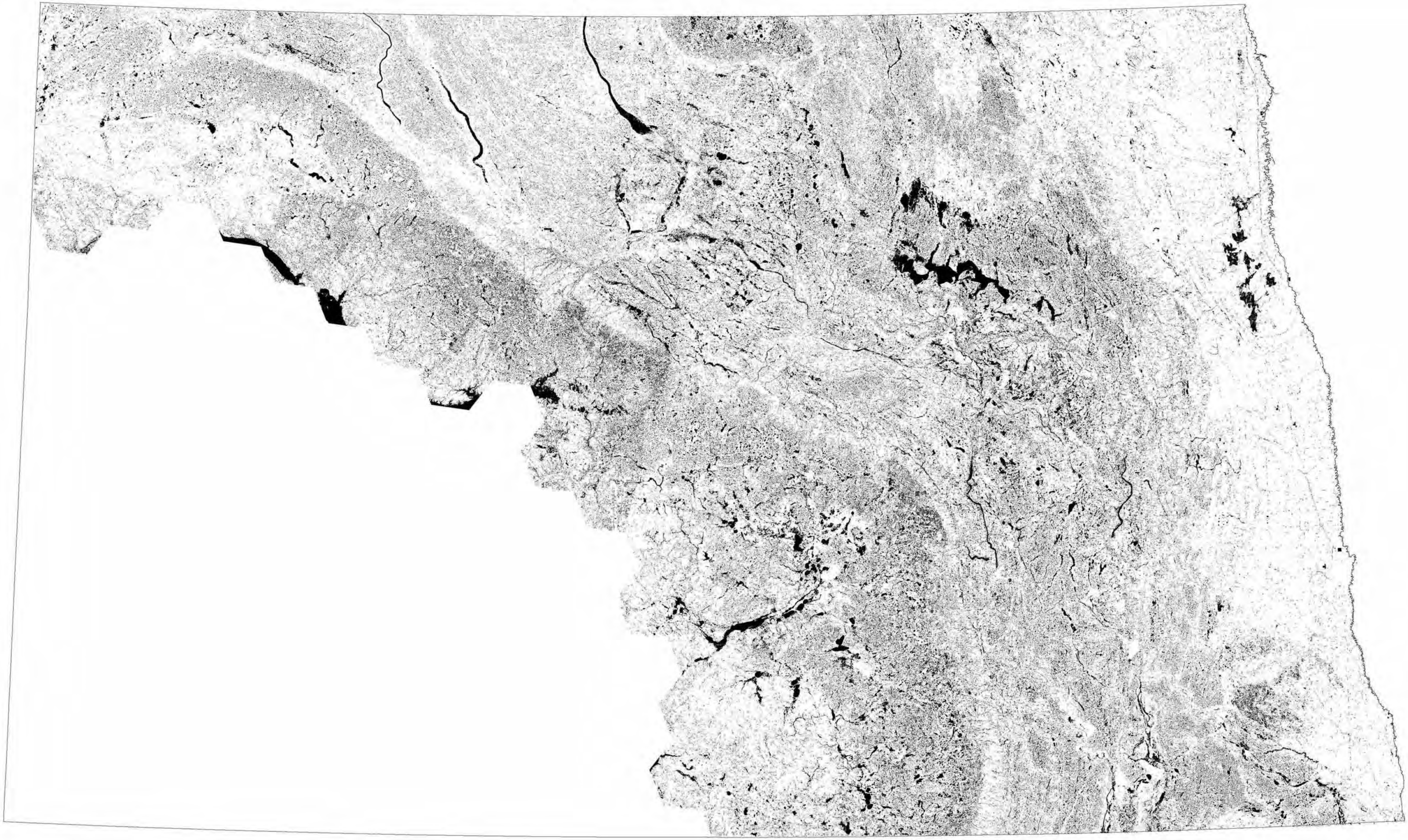
SORA(Porzana carolina)



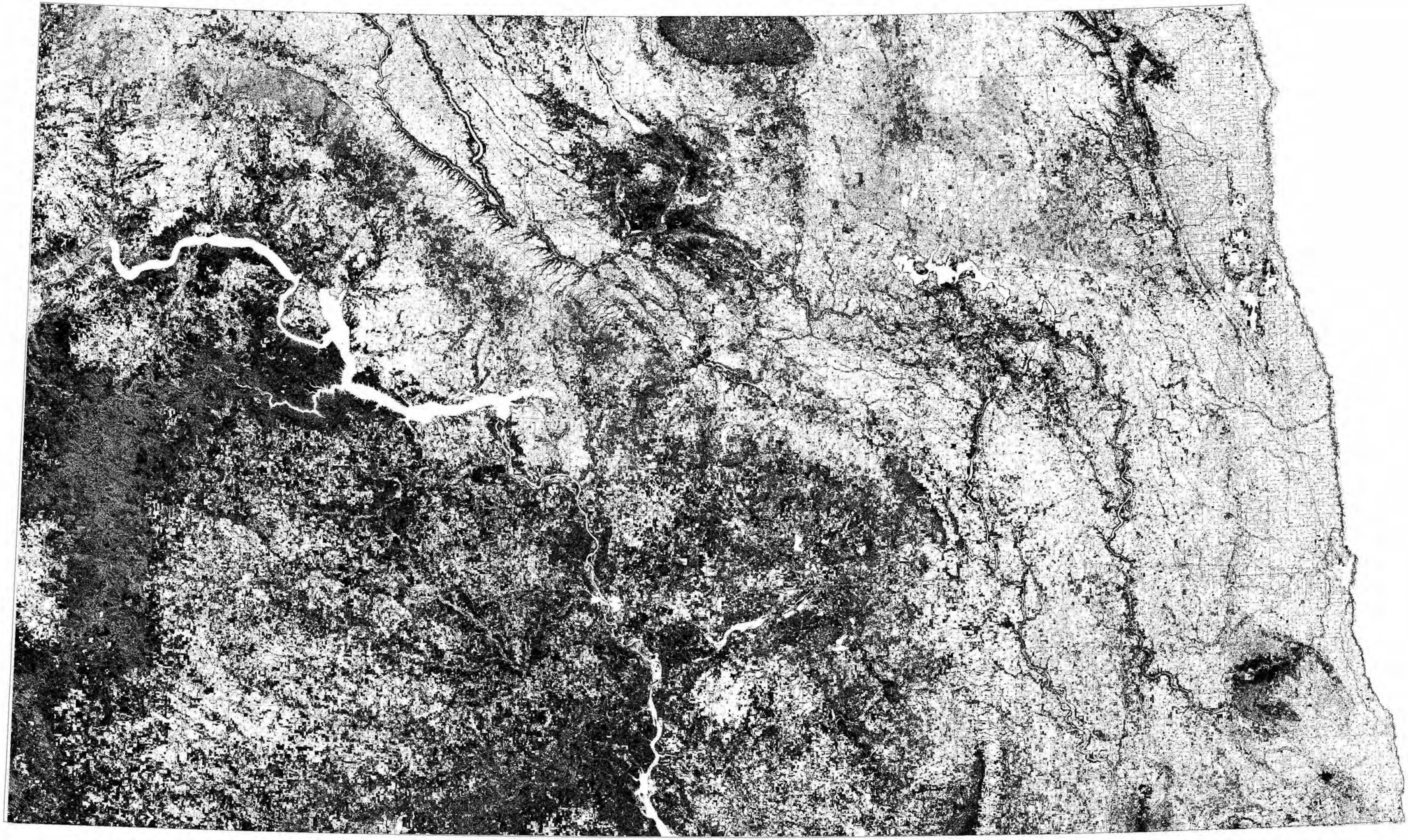
VIRGINIA RAIL(Rallus limicola)



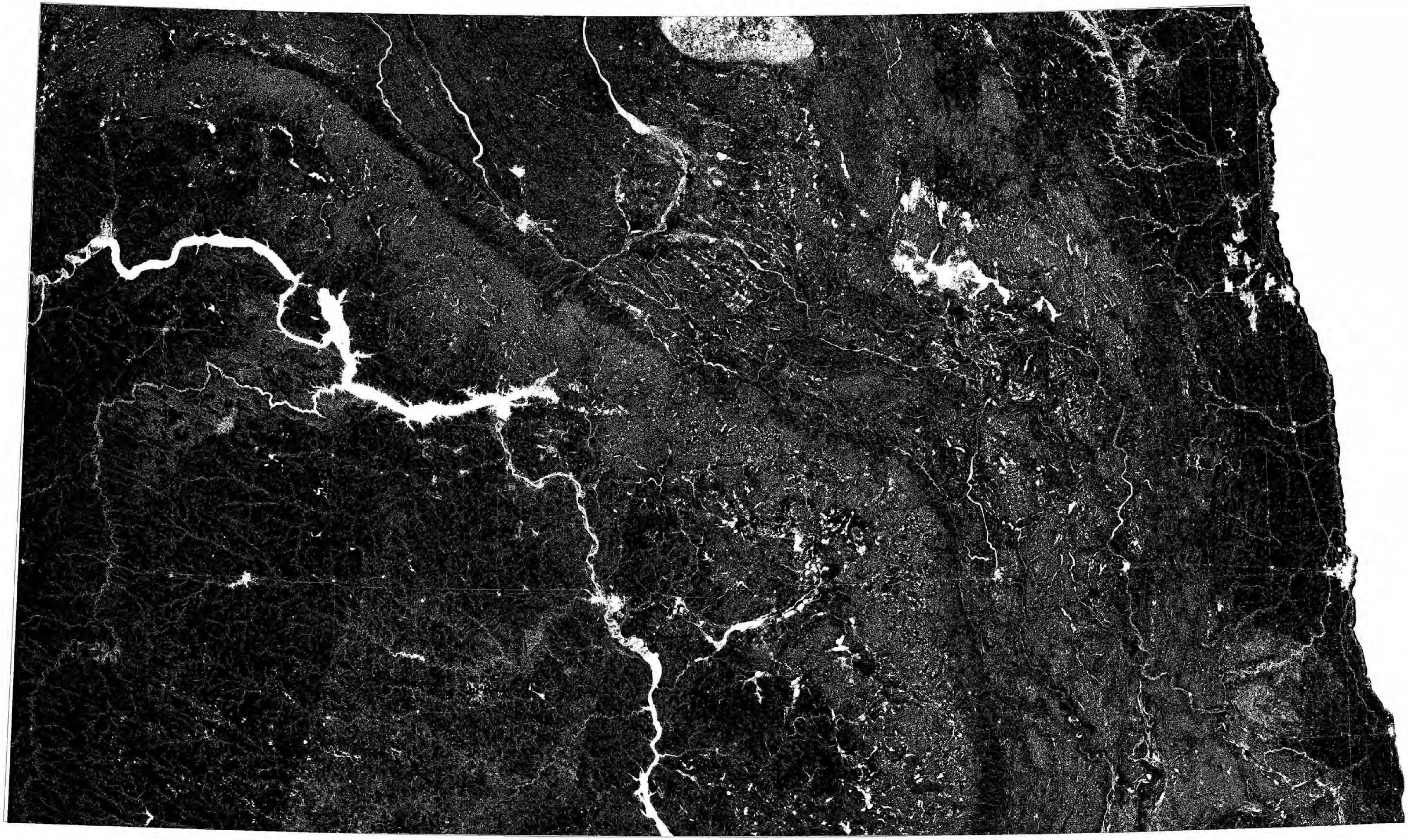
YELLOW RAIL(Coturnicops noveboracensis)



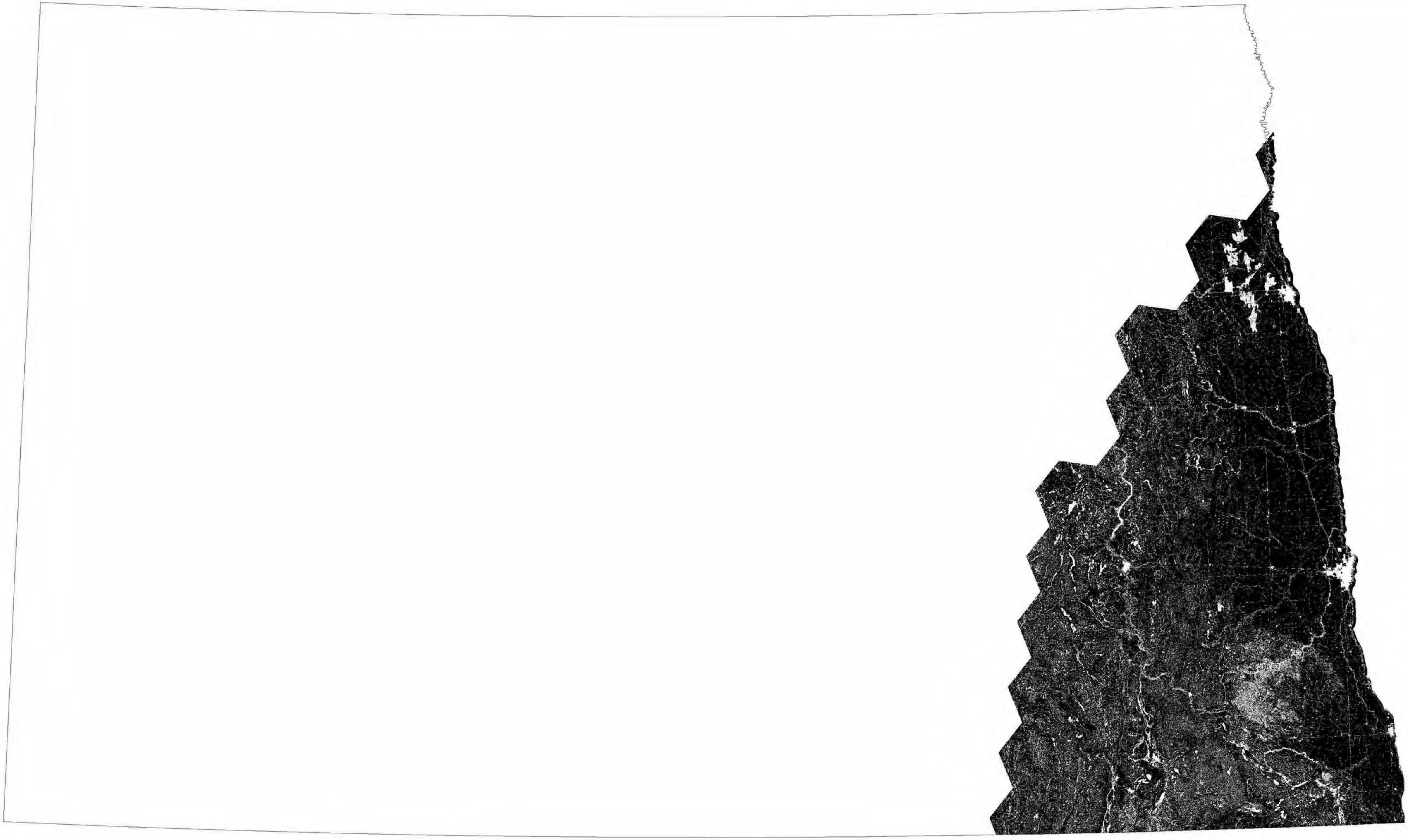
WILD TURKEY(Meleagris gallopavo)



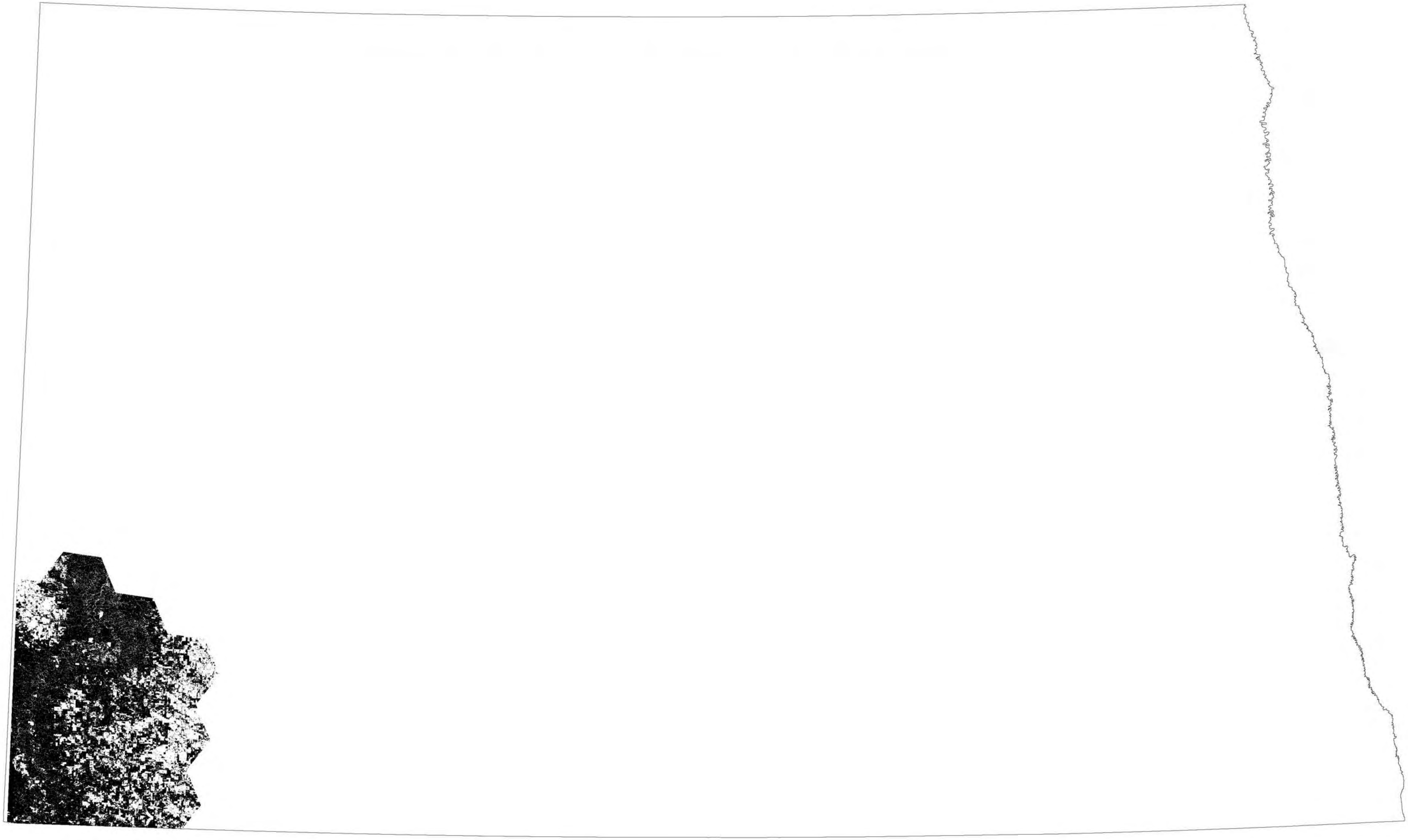
SHARP-TAILED GROUSE(Tympanuchus phasianellus)



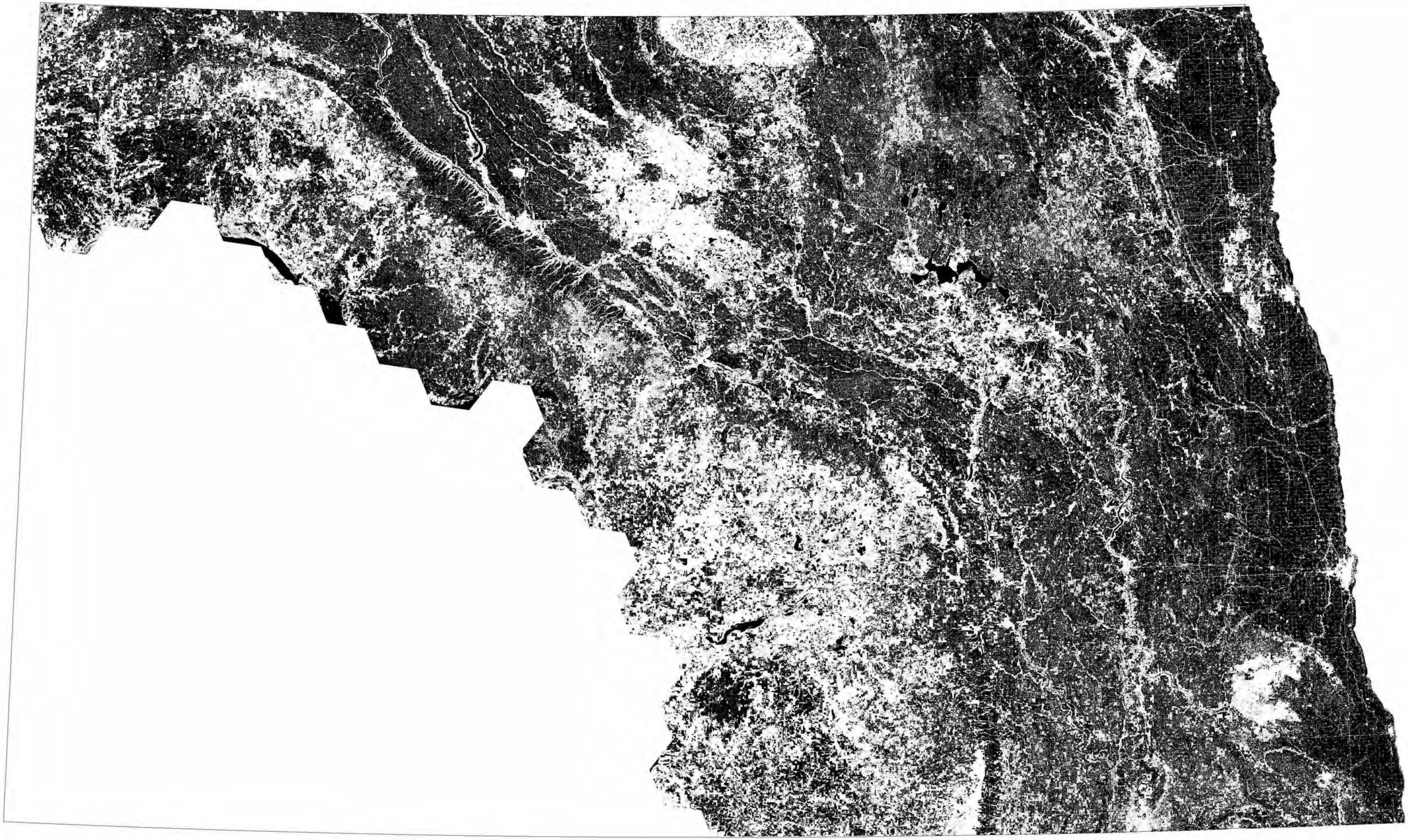
GREATER PRAIRIE-CHICKEN(Tympanuchus cupido)



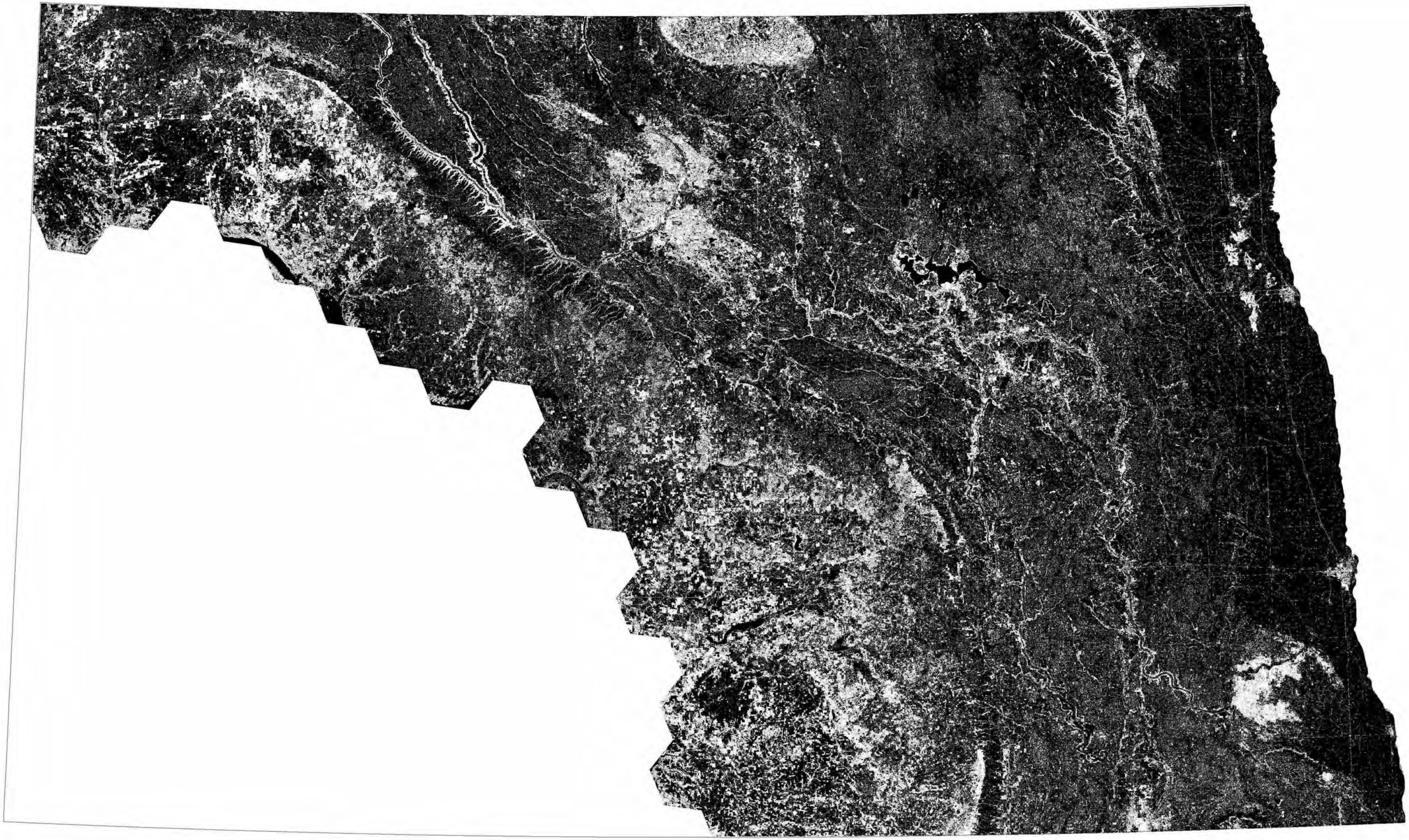
SAGE GROUSE(Centrocercus urophasianus)



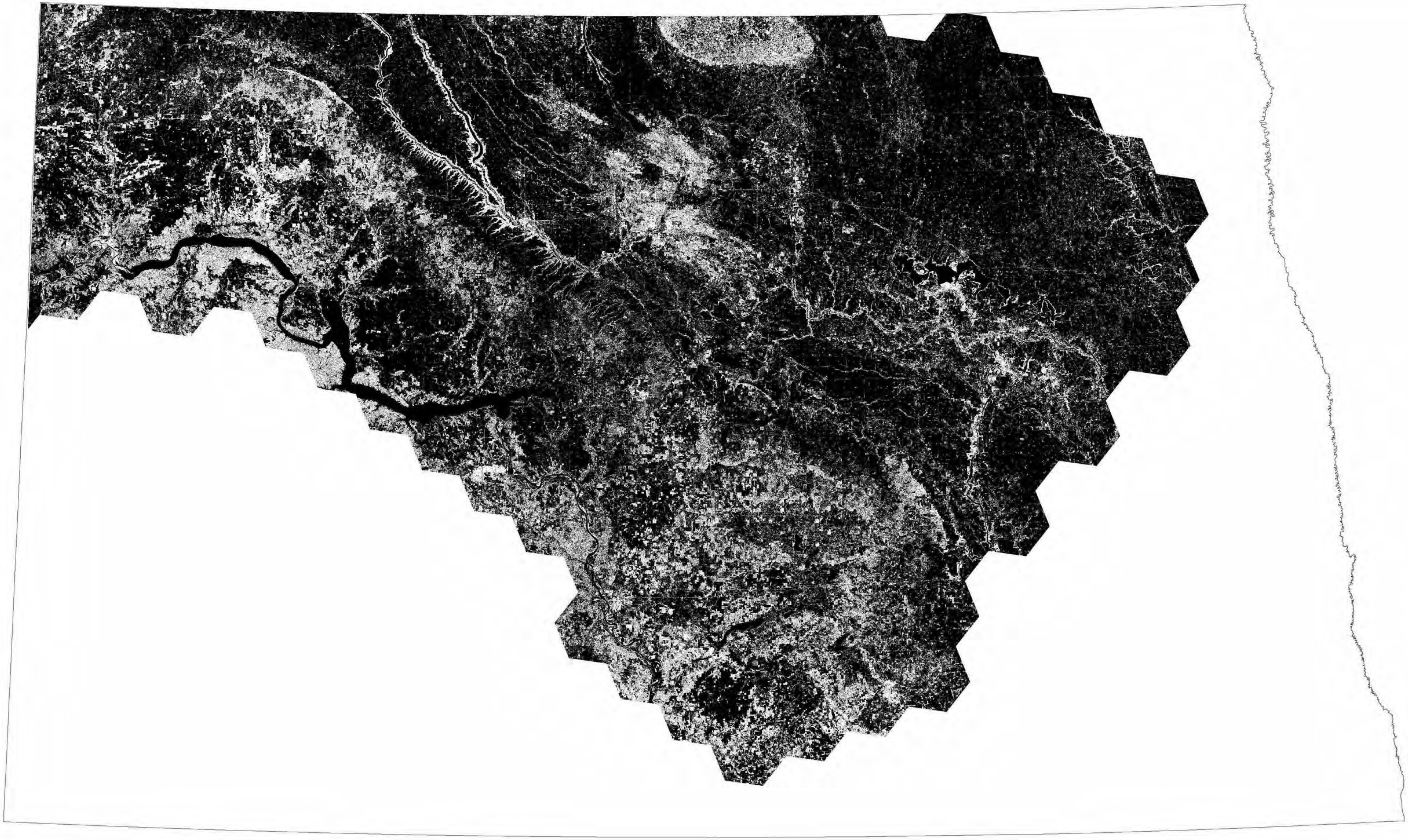
FRANKLIN'S GULL(Larus pipixcan)



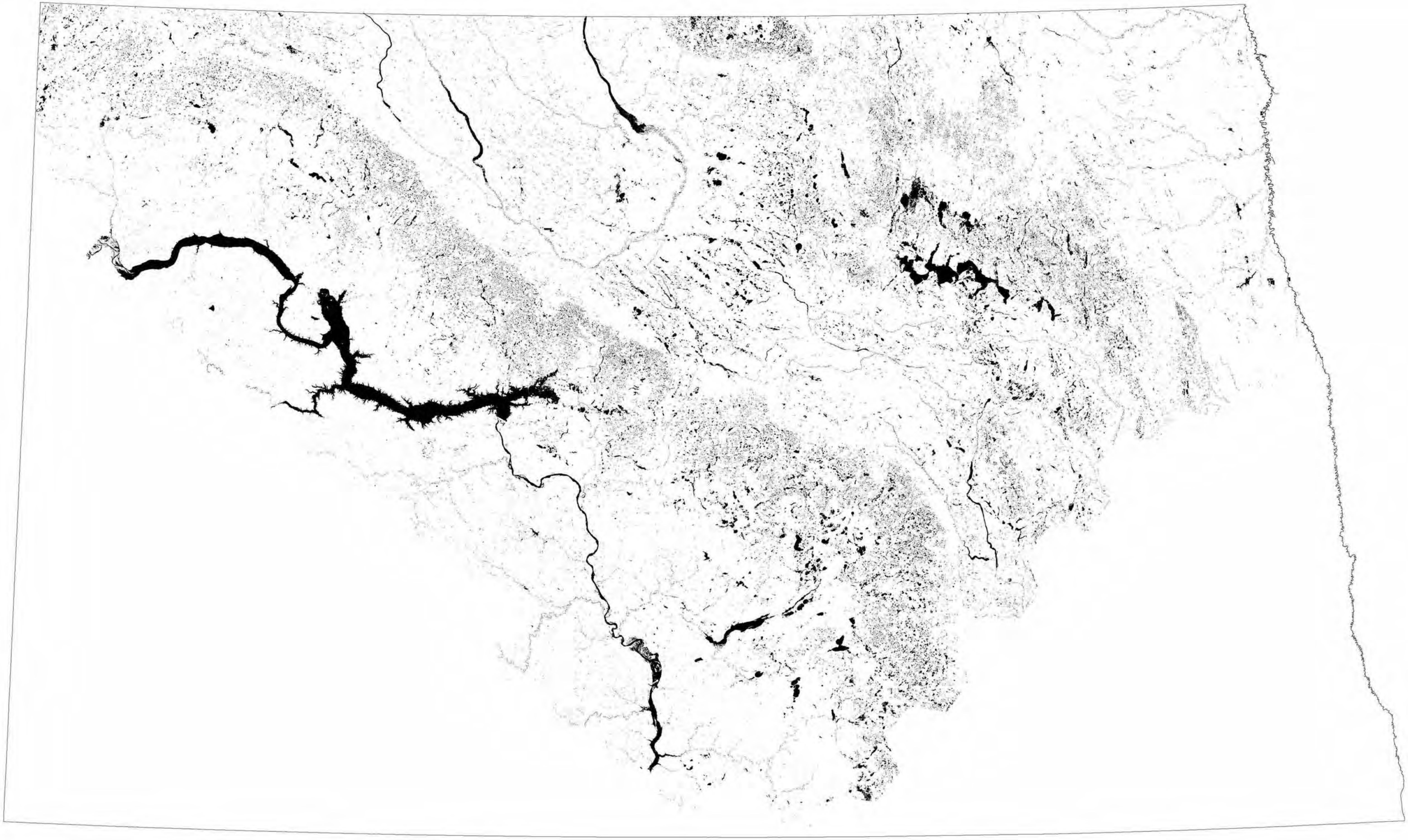
RING-BILLED GULL(Larus delawarensis)



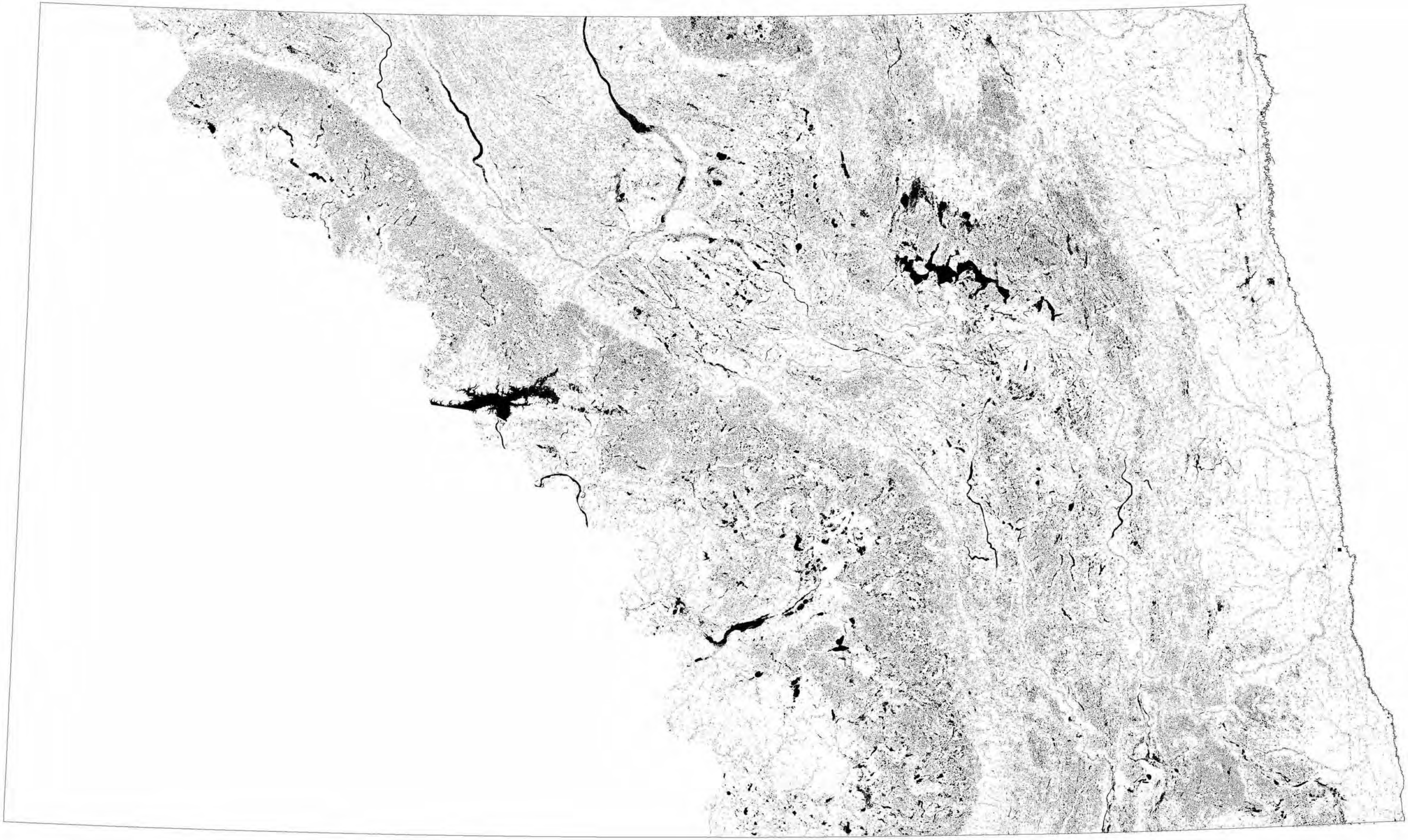
CALIFORNIA GULL(Larus californicus)



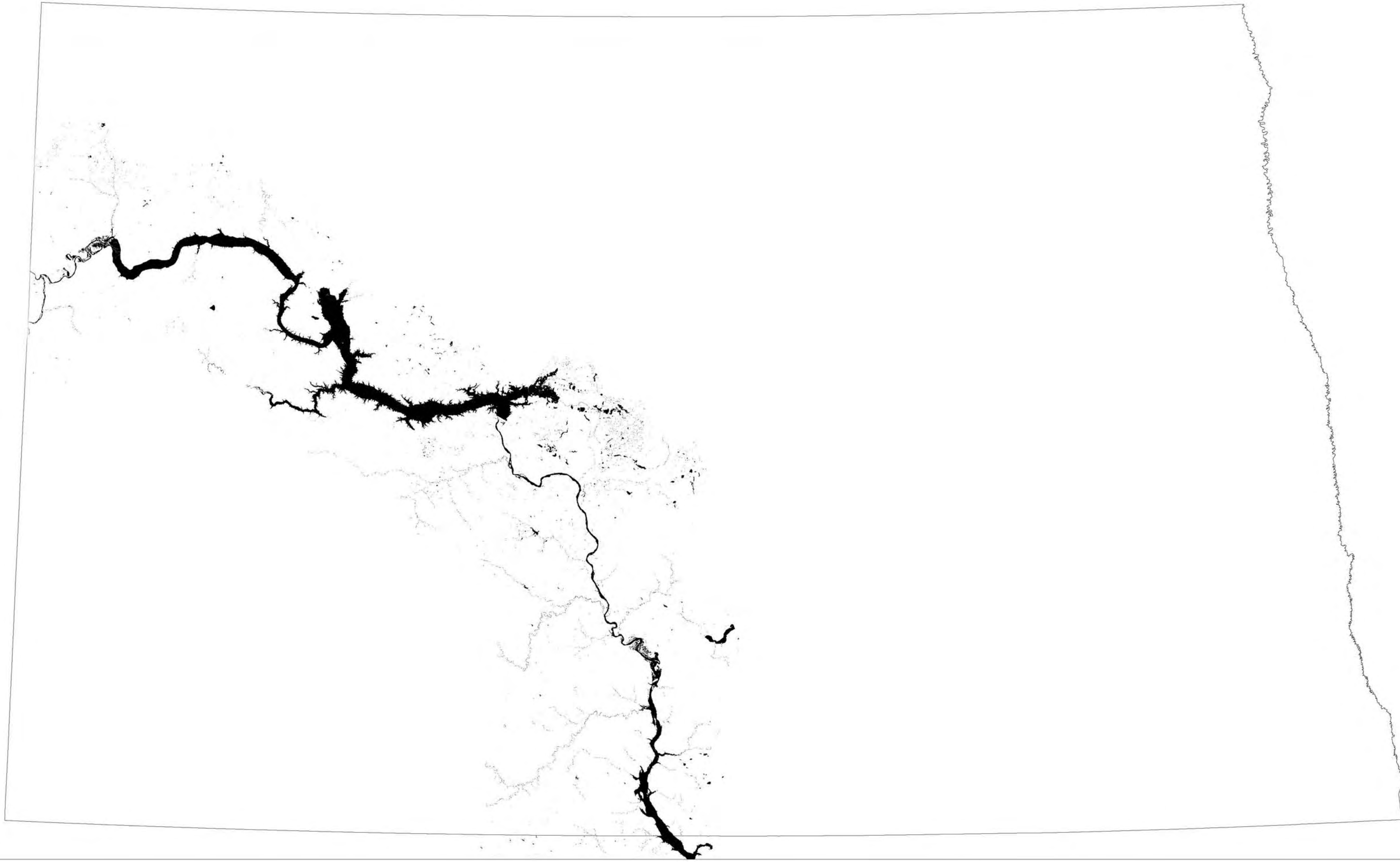
COMMON TERN(Sterna hirundo)



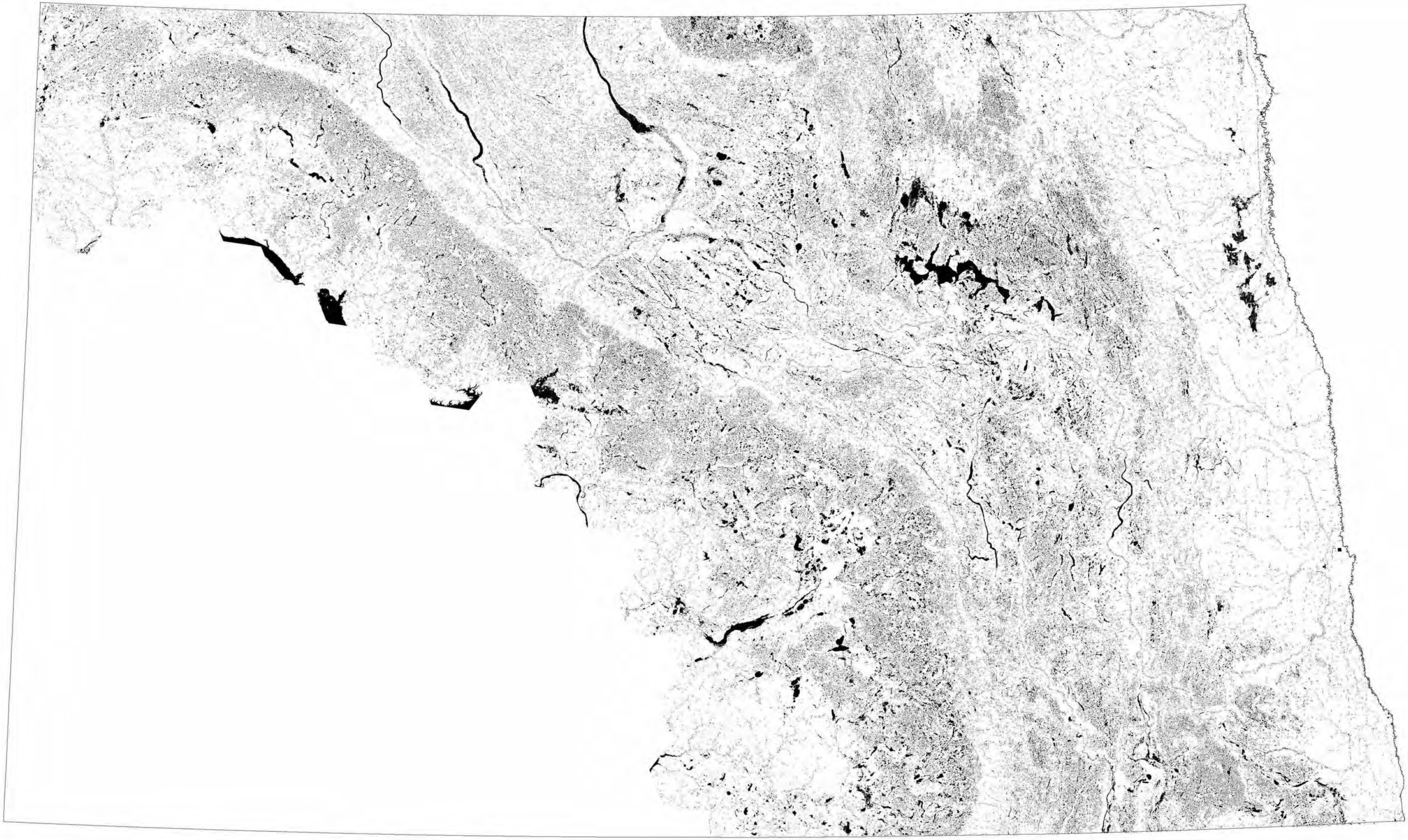
FORSTER'S TERN(Sterna forsteri)



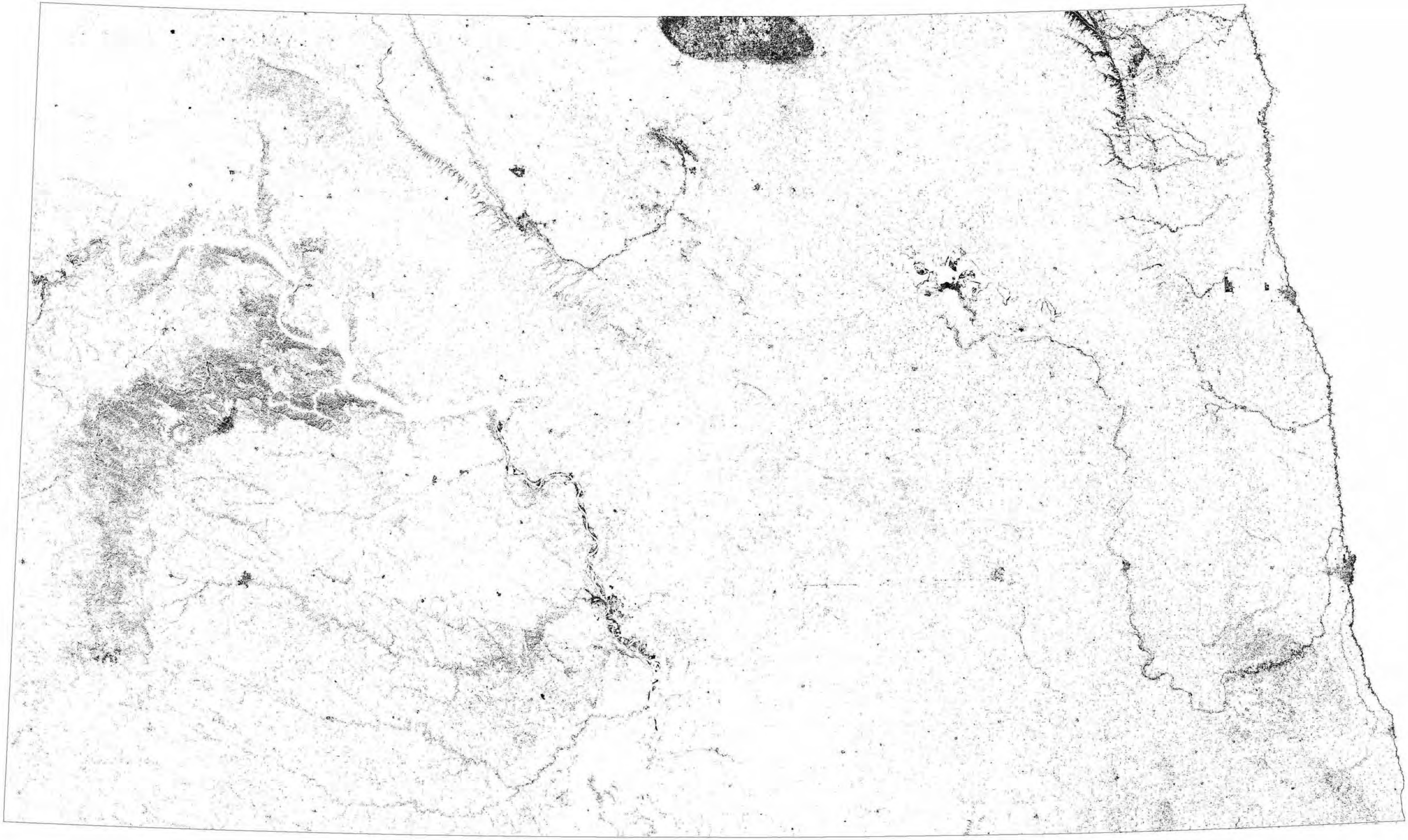
LEAST TERN(Sterna antillarum)



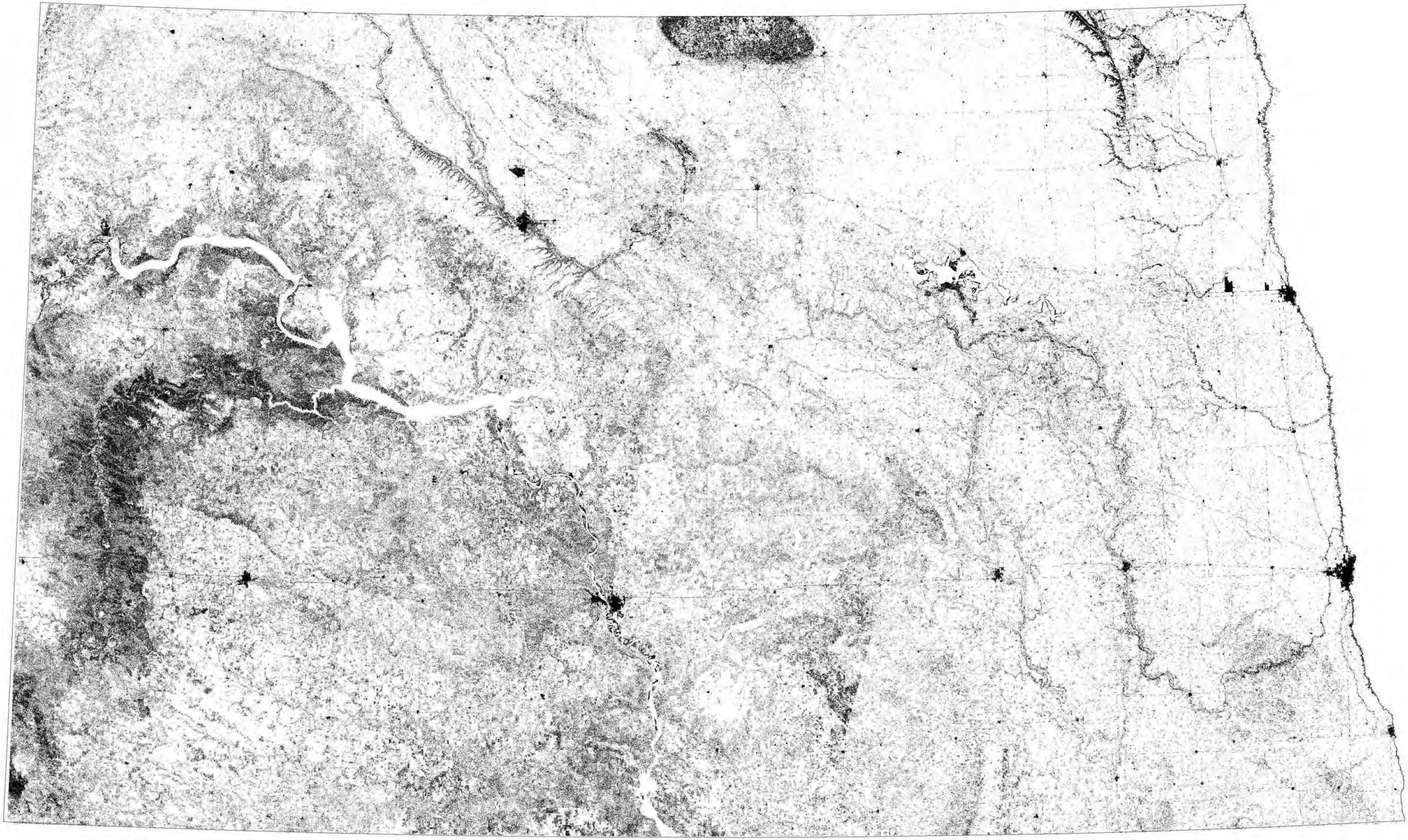
BLACK TERN(Chlidonias niger)



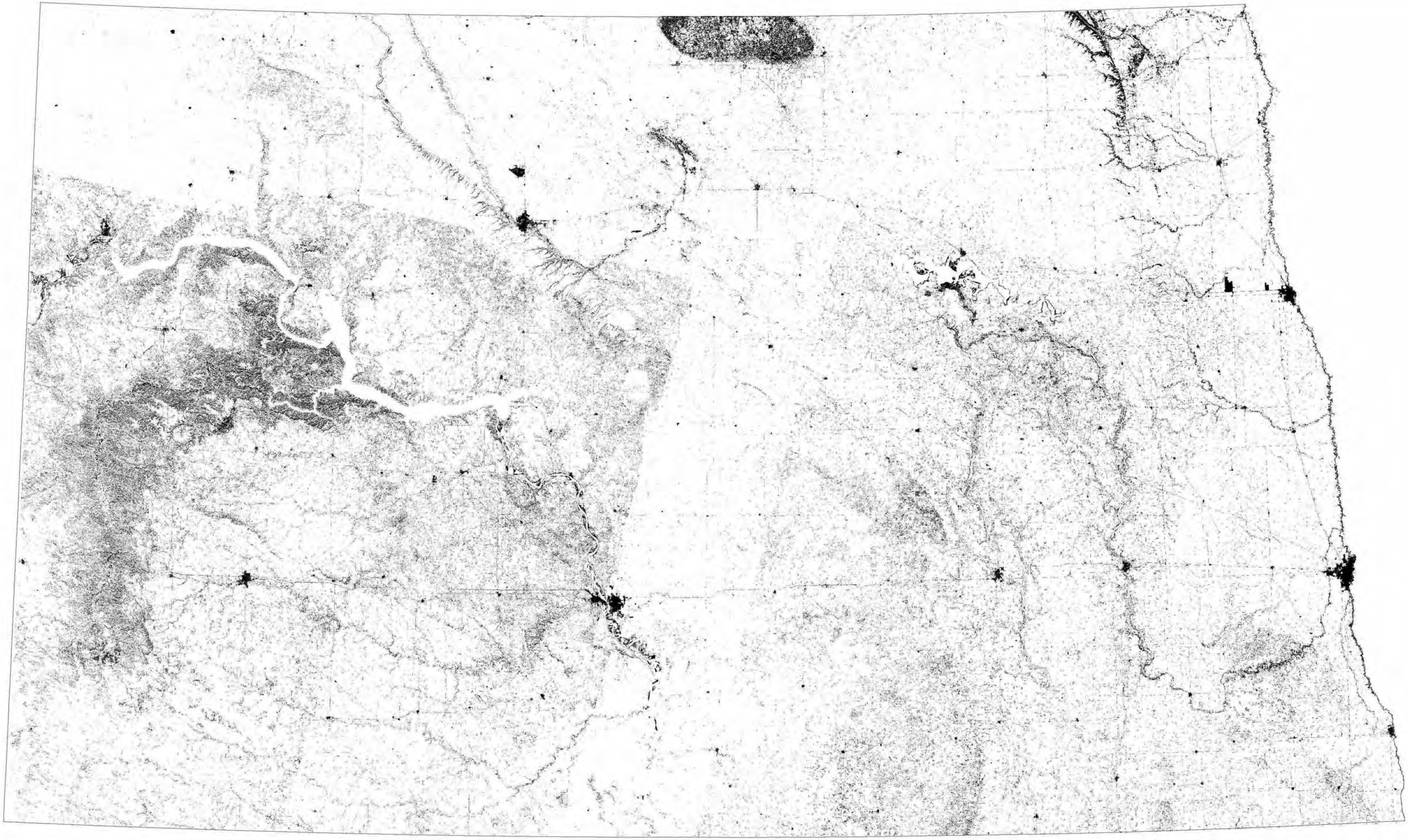
MOURNING DOVE(Zenaida macroura)



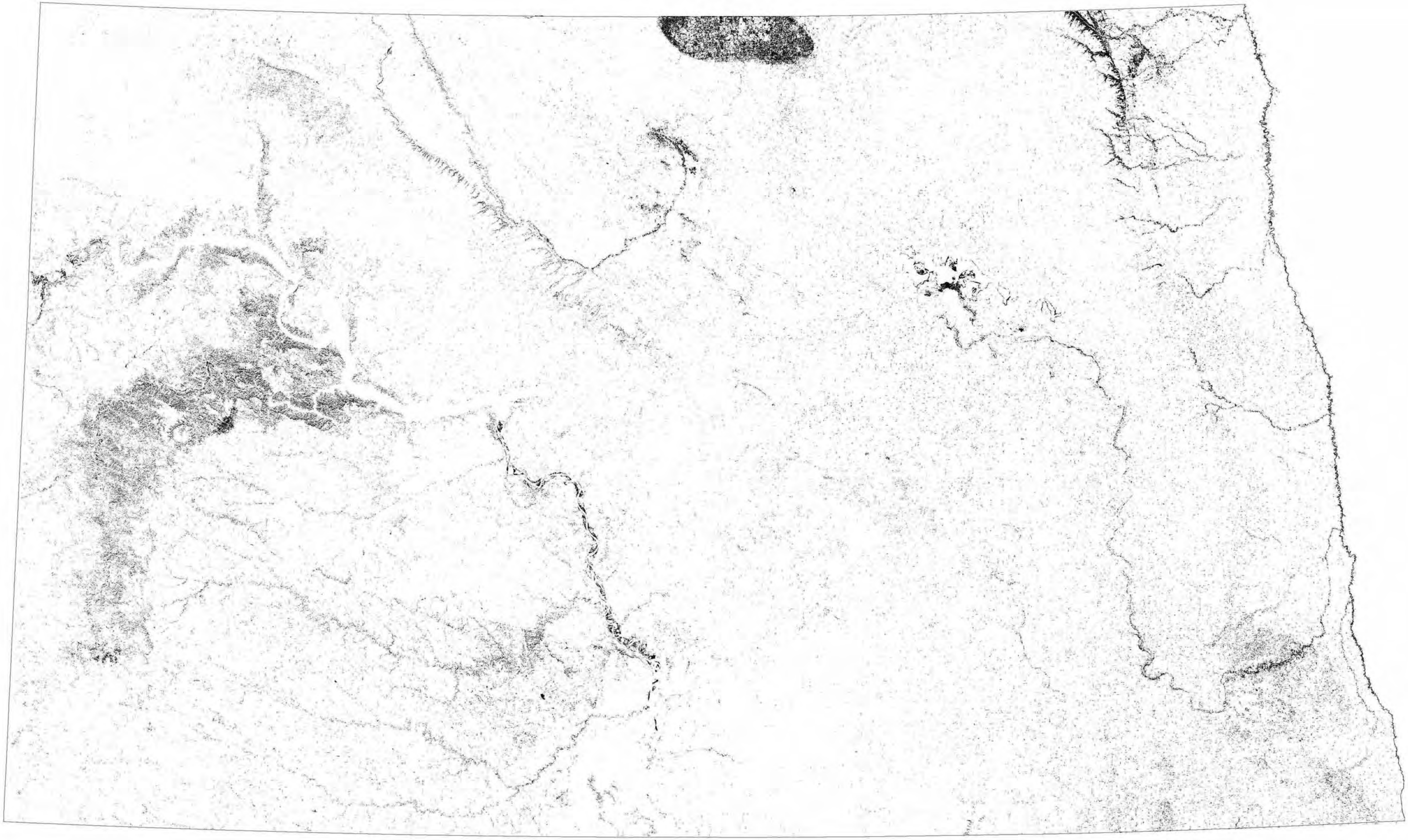
BLACK-BILLED CUCKOO(Coccyzus erythropthalmus)



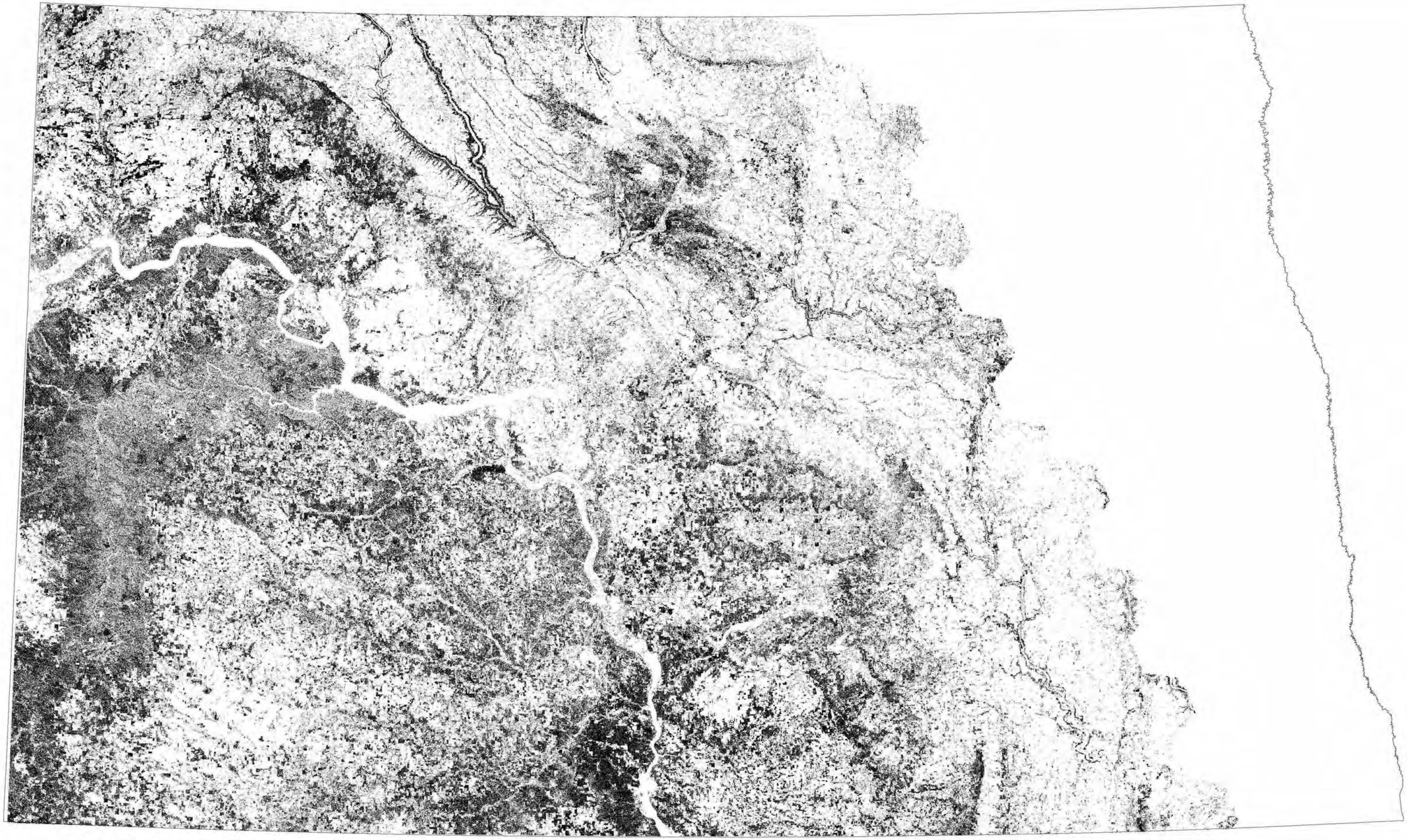
EASTERN SCREECH-OWL(Otus asio)



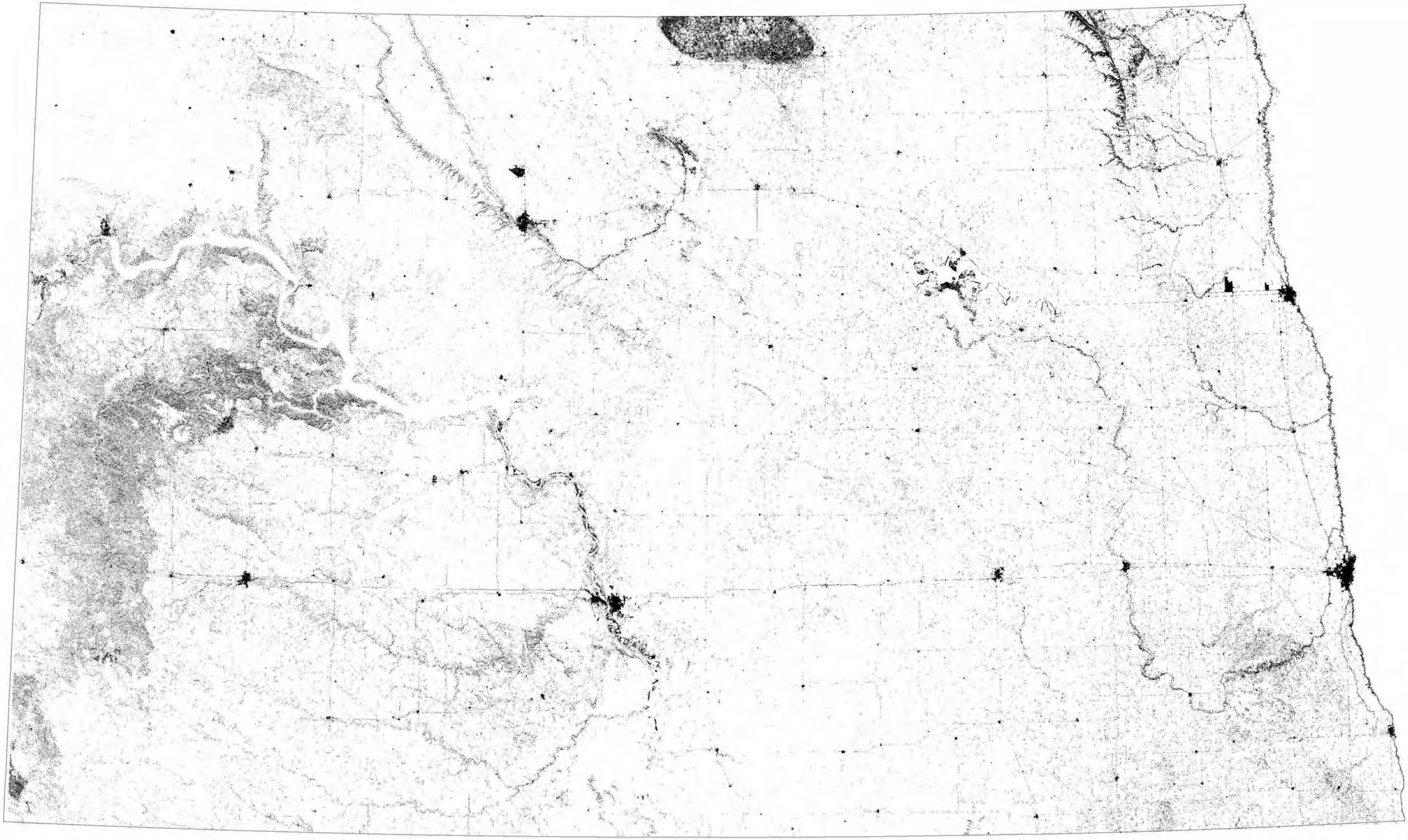
GREAT HORNED OWL(Bubo virginianus)



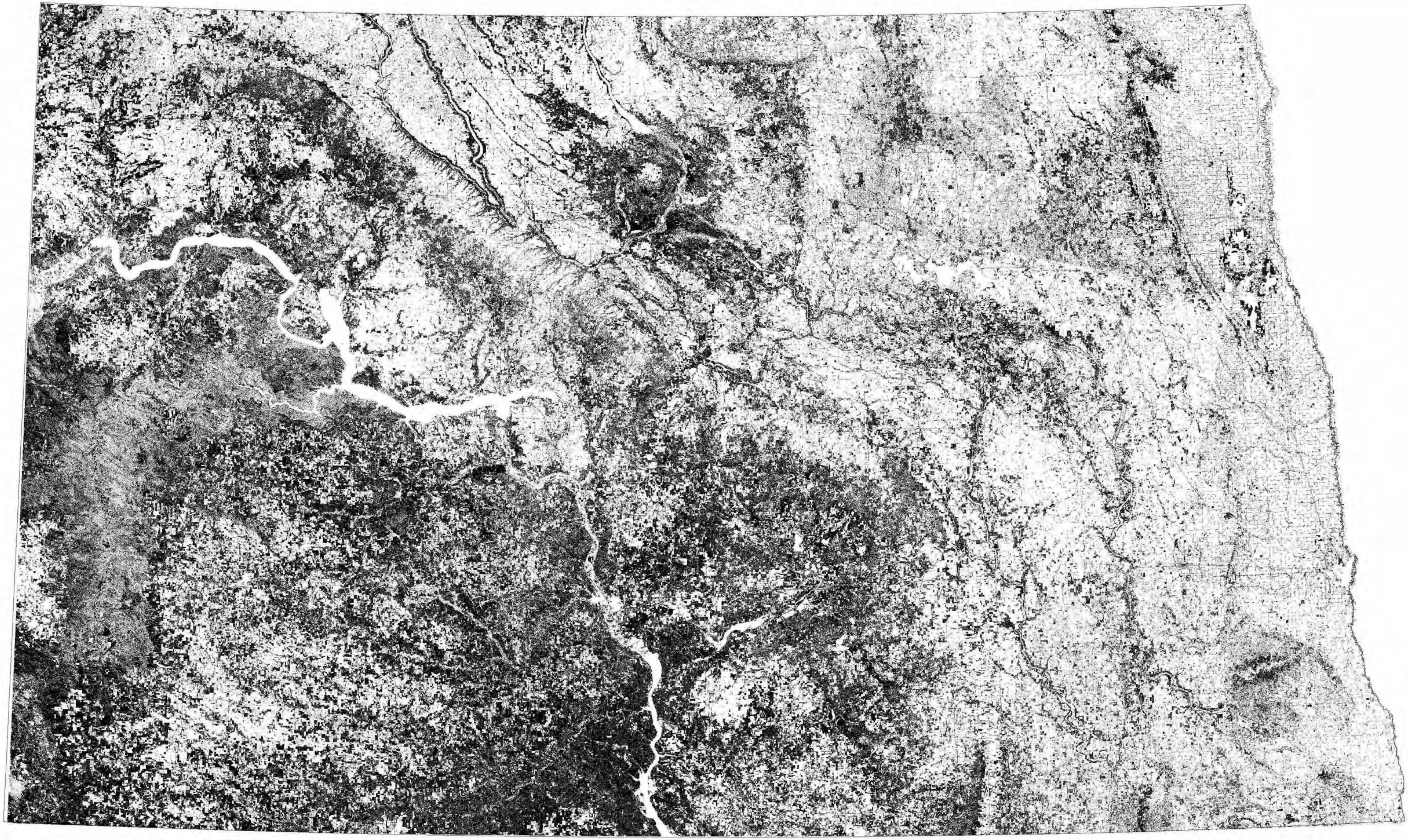
BURROWING OWL(Athene cunicularia)



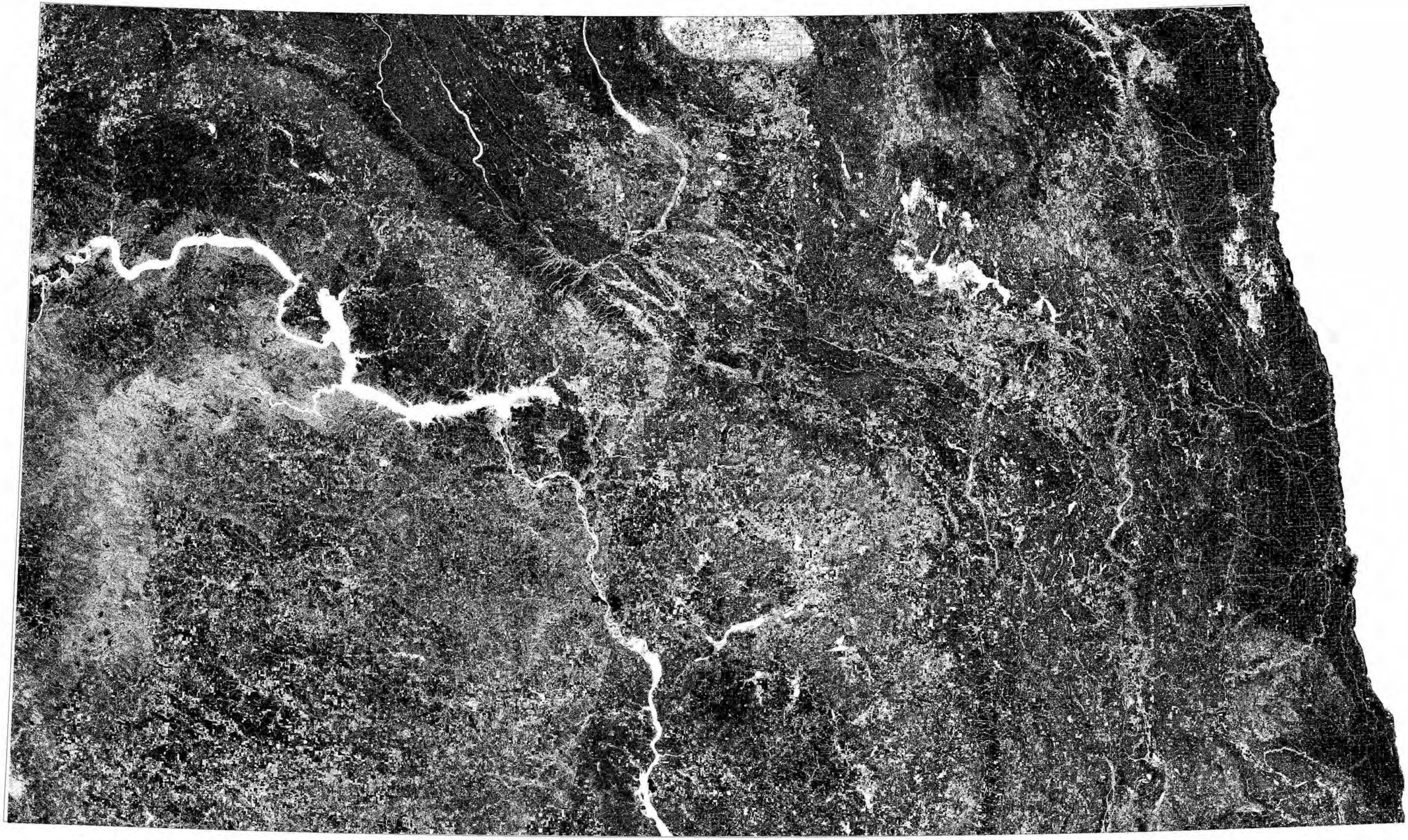
LONG-EARED OWL(Asio otus)



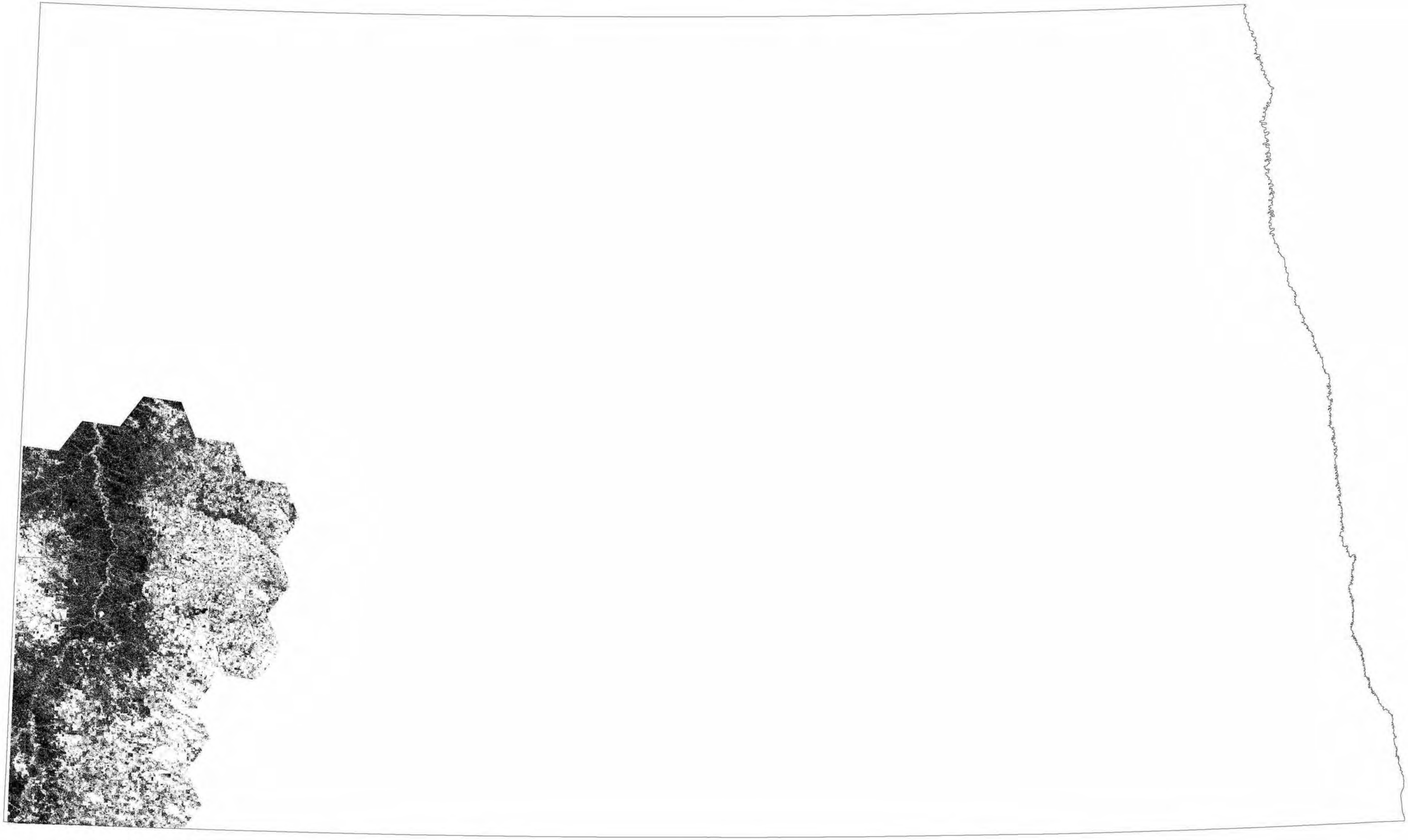
SHORT-EARED OWL(Asio flammeus)



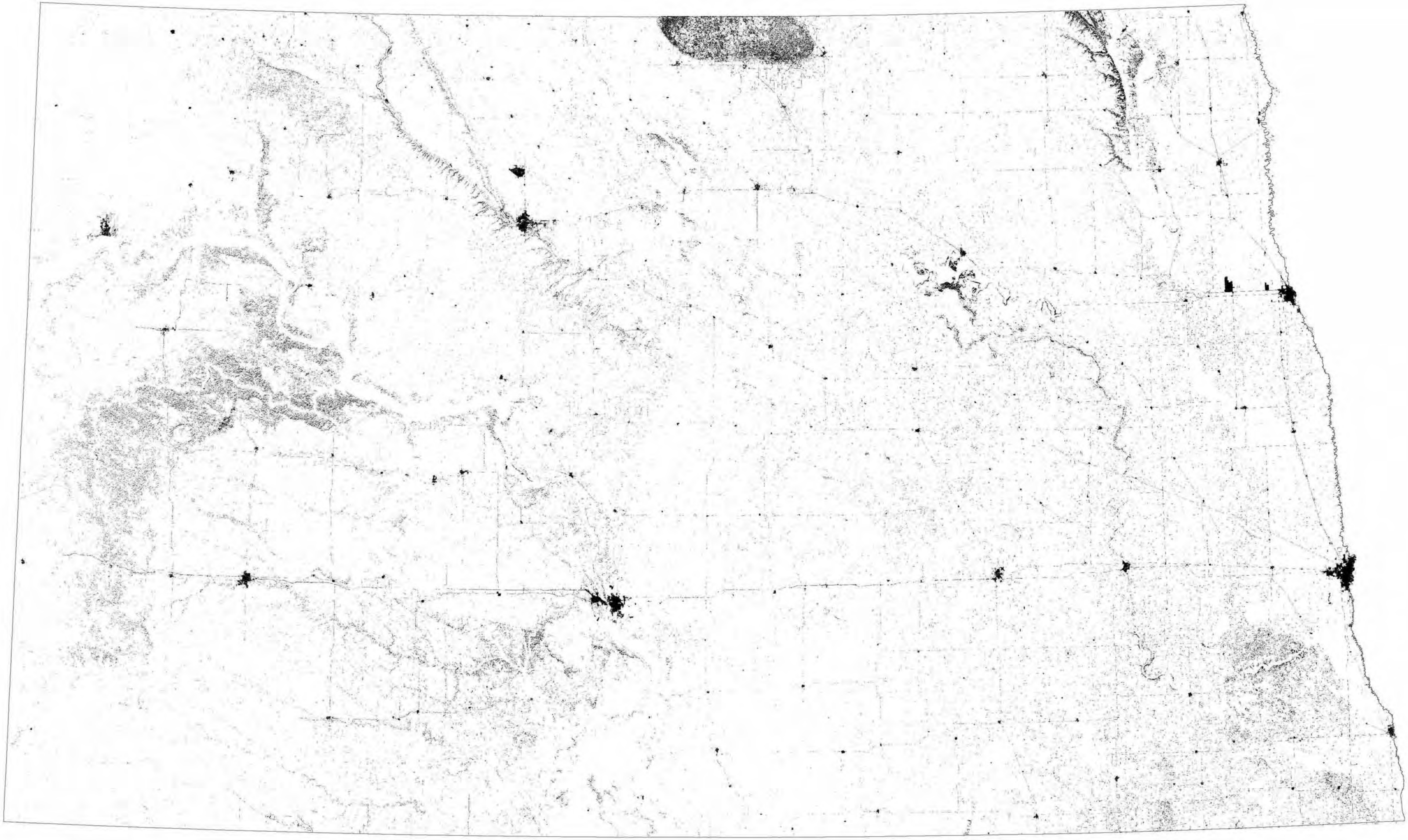
COMMON NIGHTHAWK(Chordeiles minor)



COMMON POORWILL(Phalaenoptilus nuttallii)

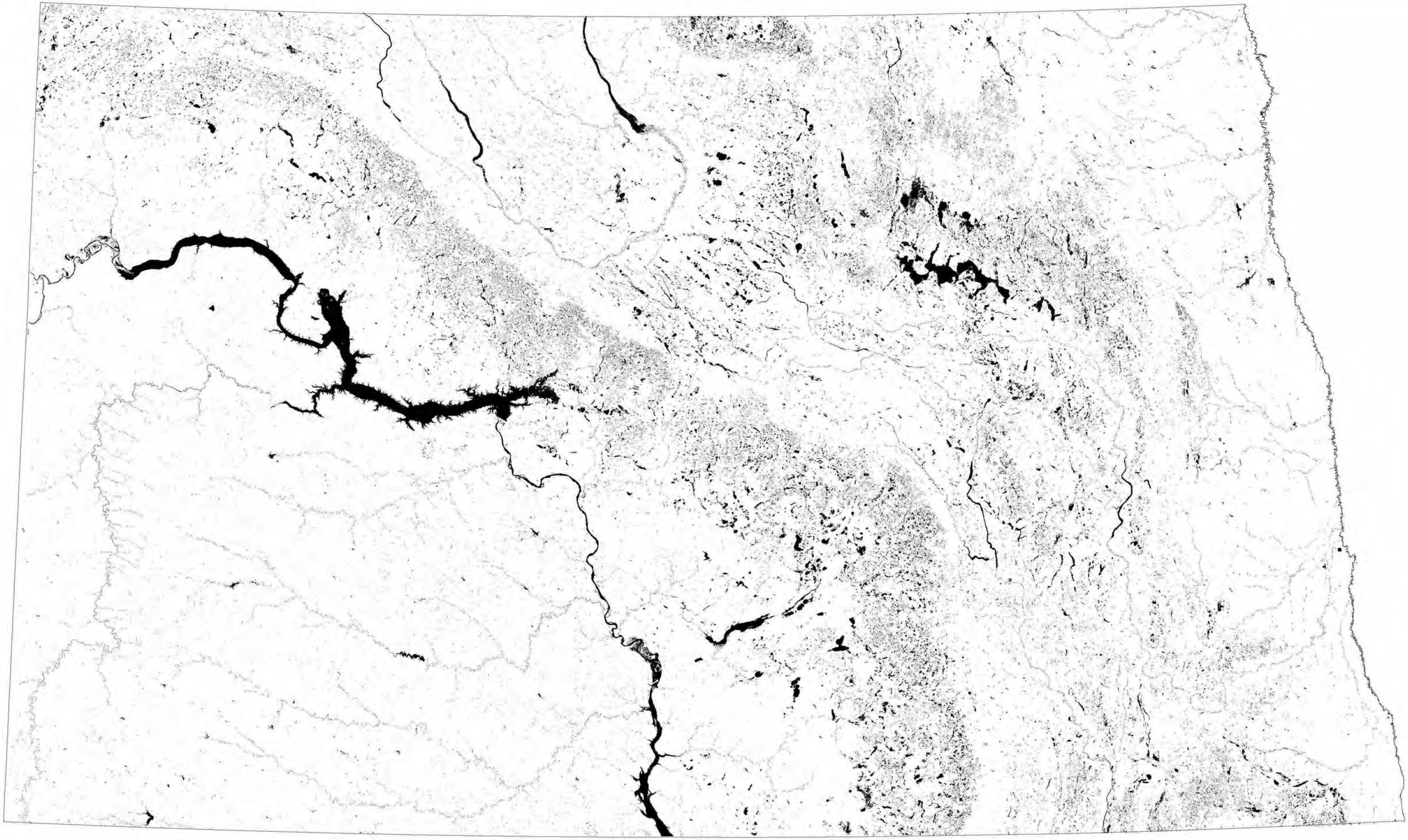


CHIMNEY SWIFT(Chaetura pelagica)

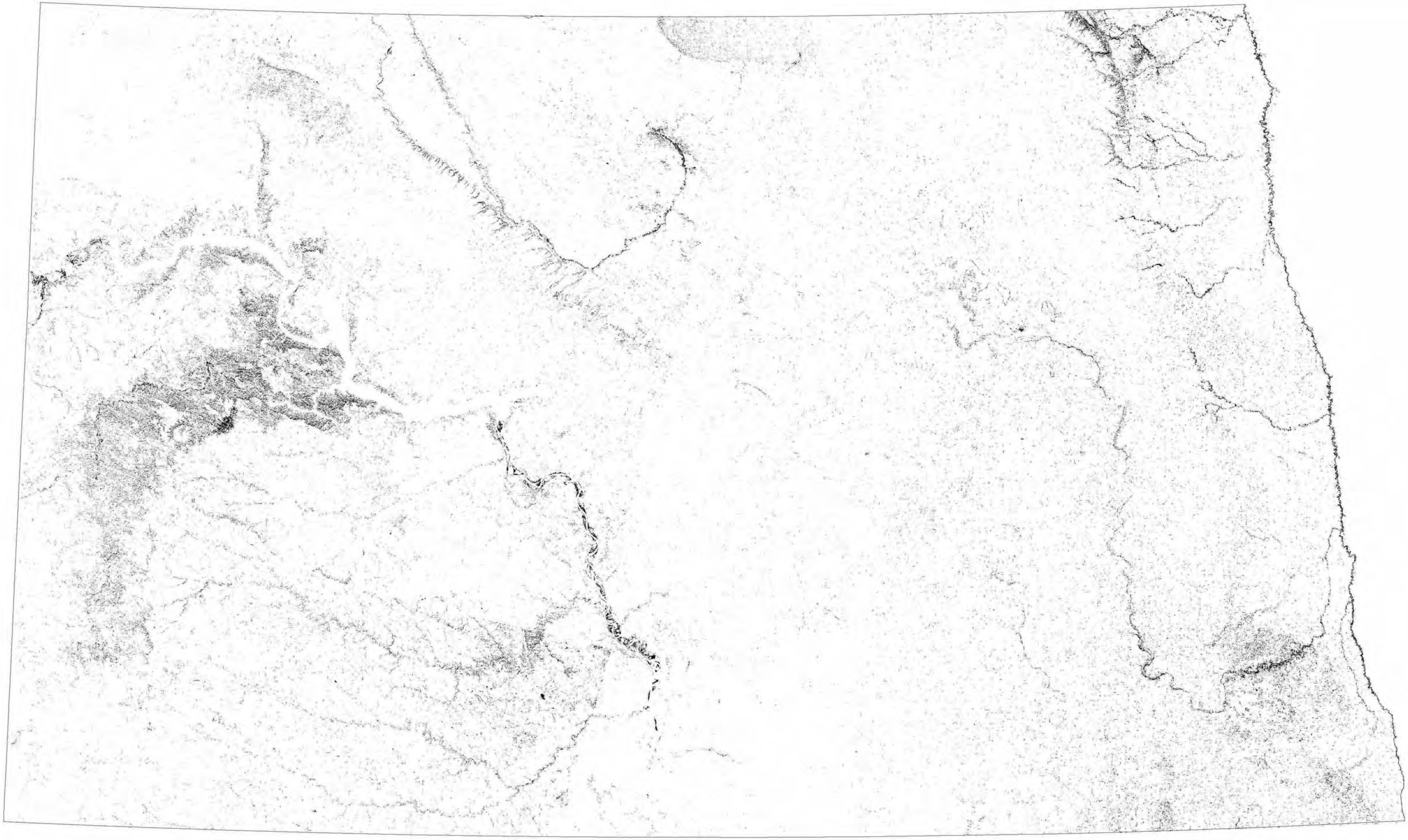


RUBY-THROATED HUMMINGBIRD(Archilochus colubris)

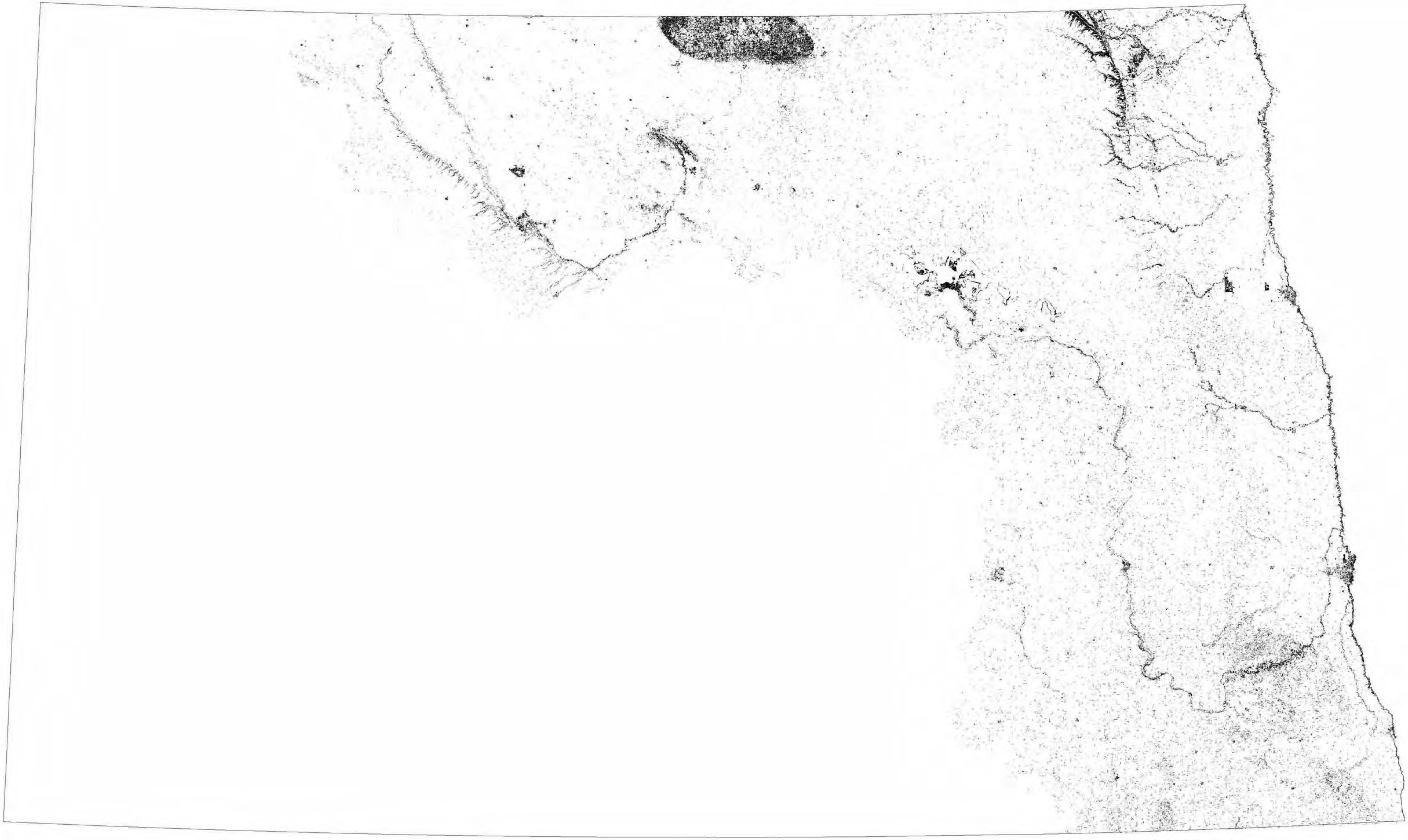
BELTED KINGFISHER(Ceryle alcyon)



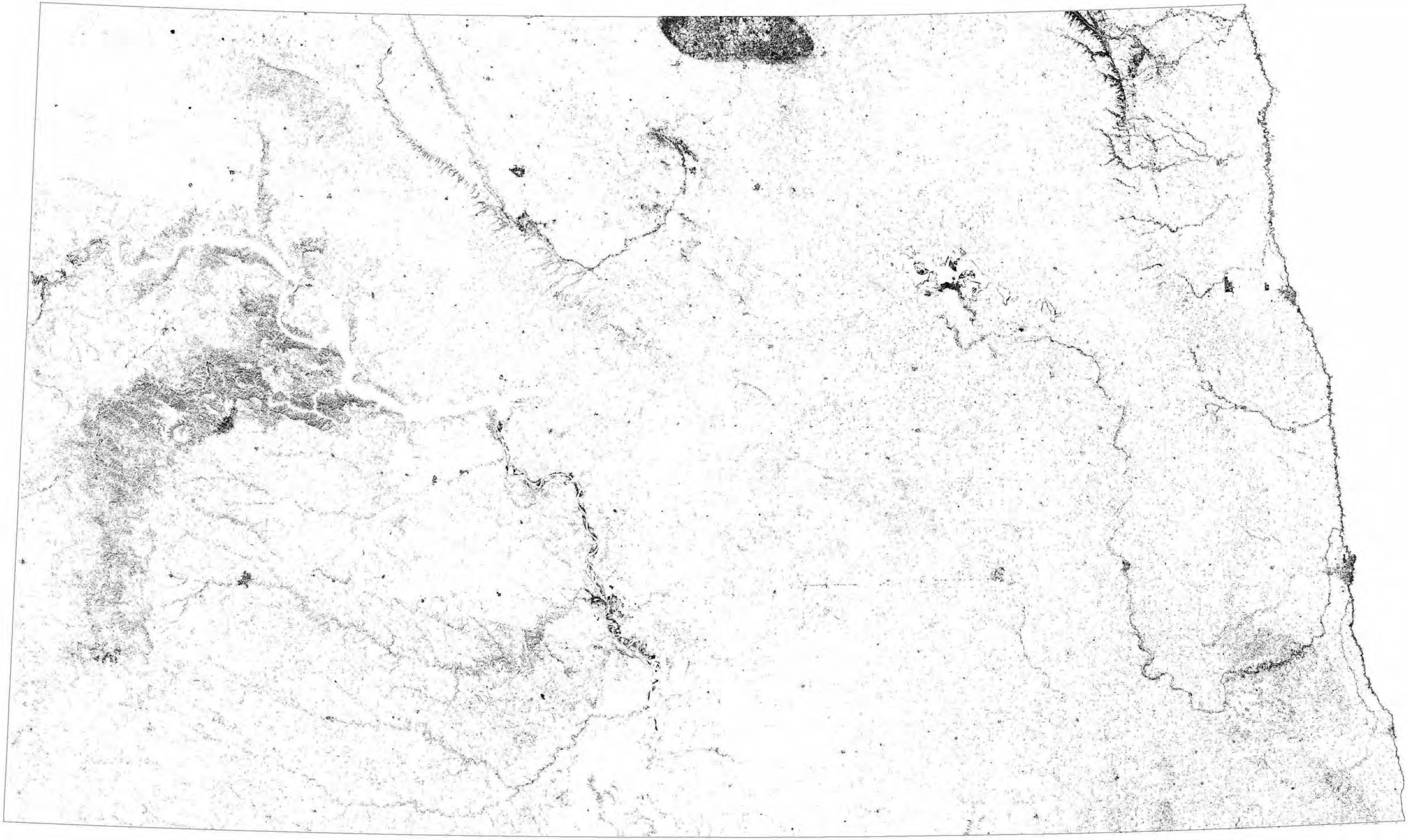
RED-HEADED WOODPECKER(Melanerpes erythrocephalus



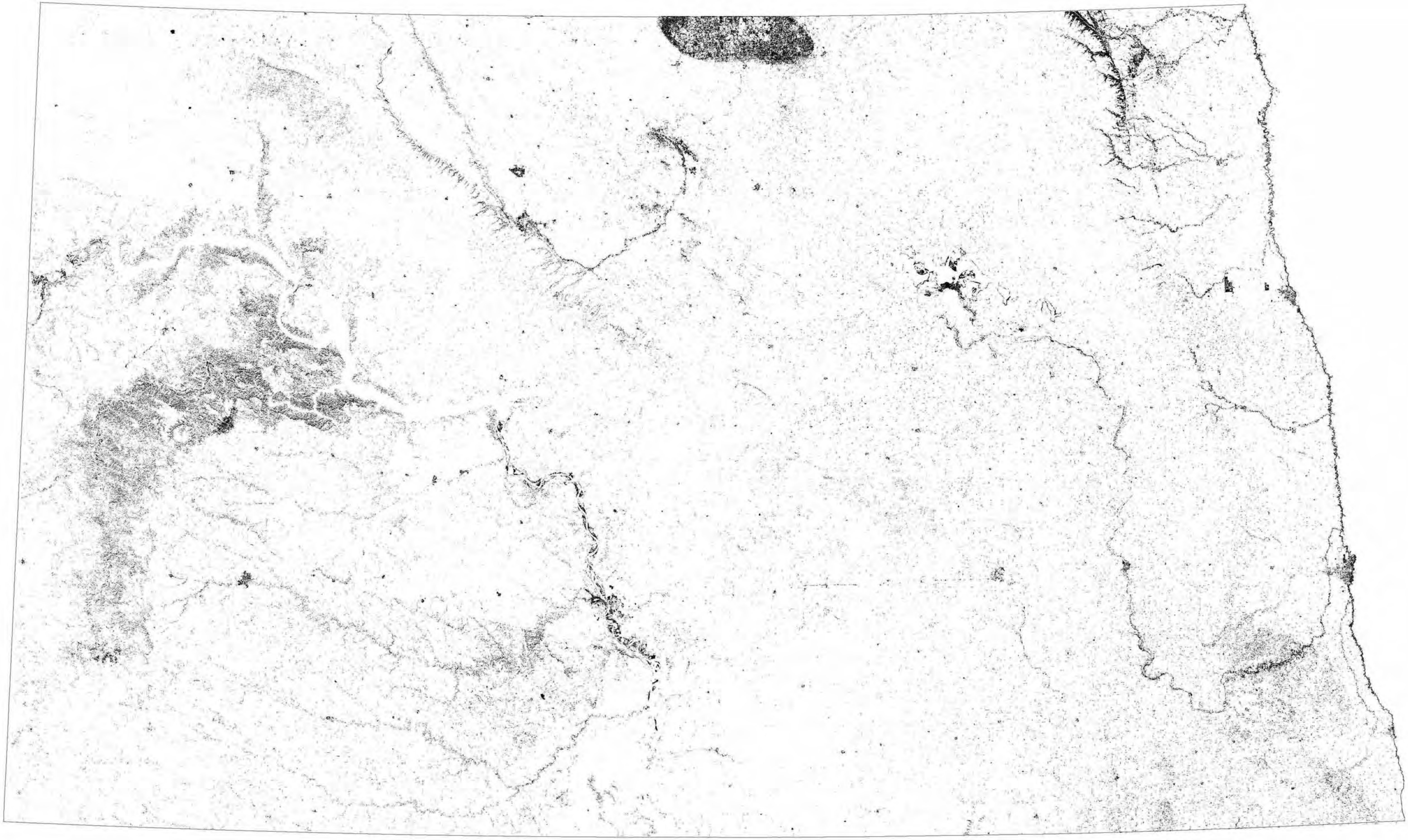
YELLOW-BELLIED SAPSUCKER(Sphyrapicus varius)



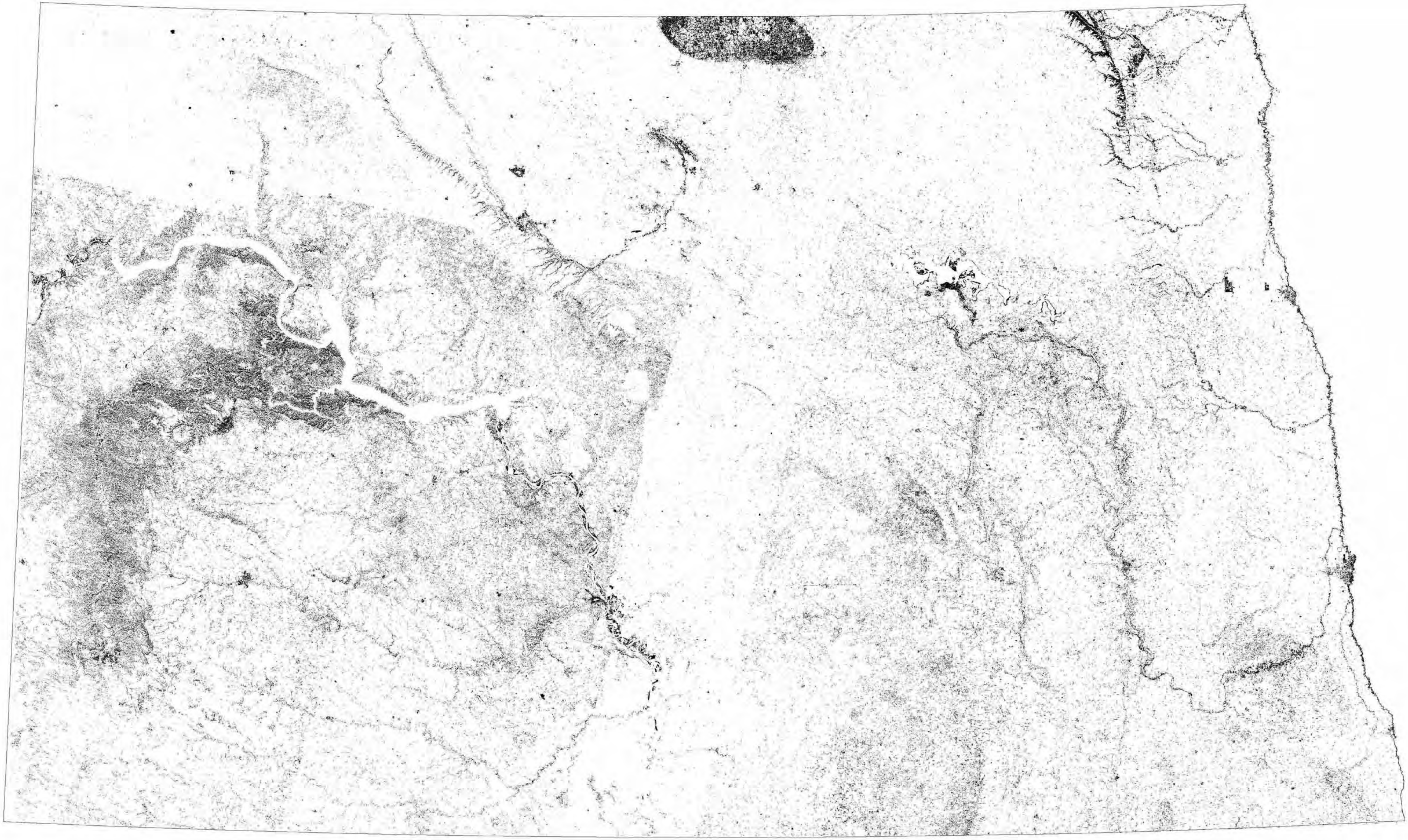
DOWNY WOODPECKER(Picoides pubescens)



HAIRY WOODPECKER(*Picoides villosus*)



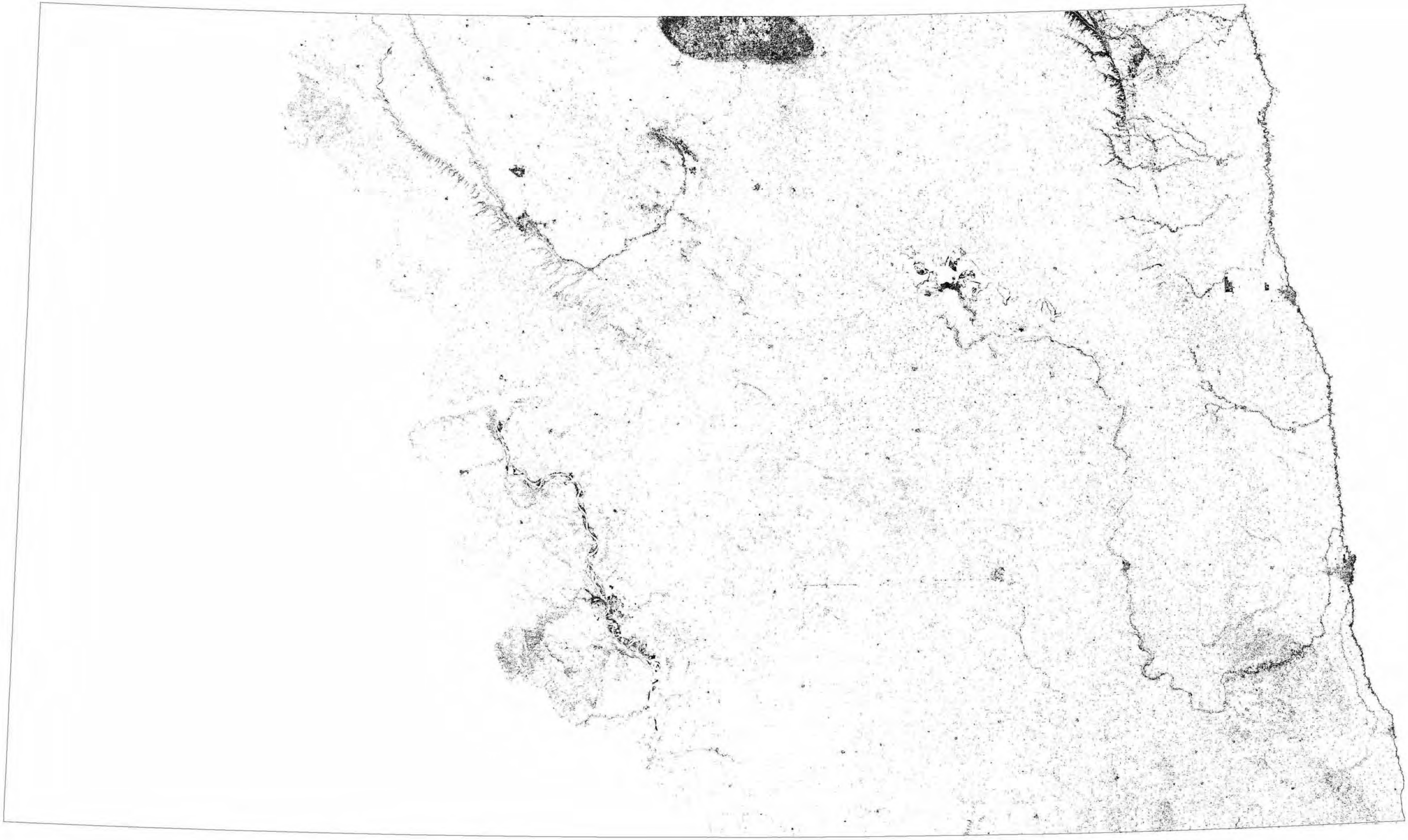
NORTHERN FLICKER(Colaptes auratus)



PILEATED WOODPECKER(Dryocopus pileatus)

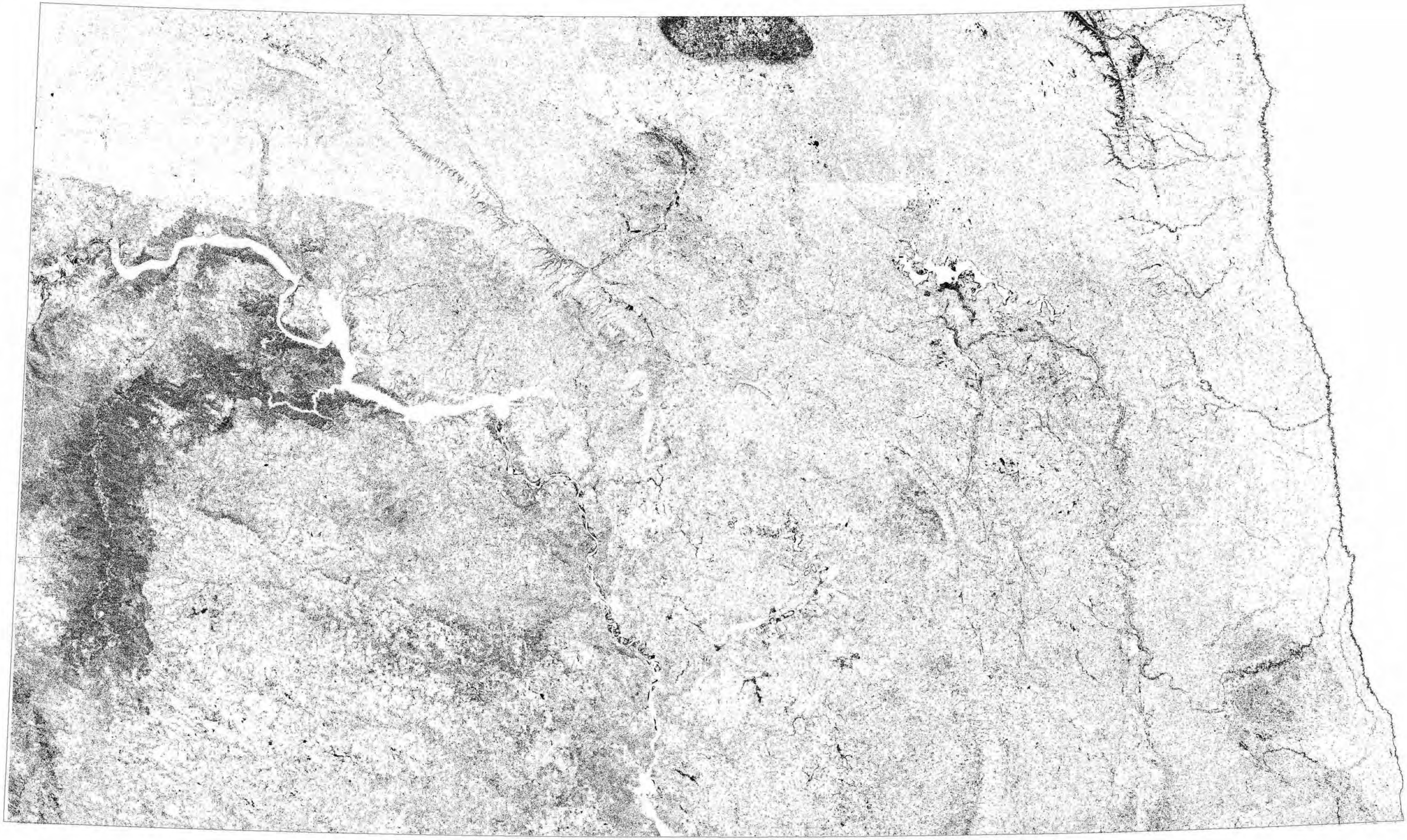
WESTERN WOOD-PEWEE(Contopus sordidulus)

EASTERN WOOD-PEWEE(Contopus virens)

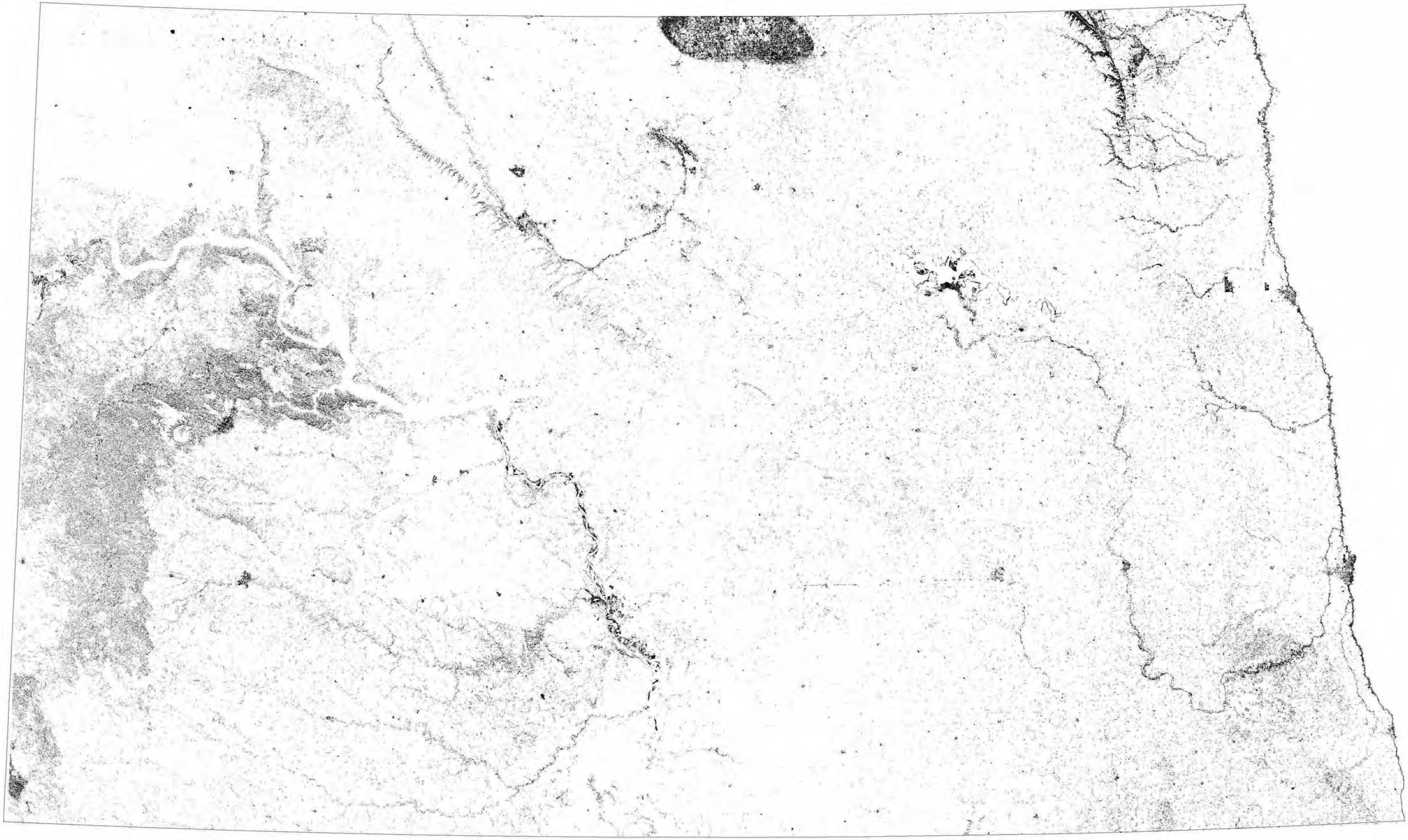


ALDER FLYCATCHER(Empidonax alnorum)

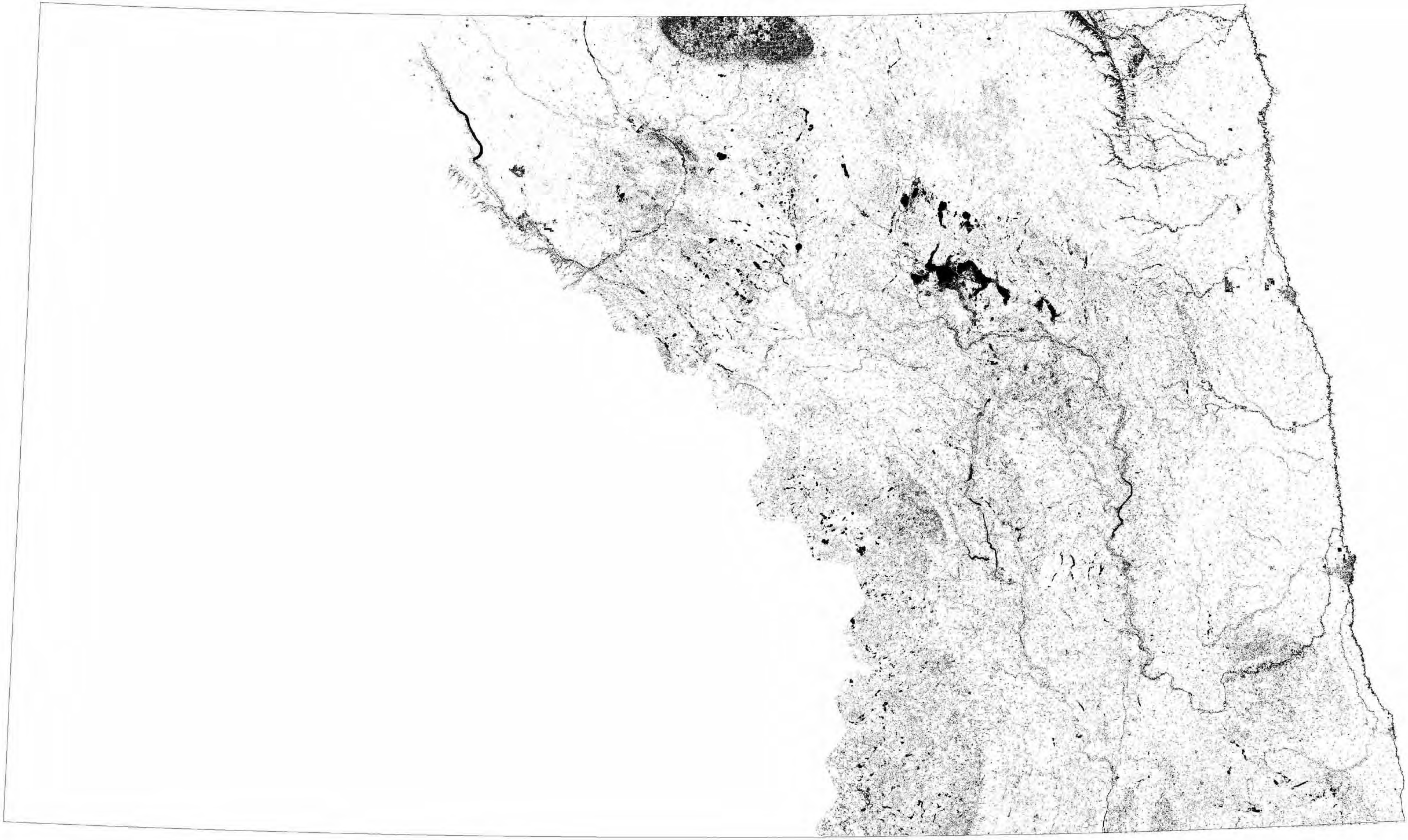
WILLOW FLYCATCHER(Empidonax traillii)



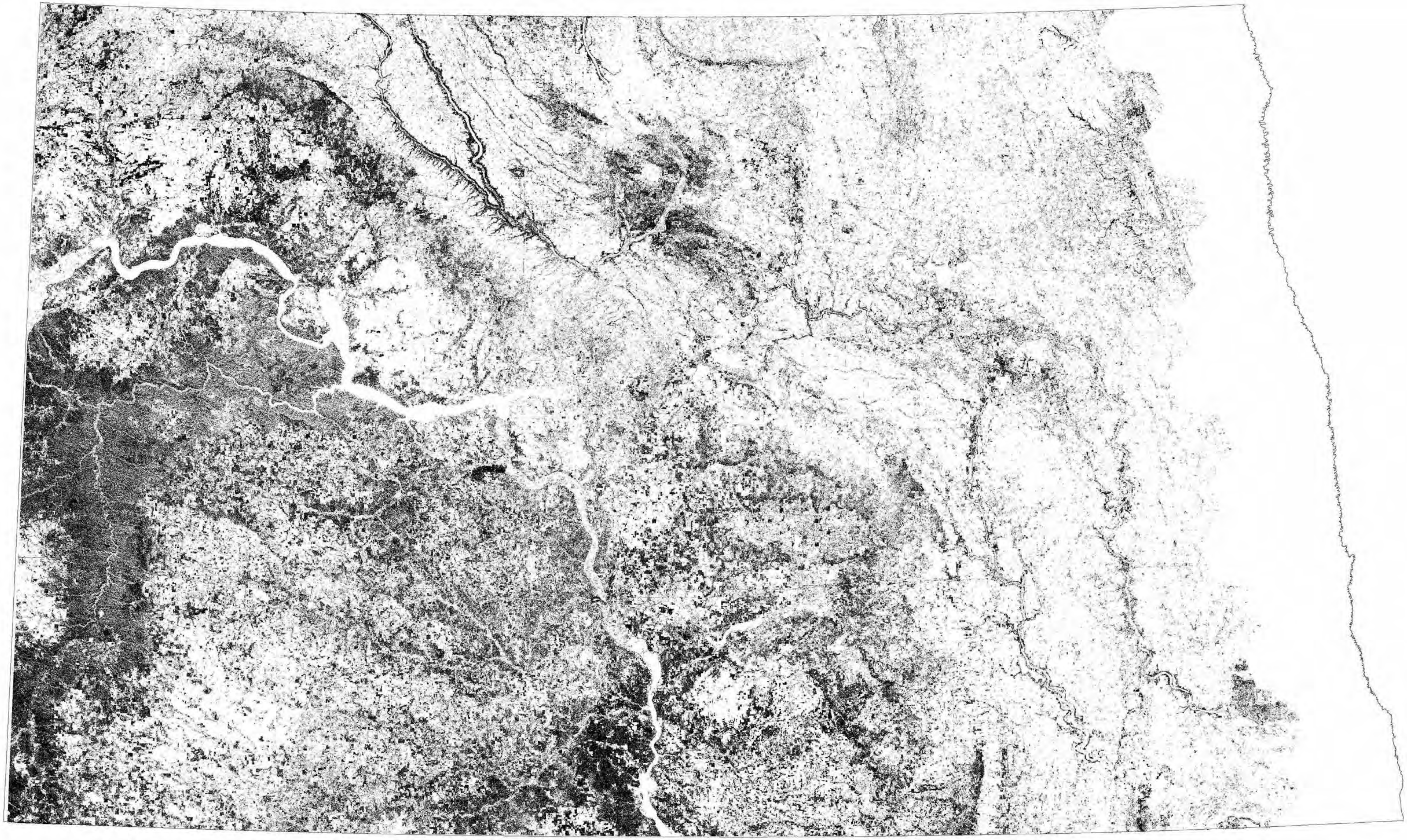
LEAST FLYCATCHER(Empidonax minimus)



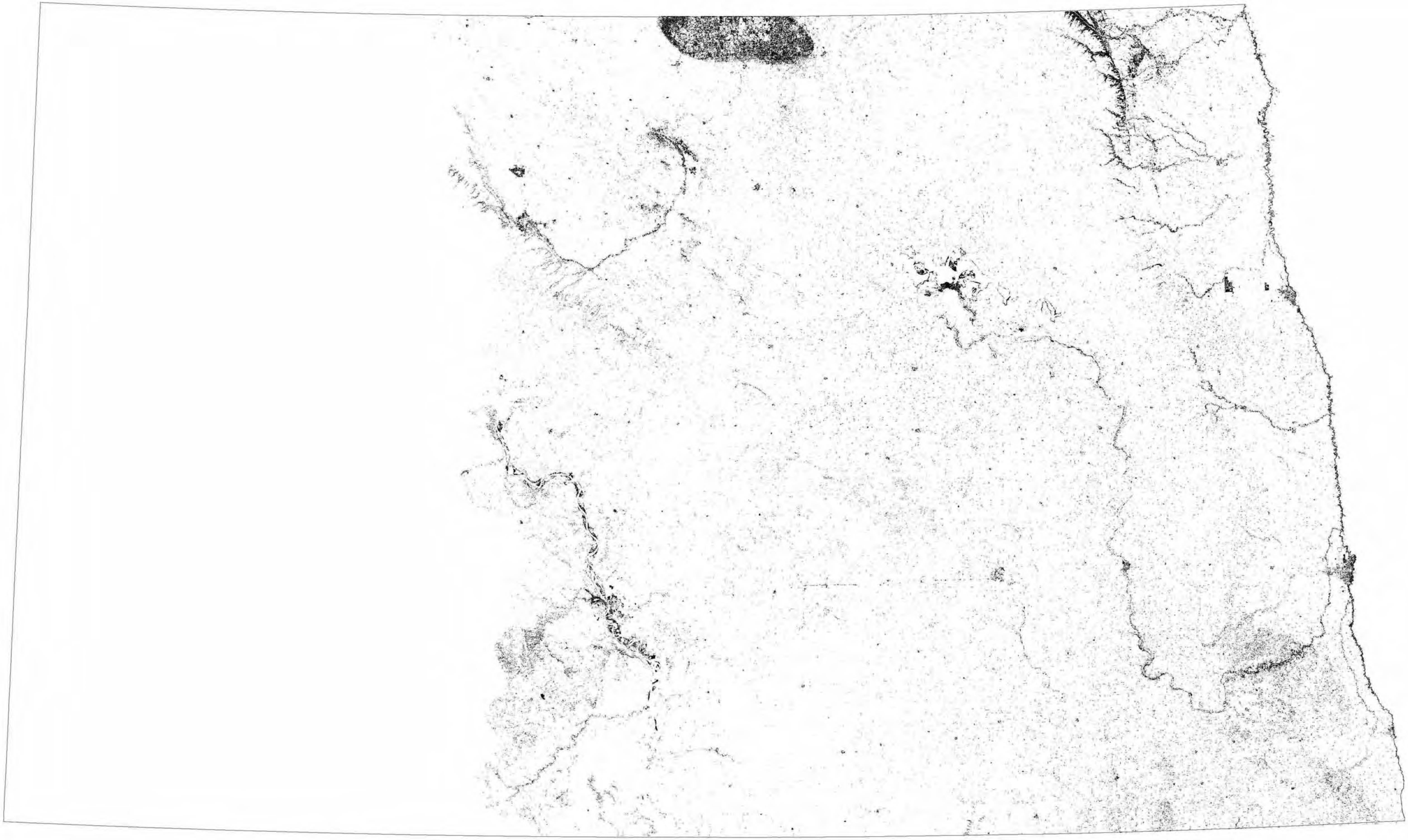
EASTERN PHOEBE(Sayornis phoebe)



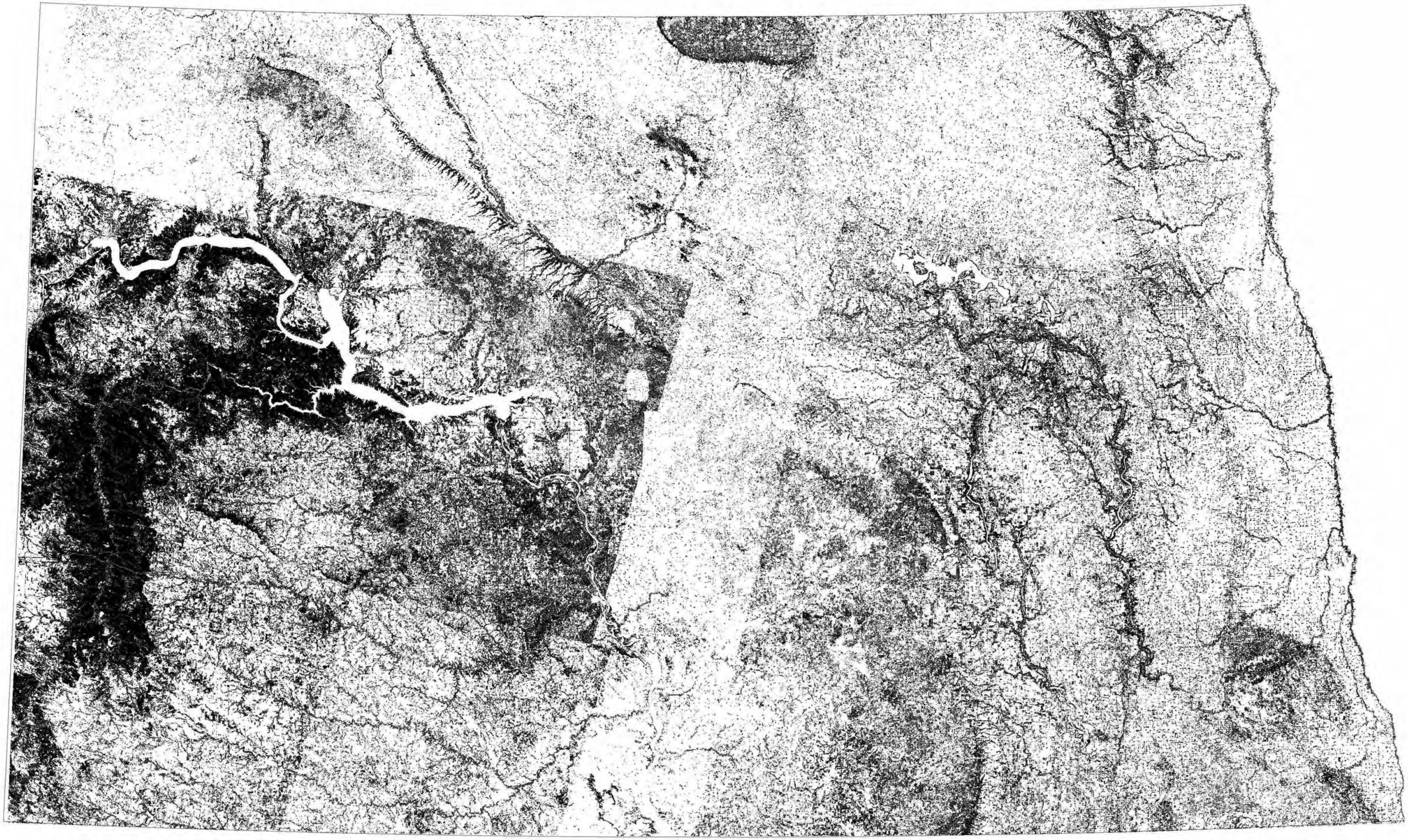
SAY'S PHOEBE(Sayornis saya)



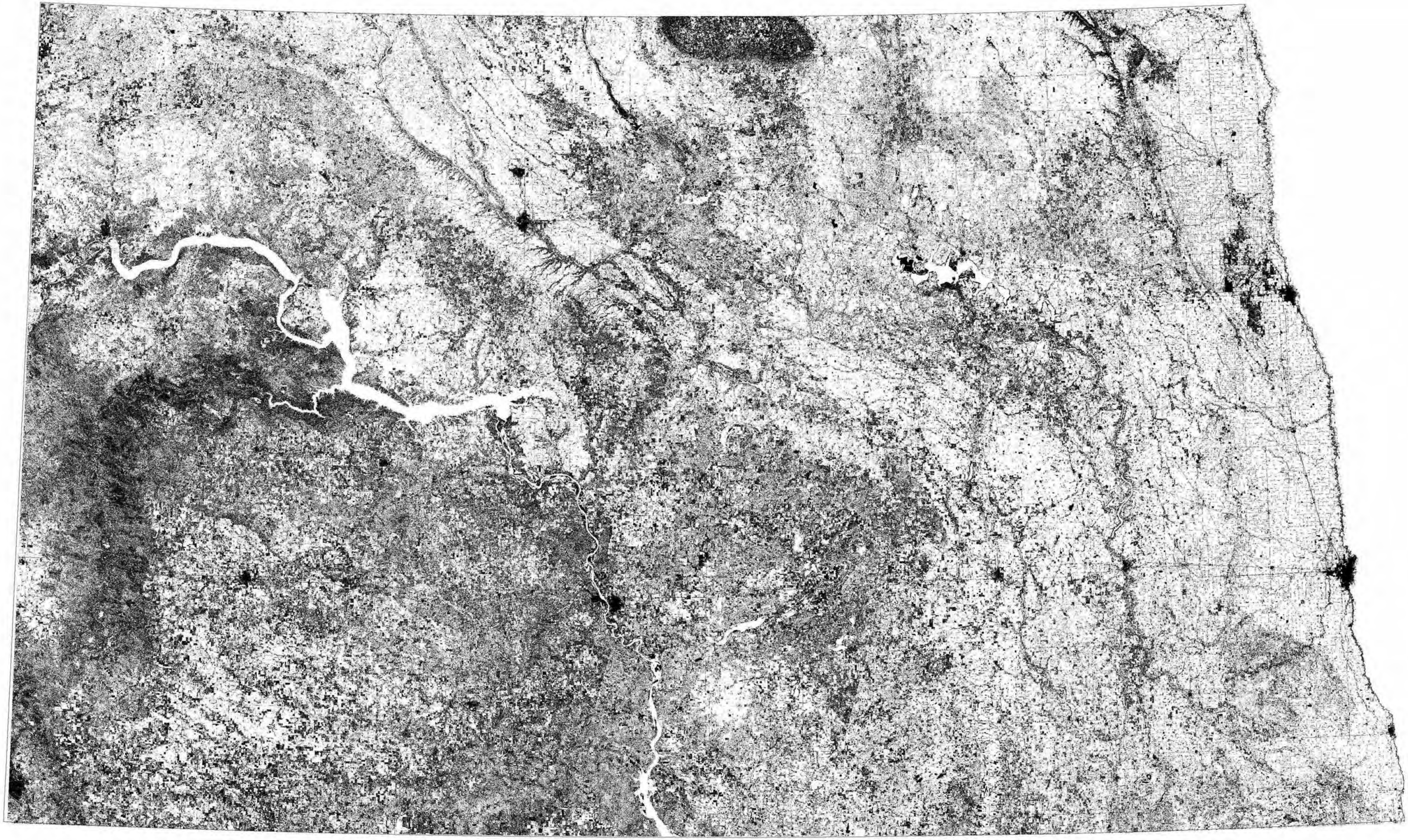
GREAT CRESTED FLYCATCHER(Myiarchus crinitus)



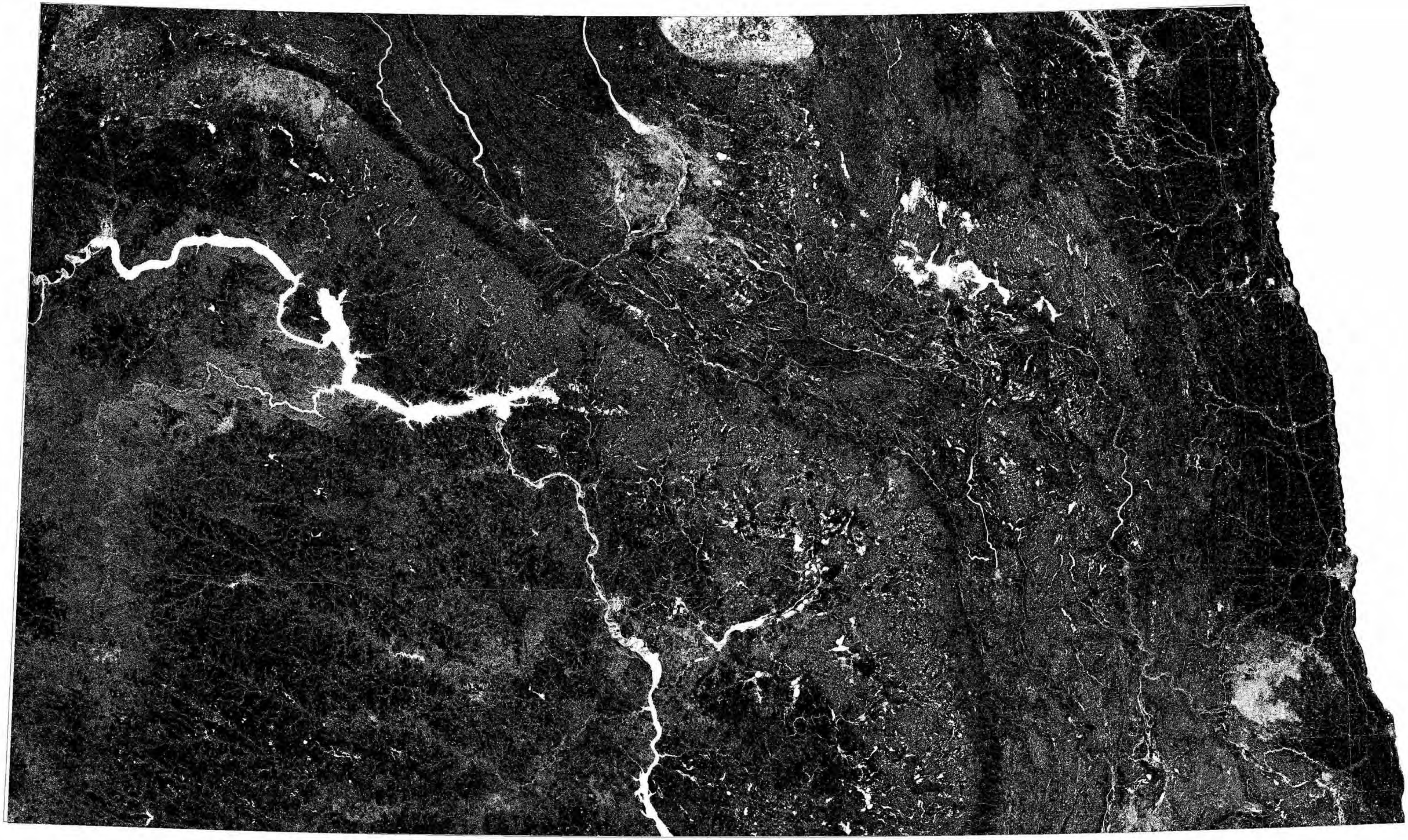
WESTERN KINGBIRD(Tyrannus verticalis)



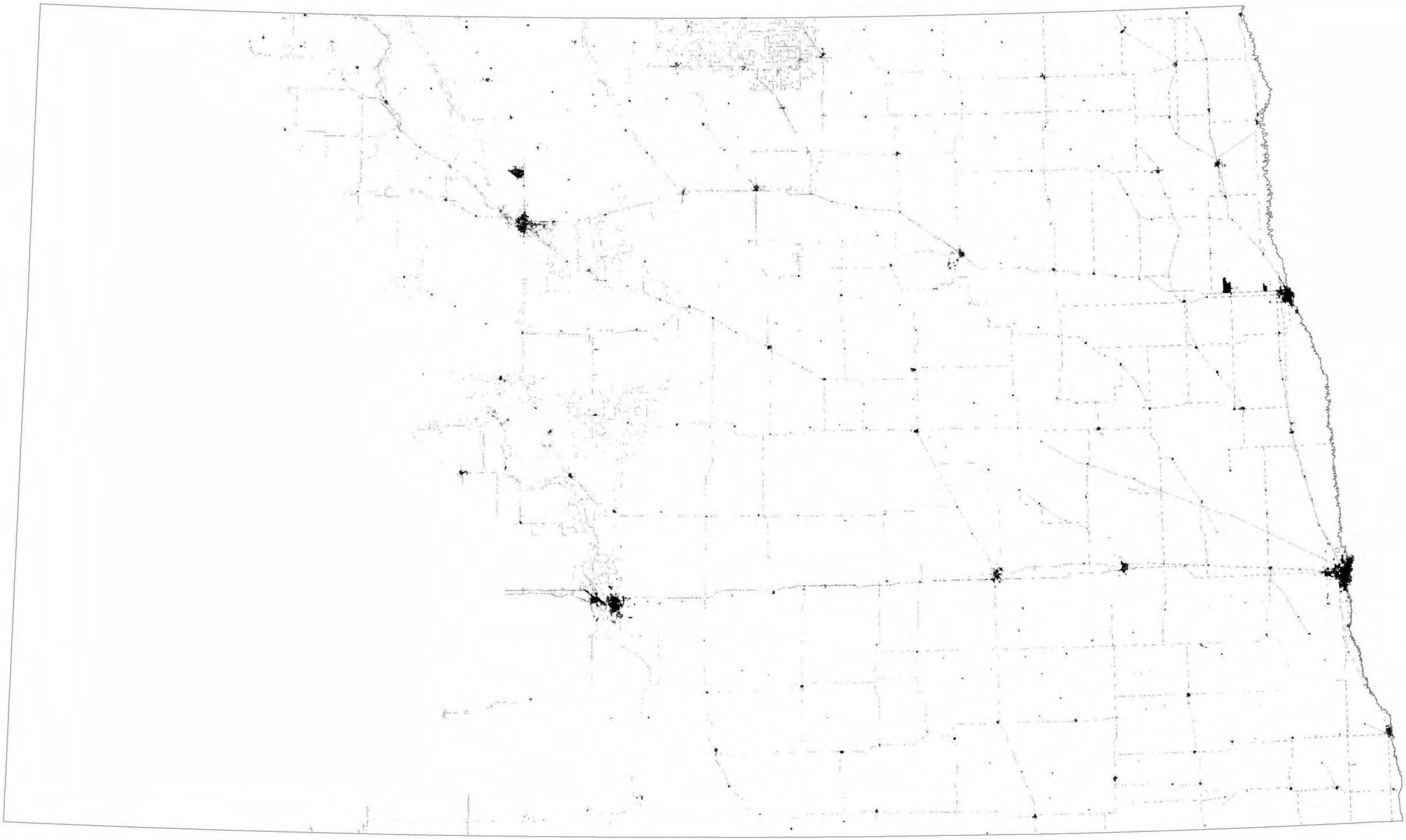
EASTERN KINGBIRD(Tyrannus tyrannus)



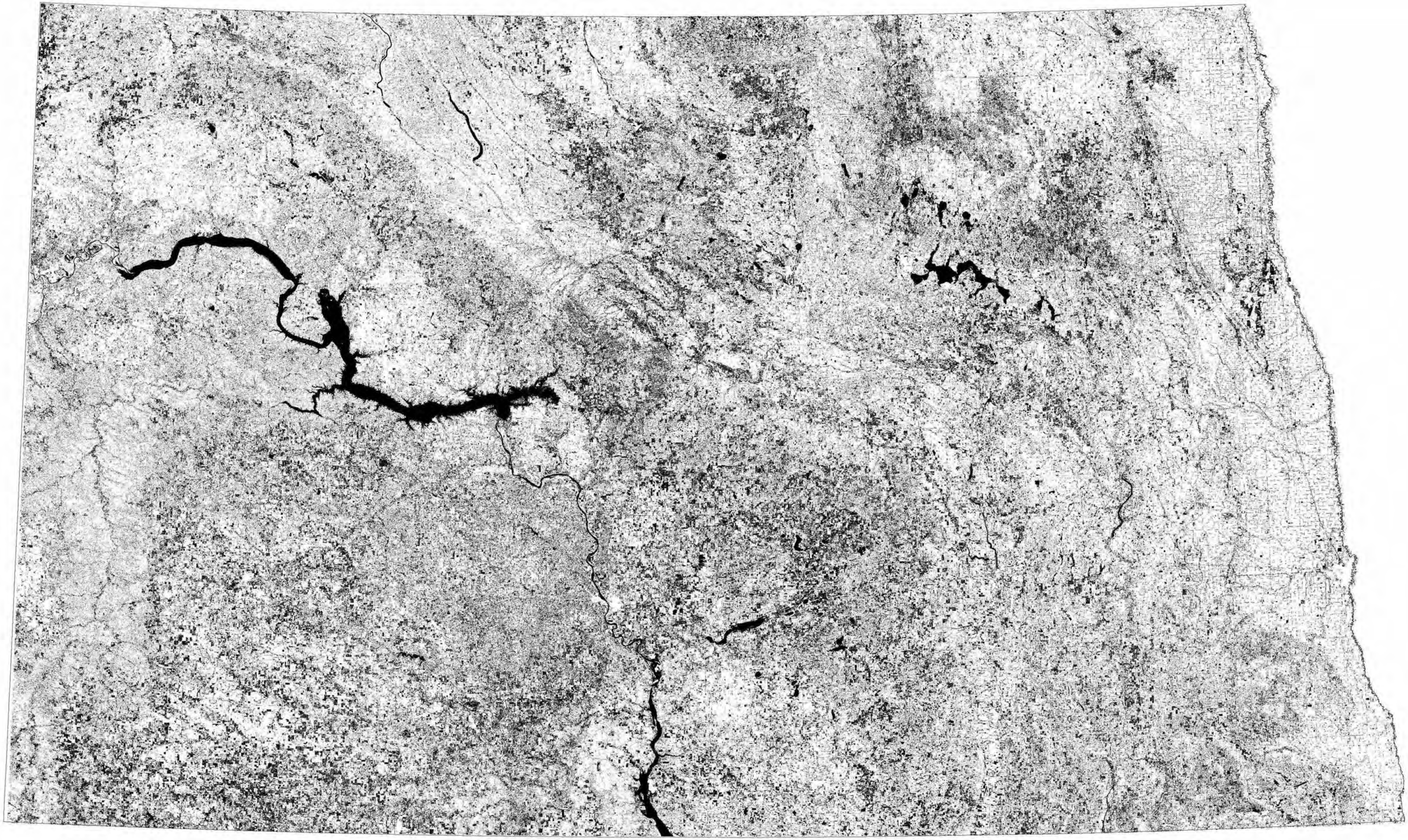
HORNED LARK(Eremophila alpestris)



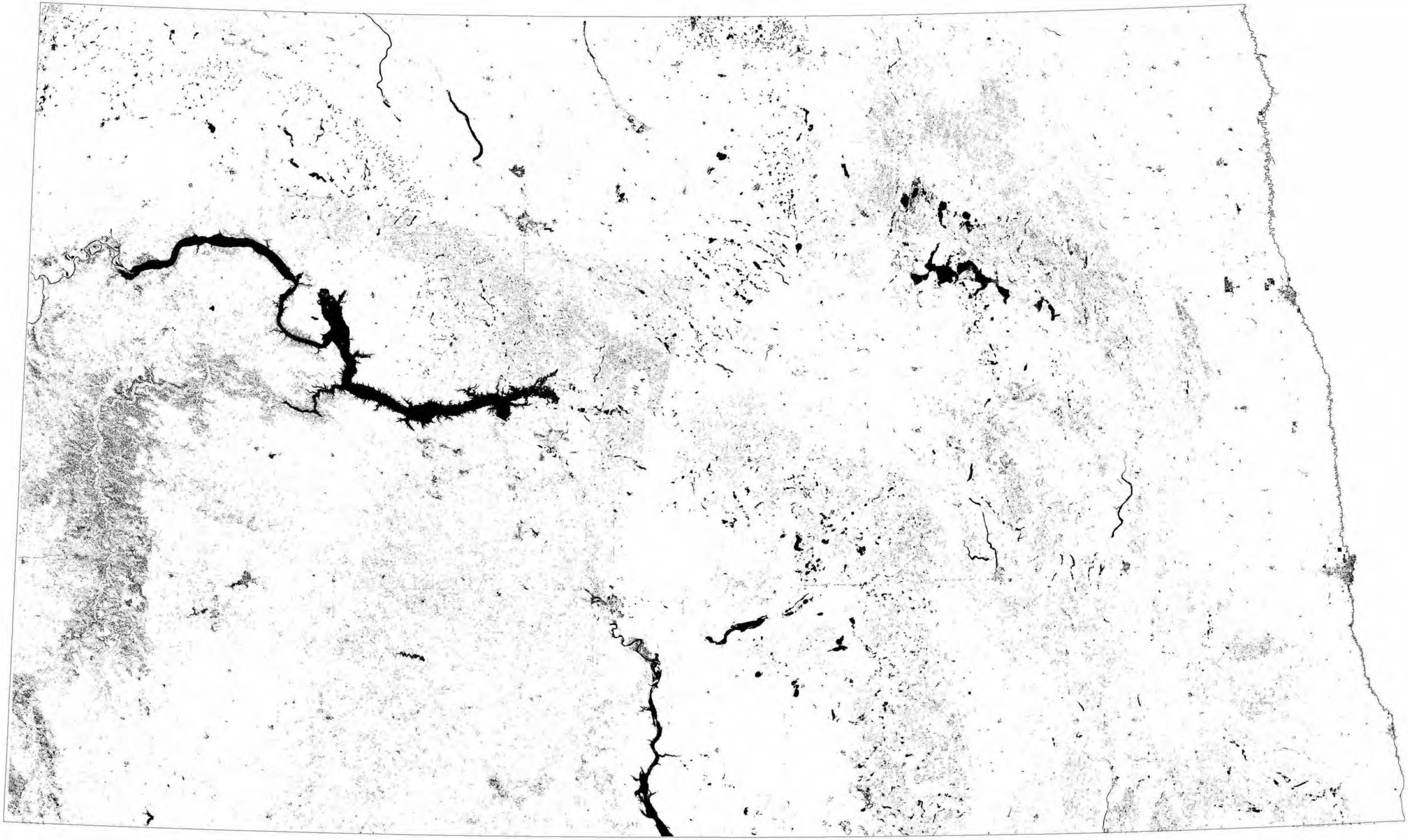
PURPLE MARTIN(Progne subis)



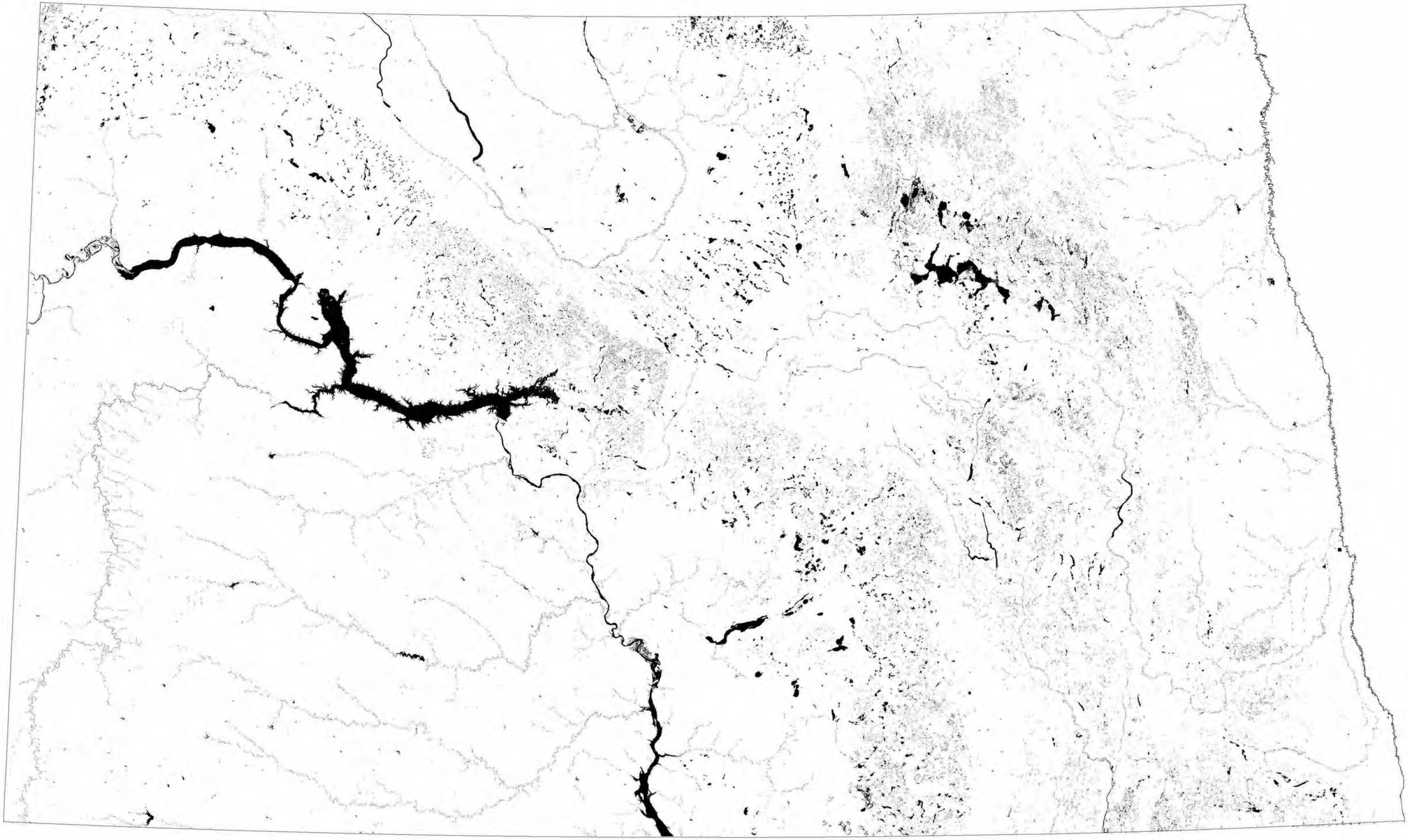
TREE SWALLOW(Tachycineta bicolor)



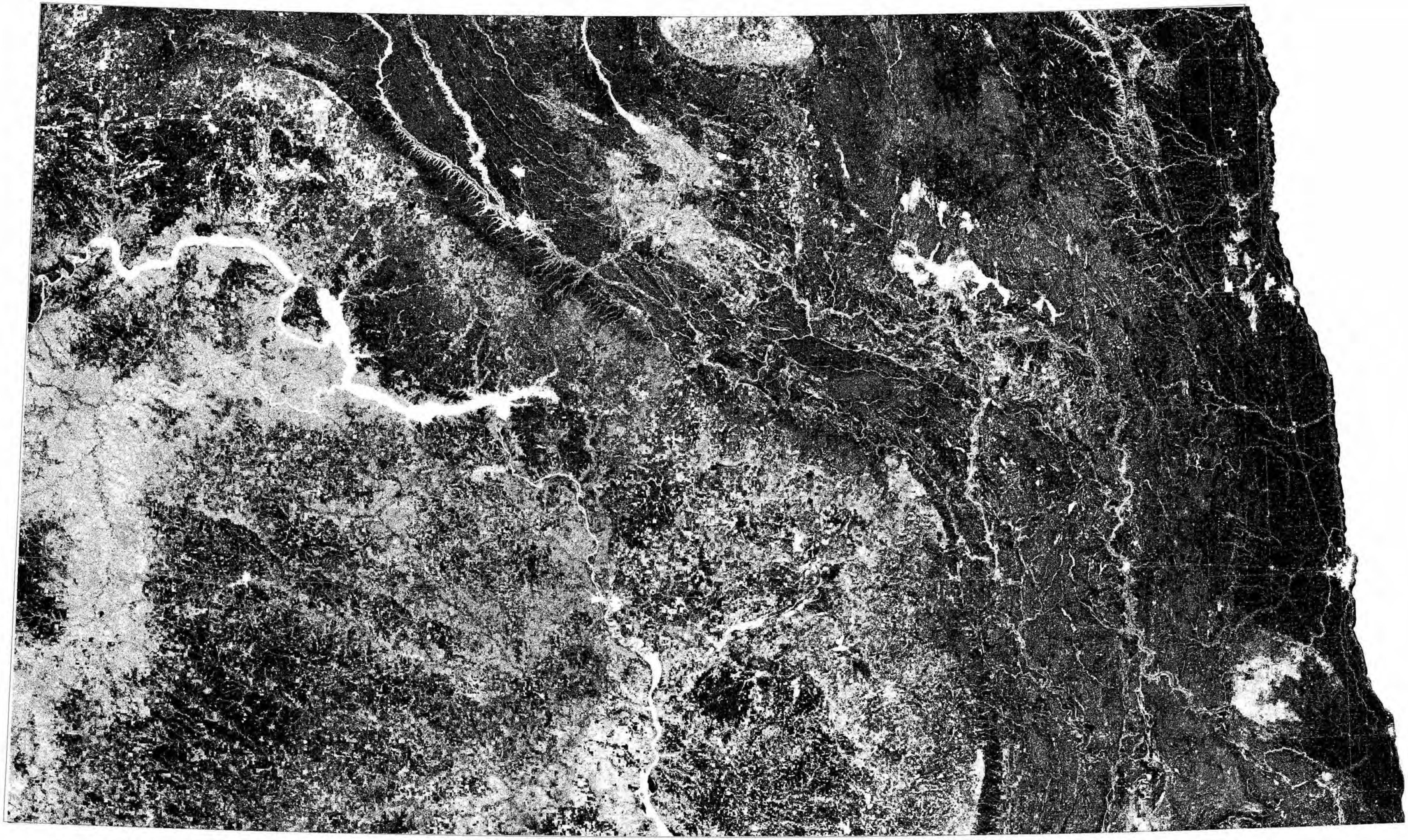
NORTHERN ROUGH-WINGED SWALLOW(Stelgidopteryx s



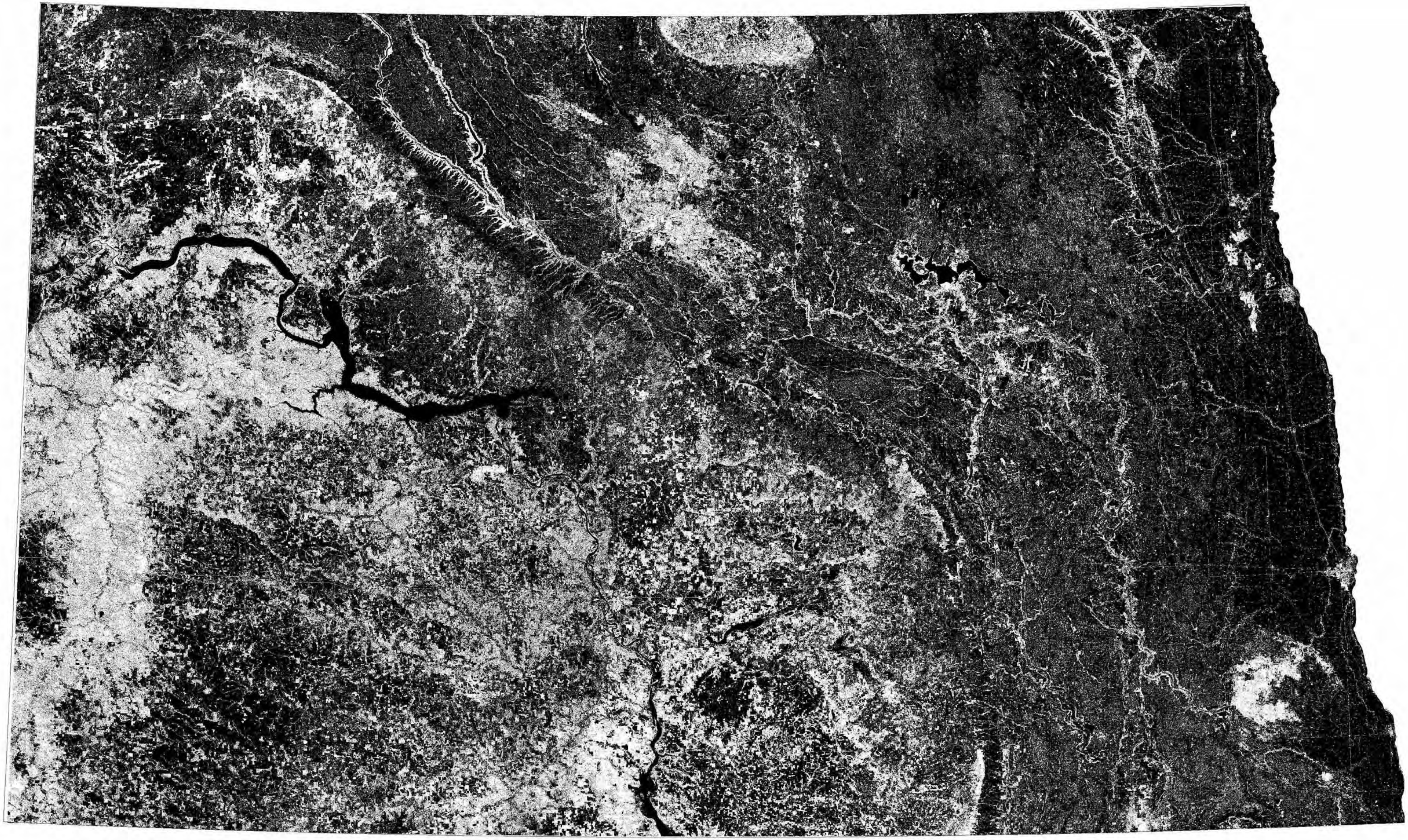
BANK SWALLOW(Riparia riparia)



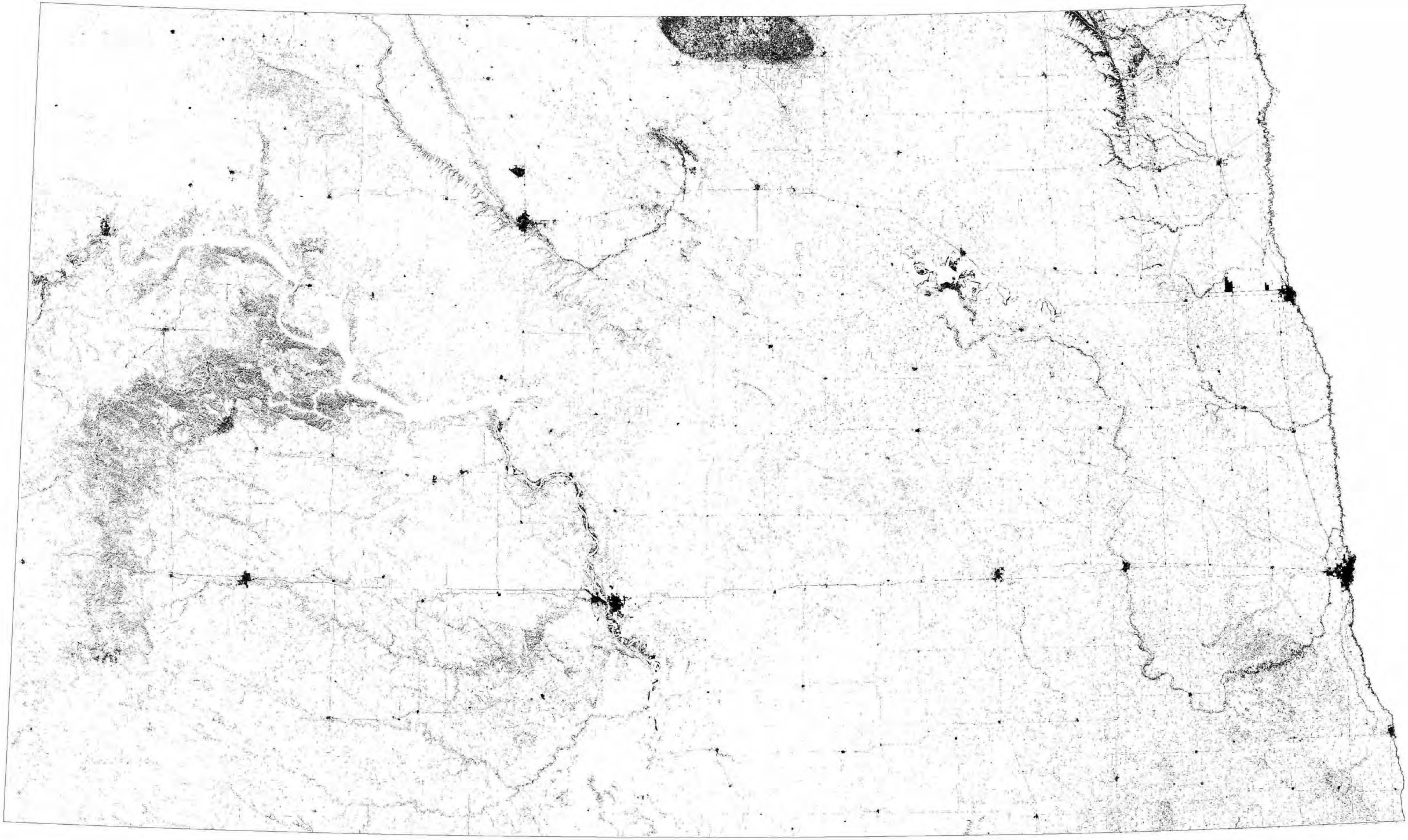
CLIFF SWALLOW(Petrochelidon pyrrhonota)



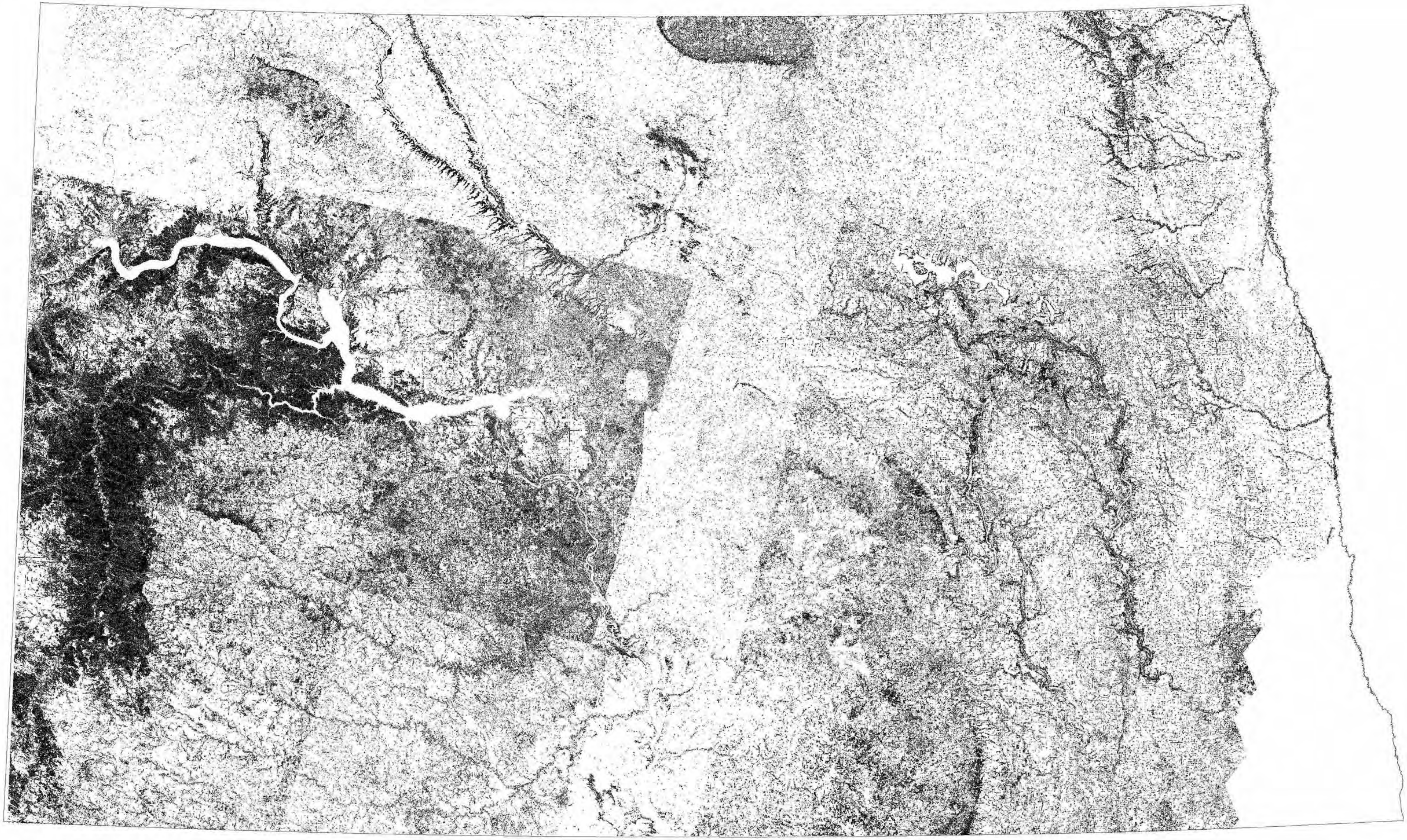
BARN SWALLOW(Hirundo rustica)



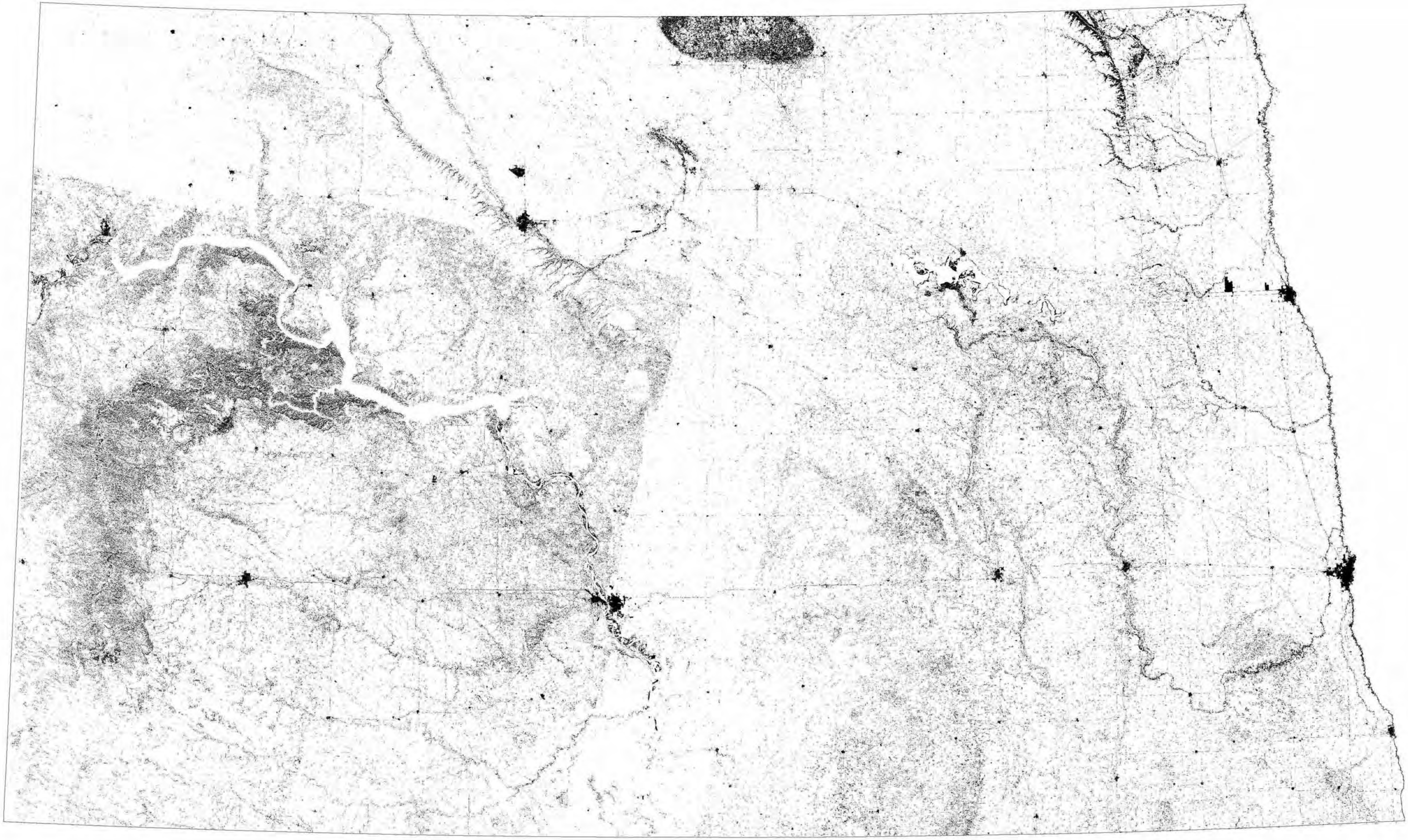
BLUE JAY(Cyanocitta cristata)



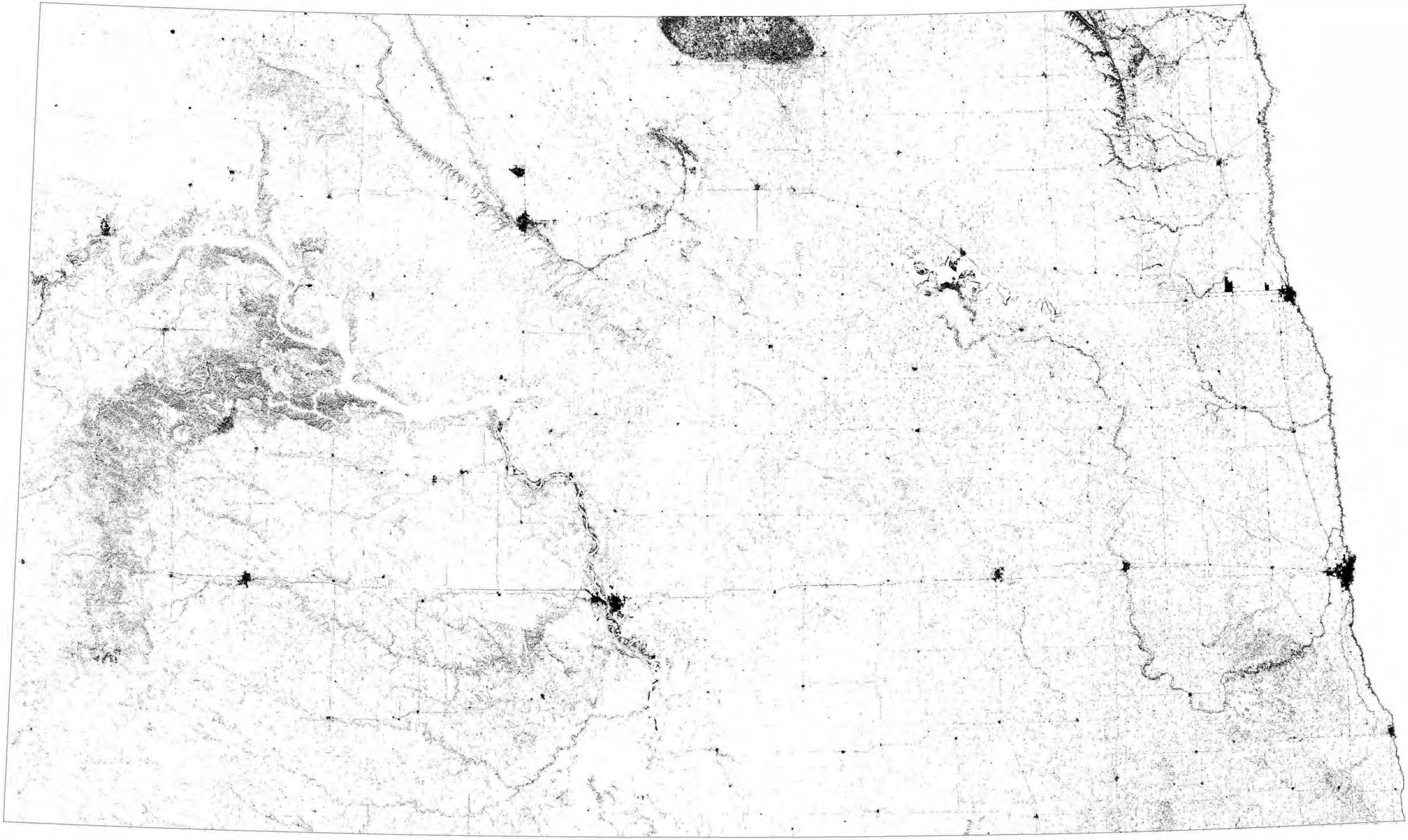
BLACK-BILLED MAGPIE(Pica pica)



AMERICAN CROW(Corvus brachyrhynchos)

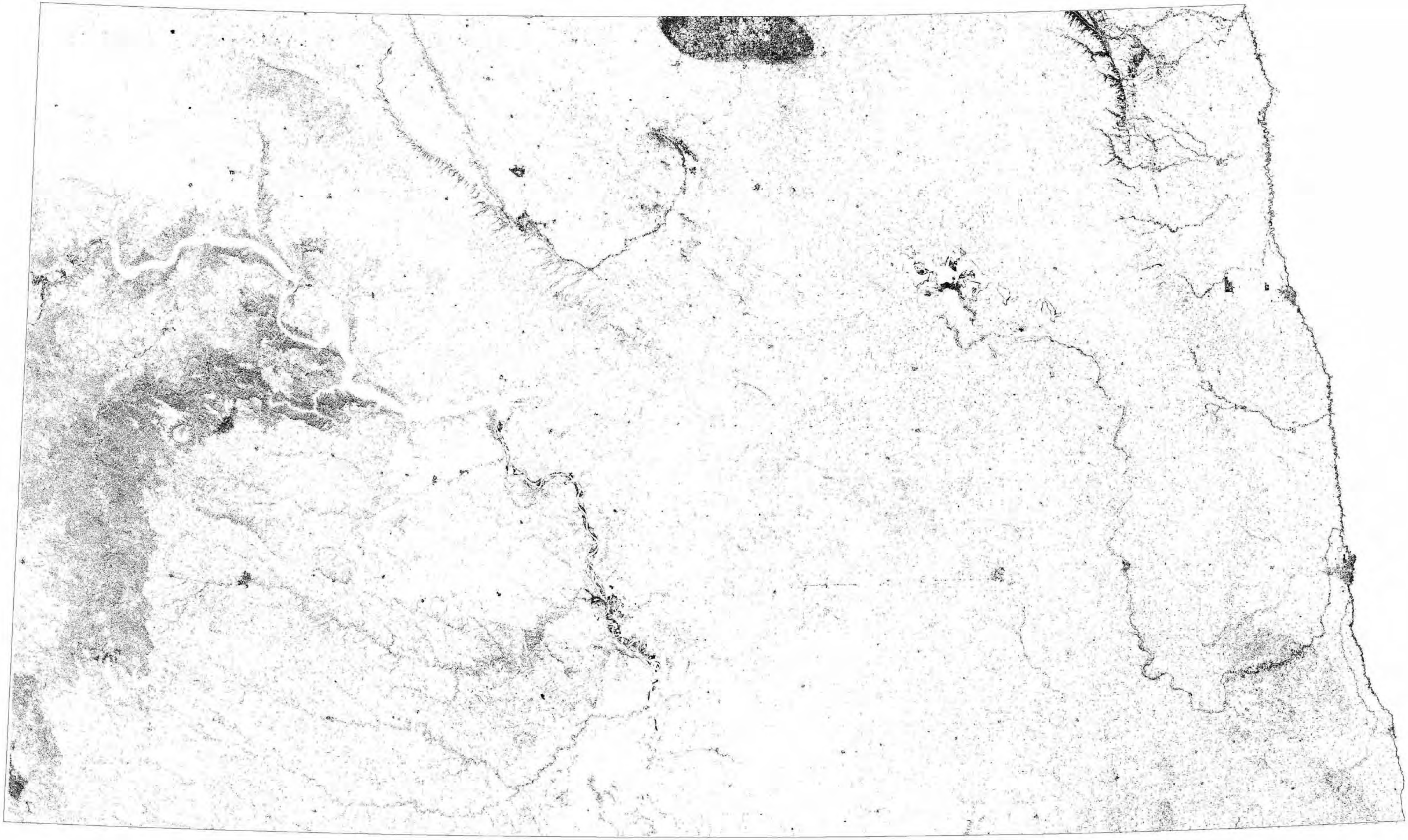


BLACK-CAPPED CHICKADEE(Poecile atricapillus)

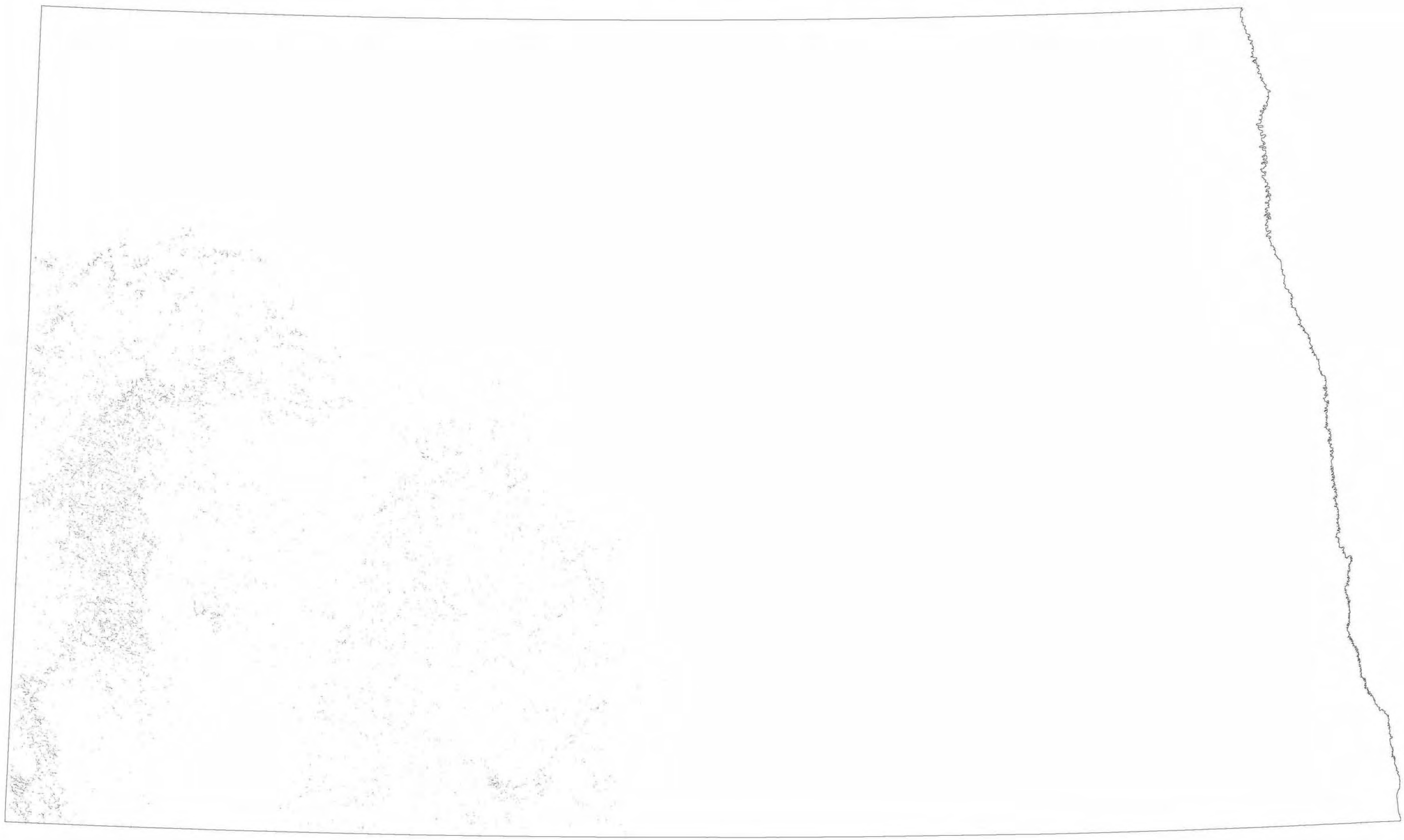


RED-BREASTED NUTHATCH(Sitta canadensis)

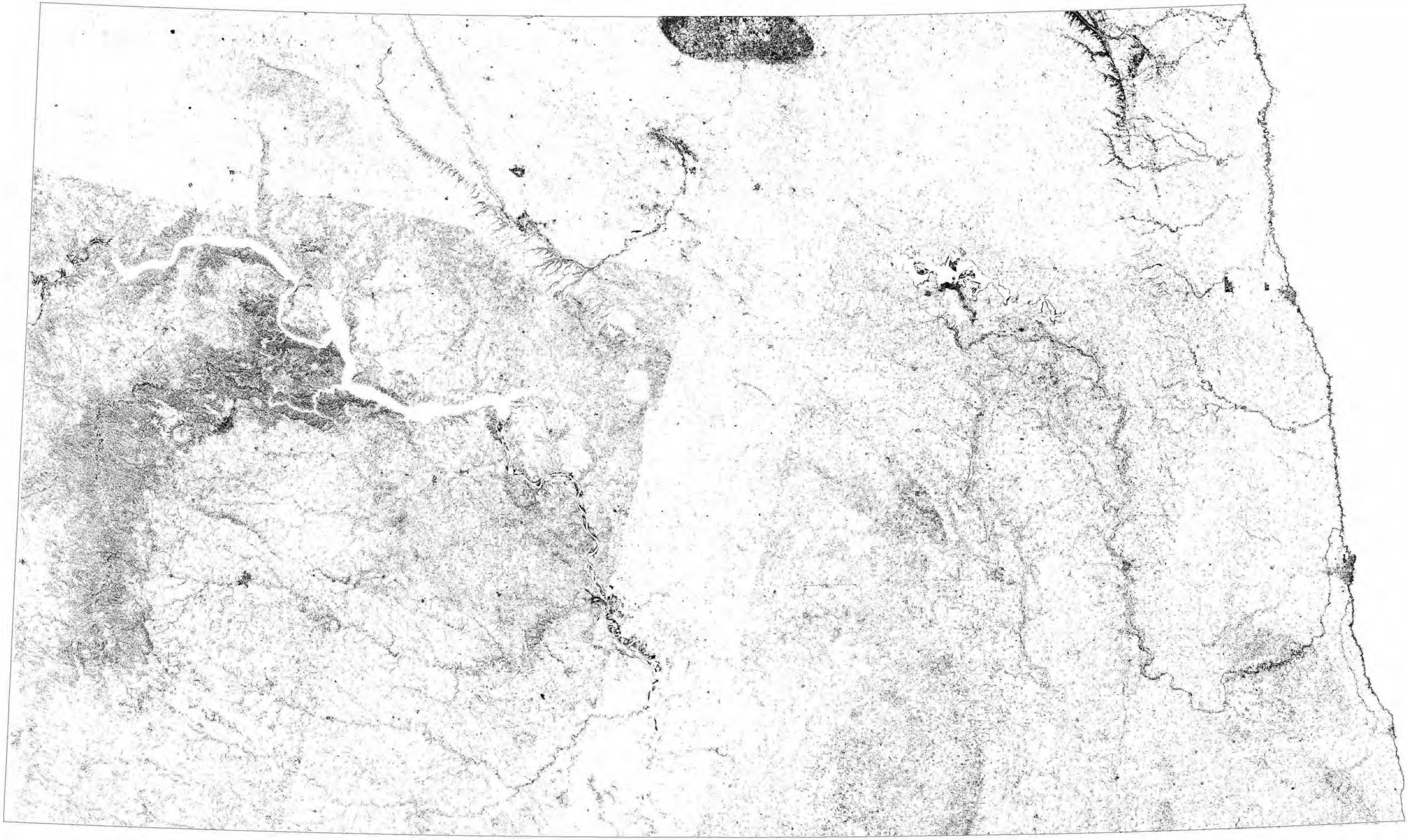
WHITE-BREASTED NUTHATCH(Sitta carolinensis)



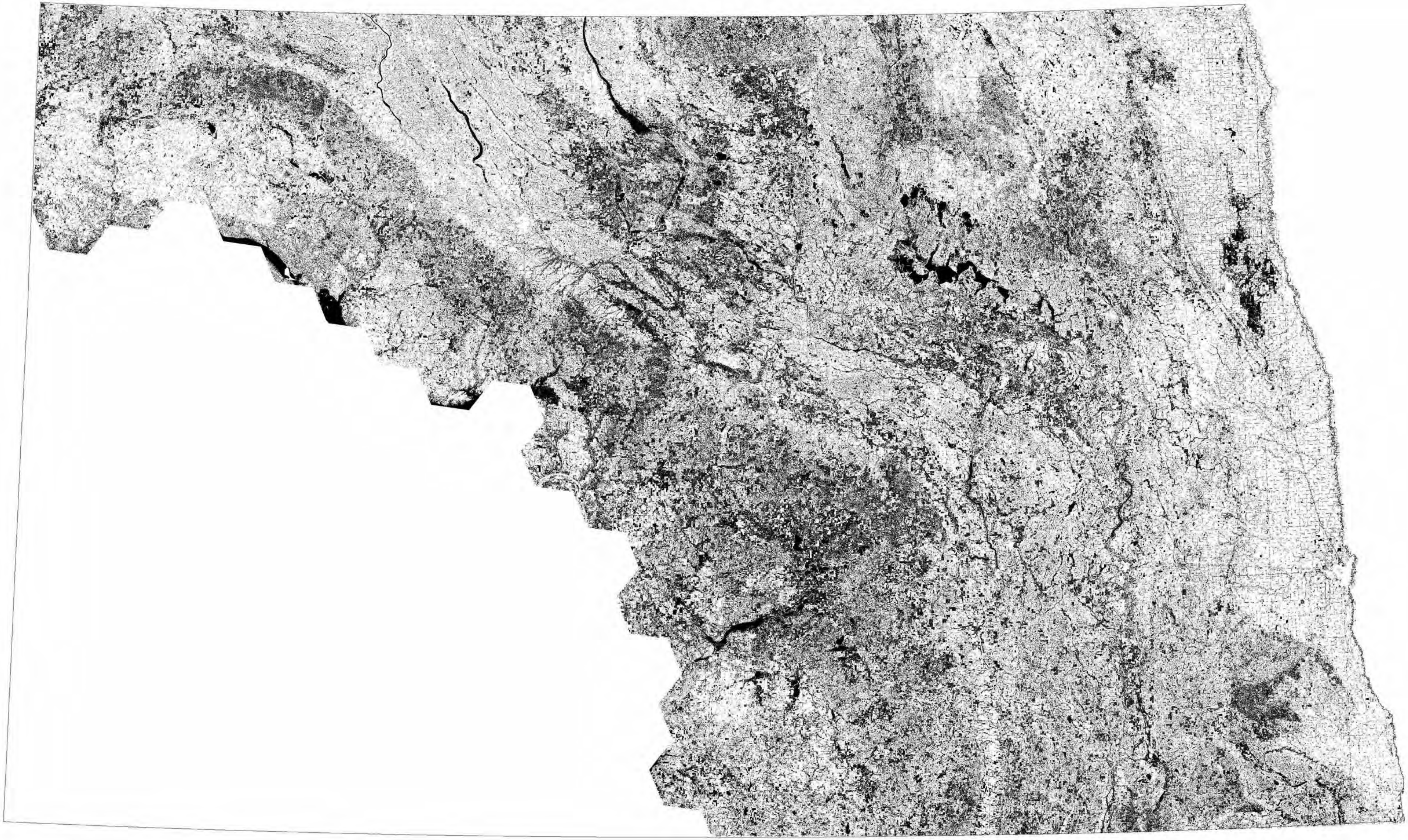
ROCK WREN(Salpinctes obsoletus)



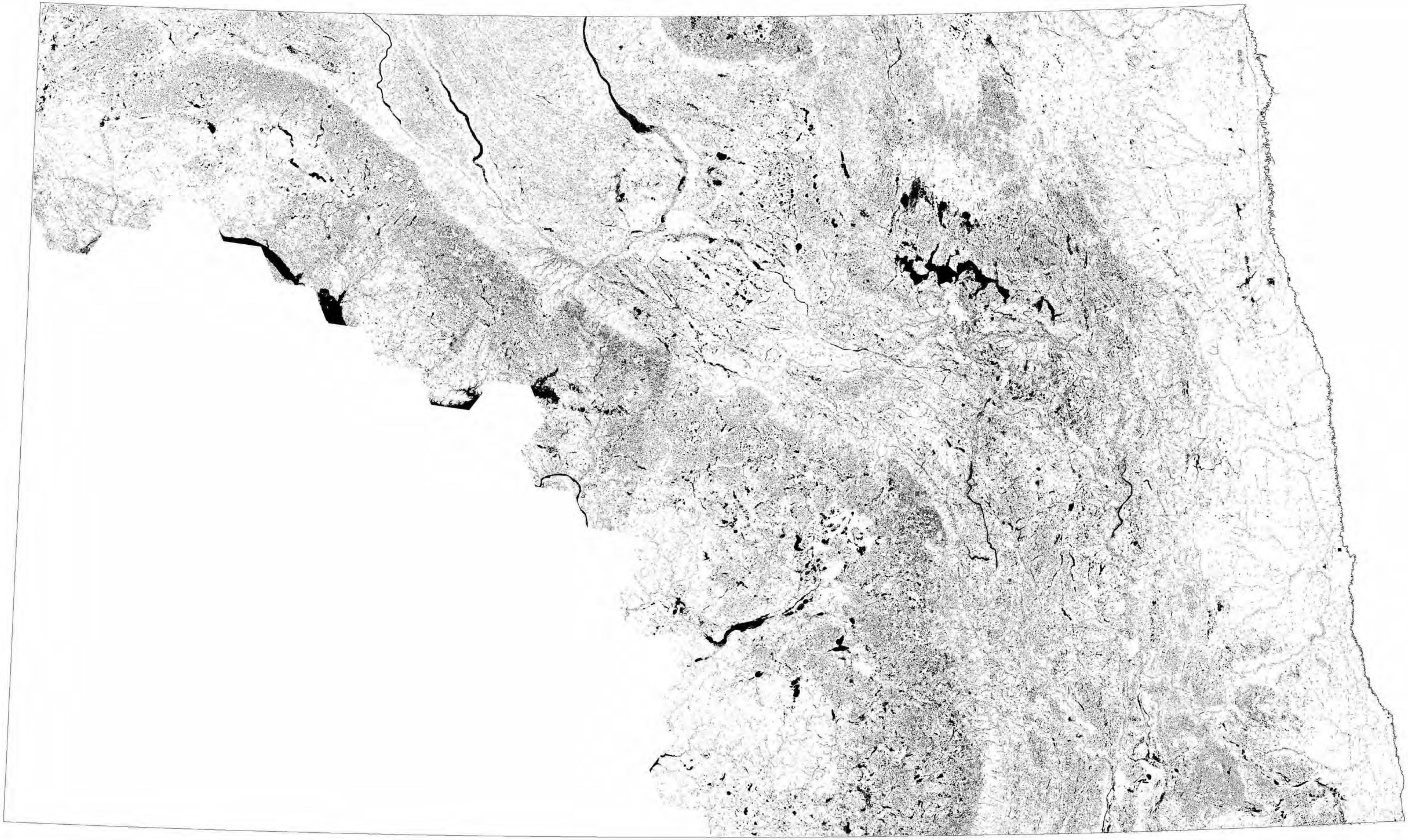
HOUSE WREN(Troglodytes aedon)



SEDGE WREN(Cistothorus platensis)

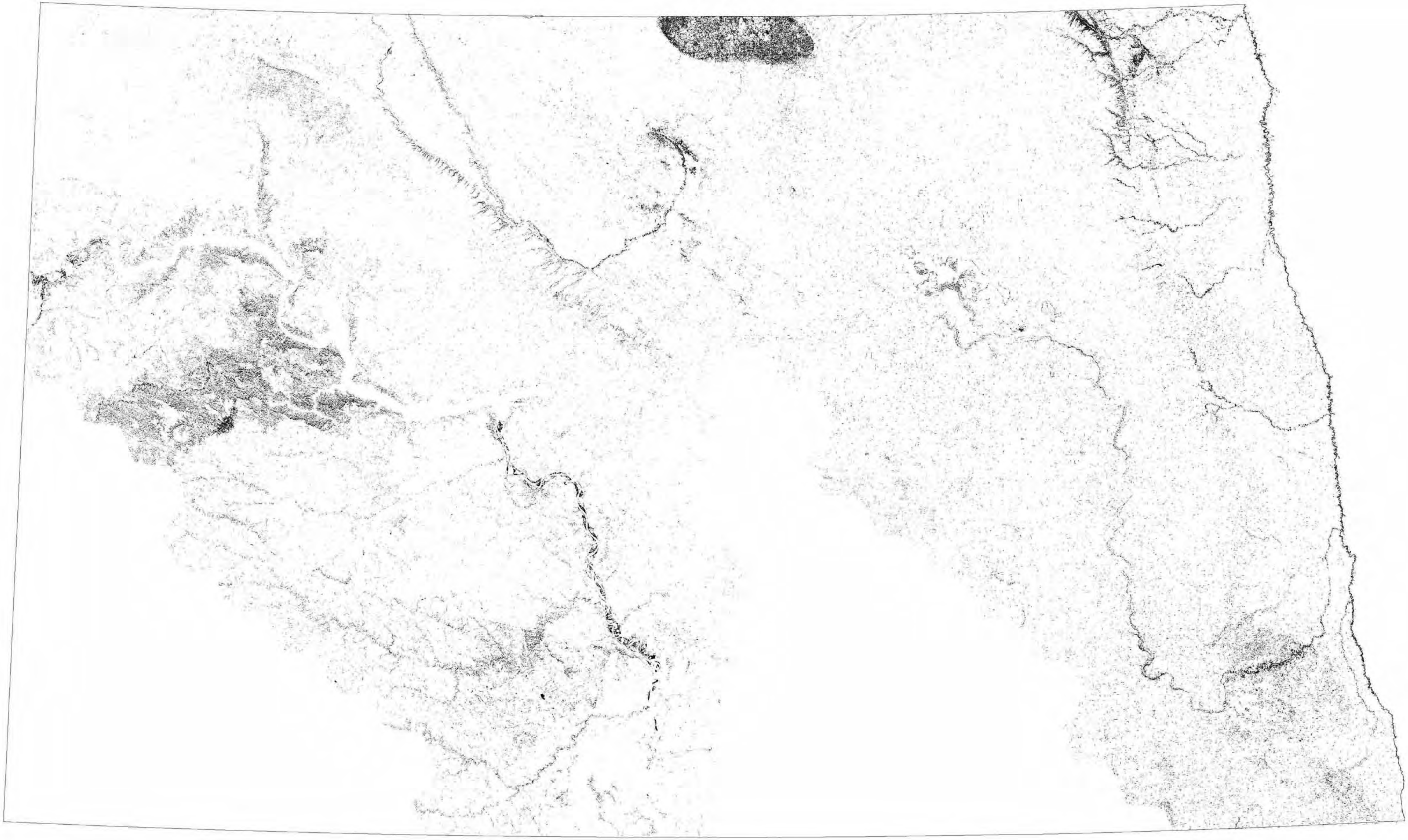


MARSH WREN(Cistothorus palustris)

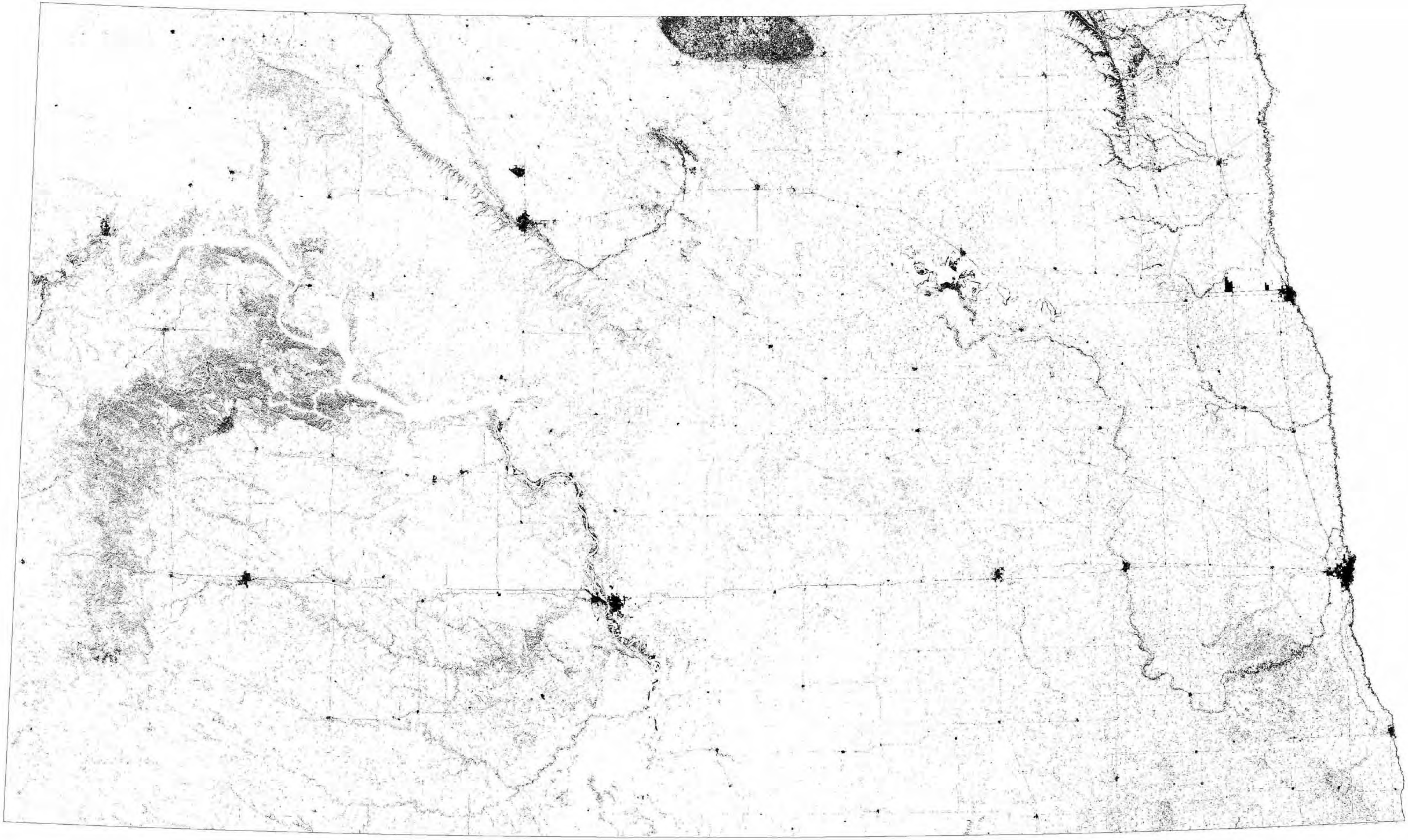


MOUNTAIN BLUEBIRD(Sialia currucoides)

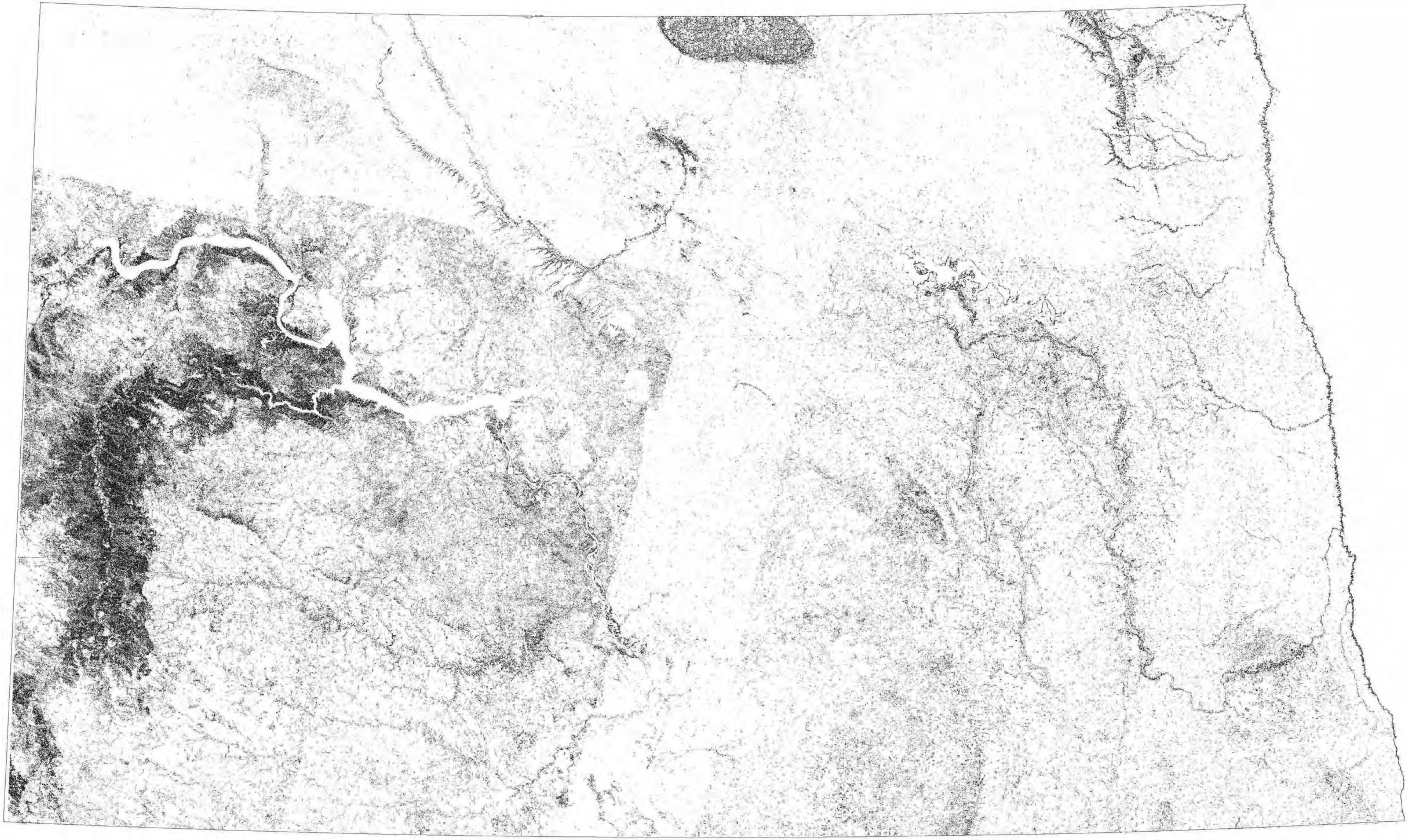
VEERY(Catharus fuscescens)



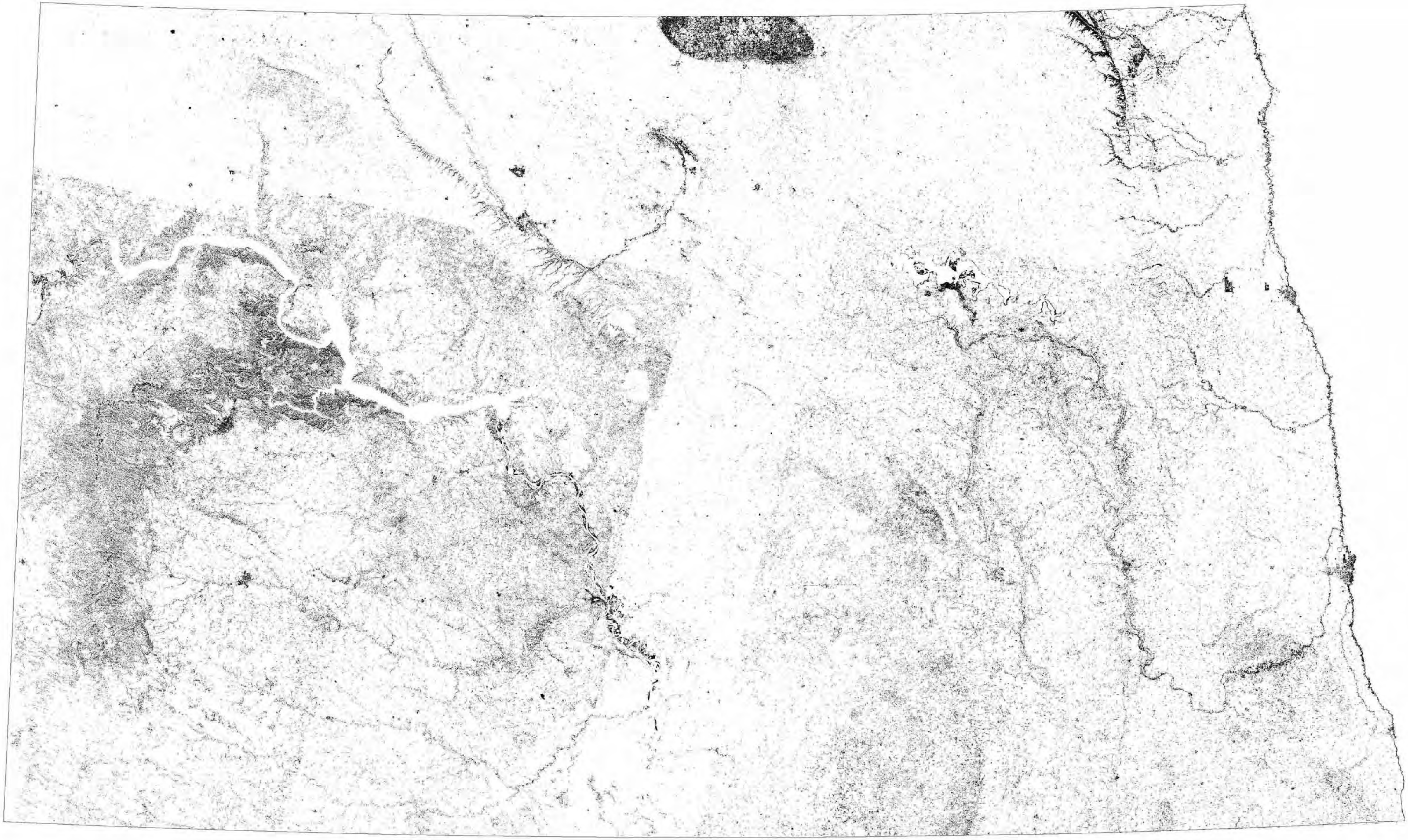
AMERICAN ROBIN(Turdus migratorius)



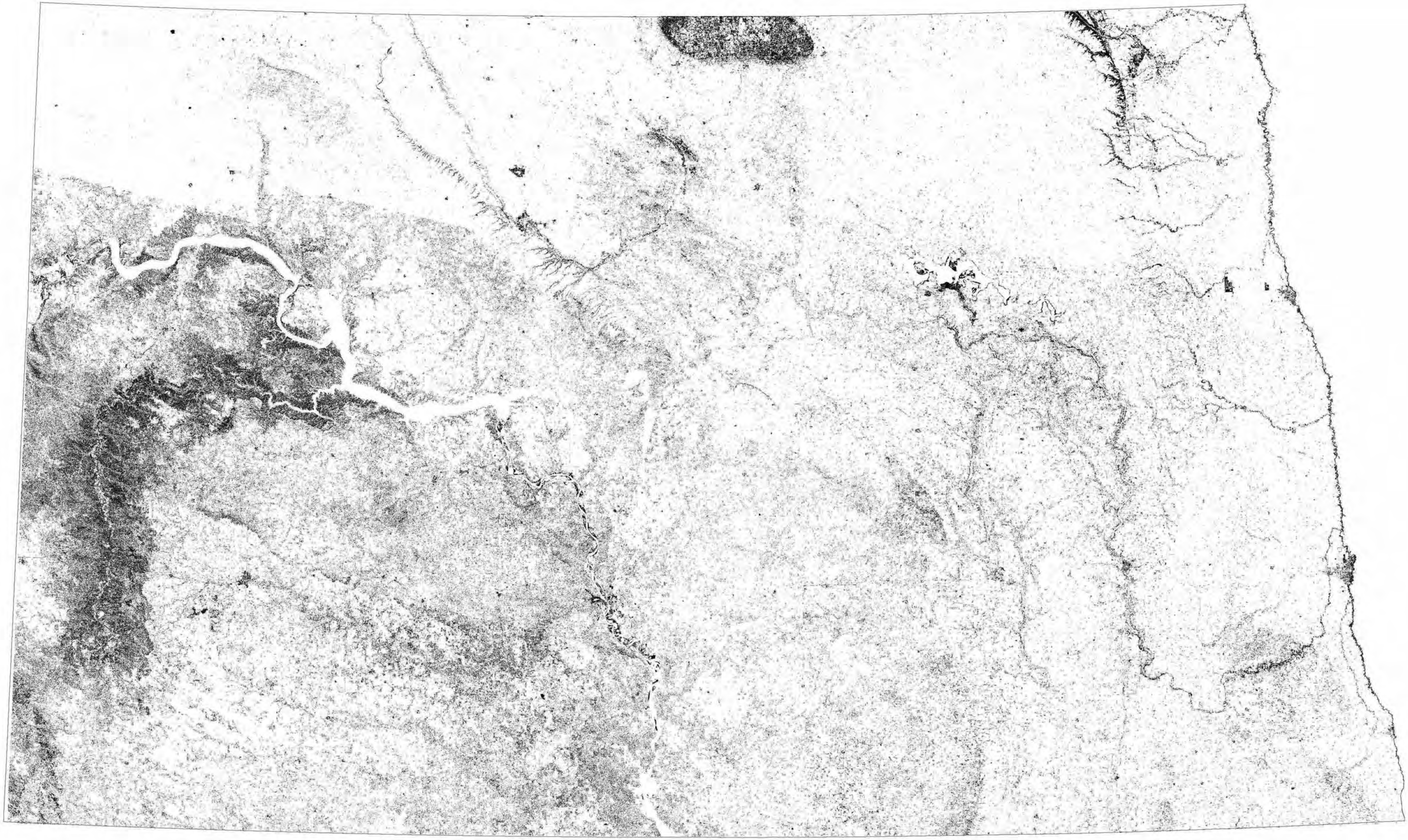
GRAY CATBIRD(Dumetella carolinensis)



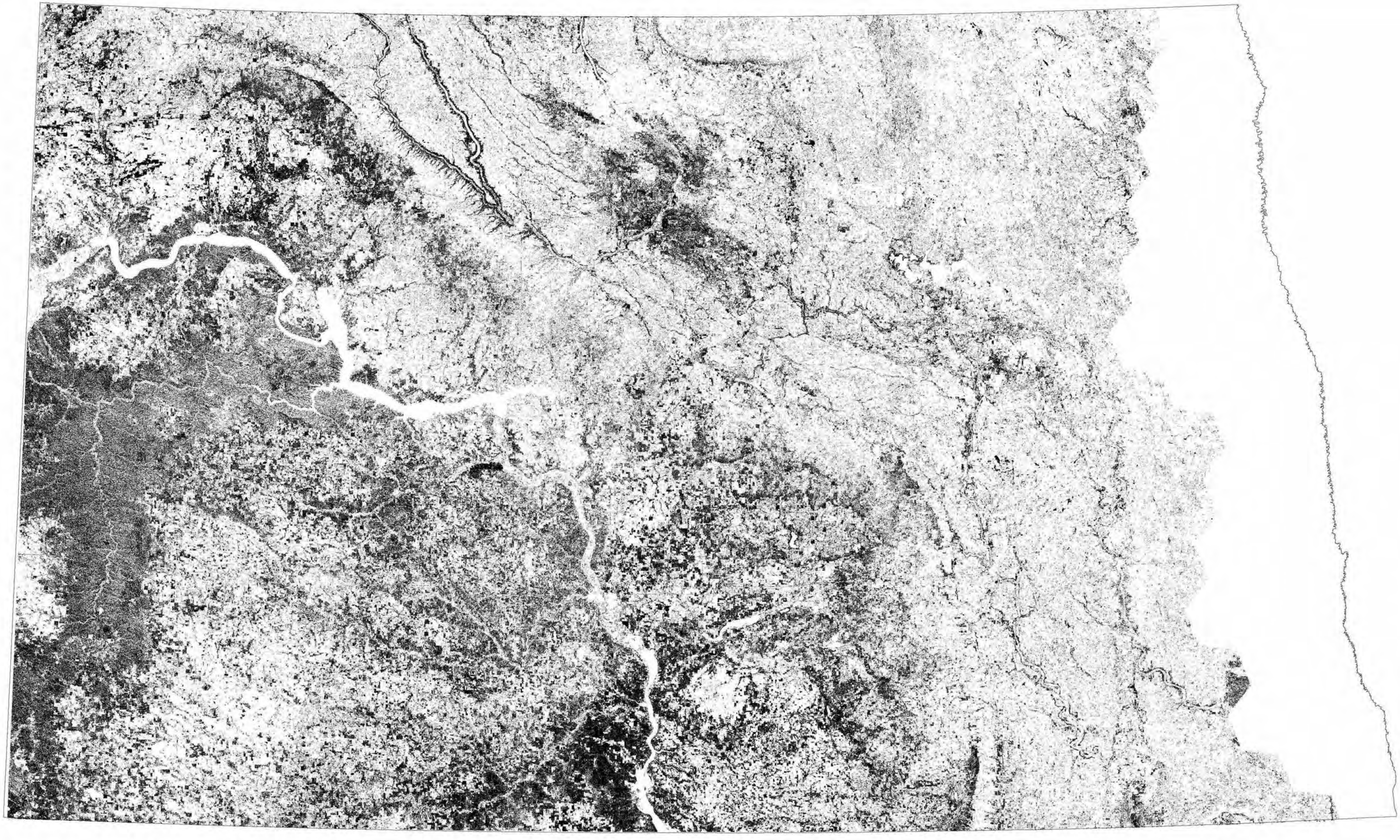
NORTHERN MOCKINGBIRD(Mimus polyglottos)



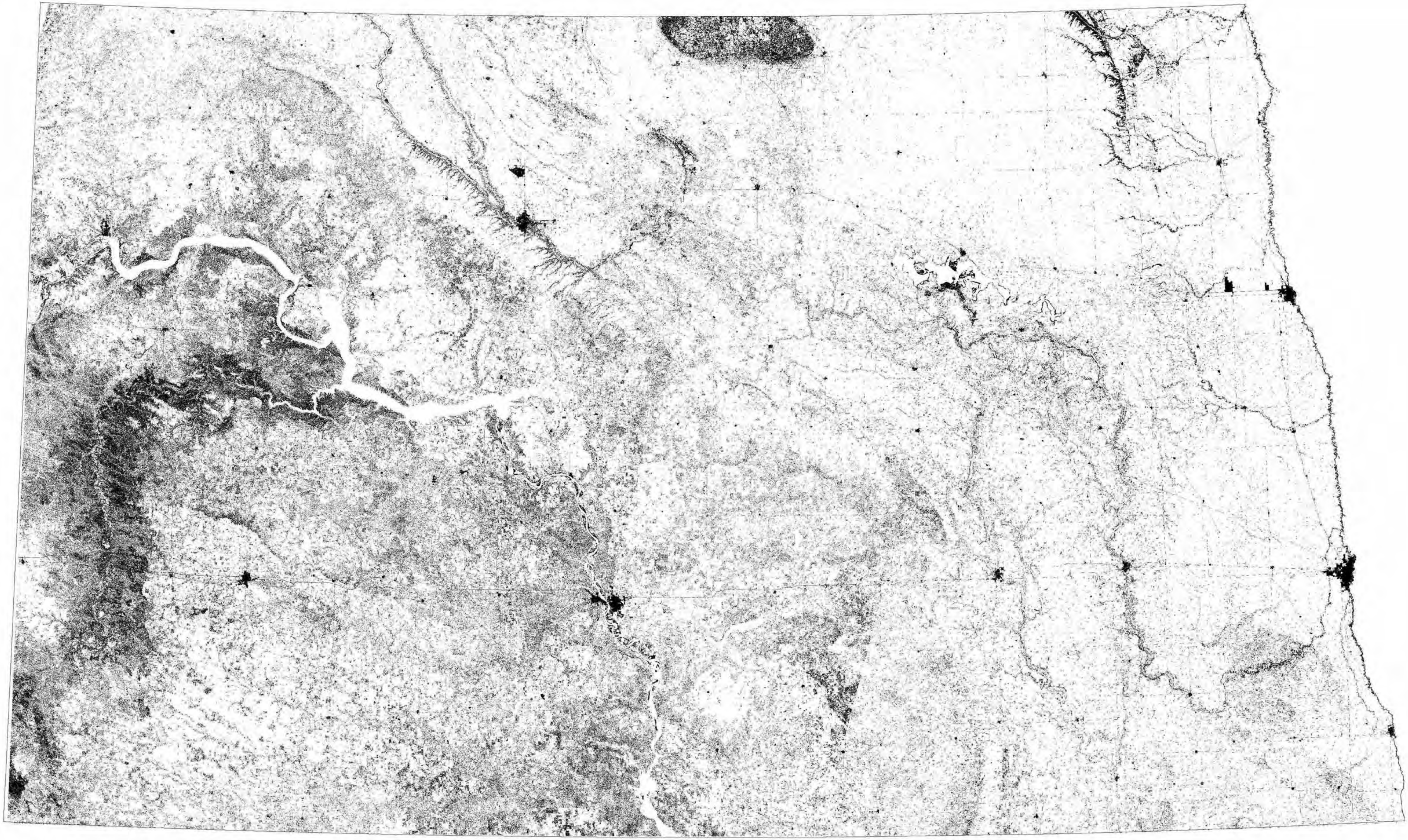
BROWN THRASHER(Toxostoma rufum)



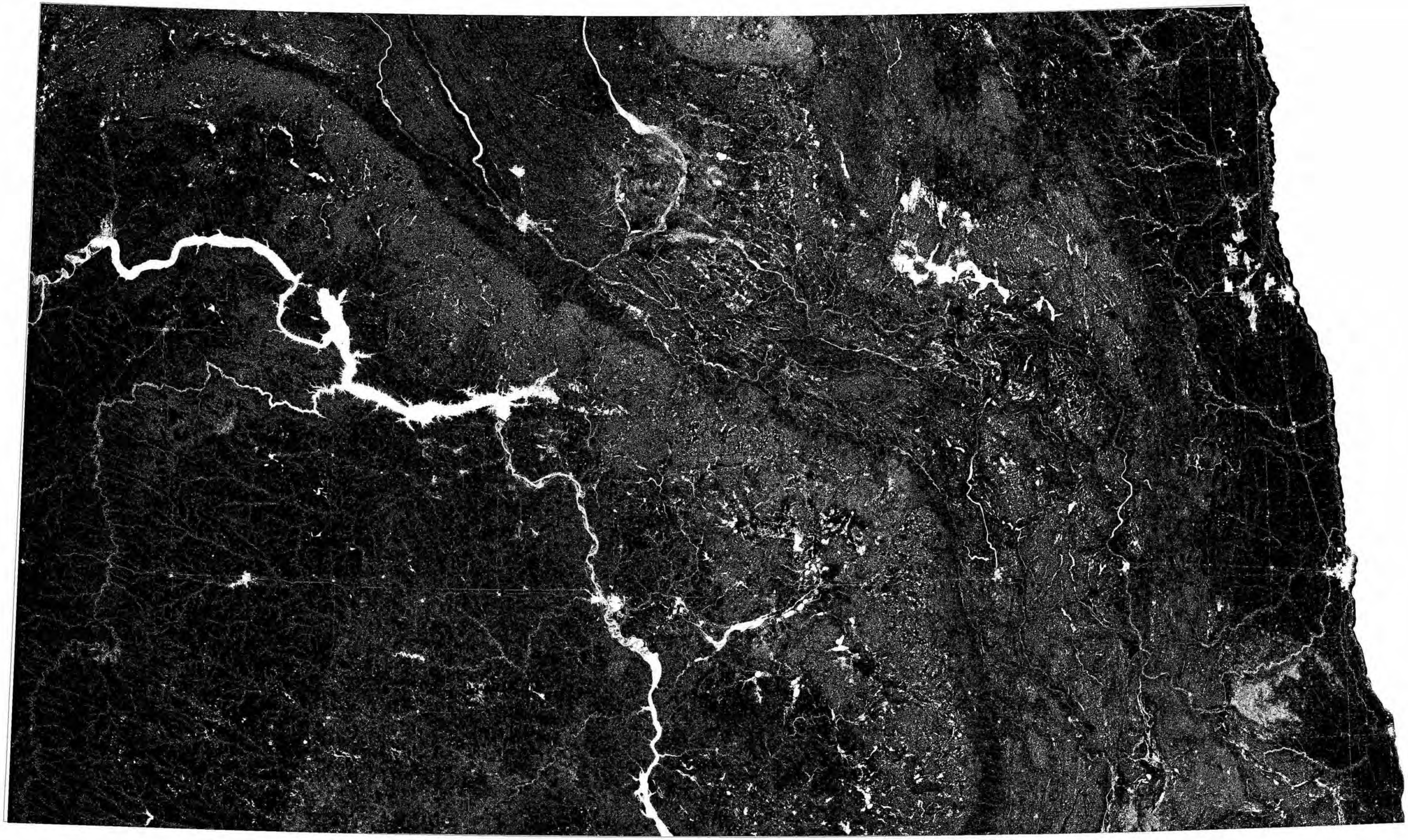
SPRAGUE'S PIPIT(Anthus spragueii)



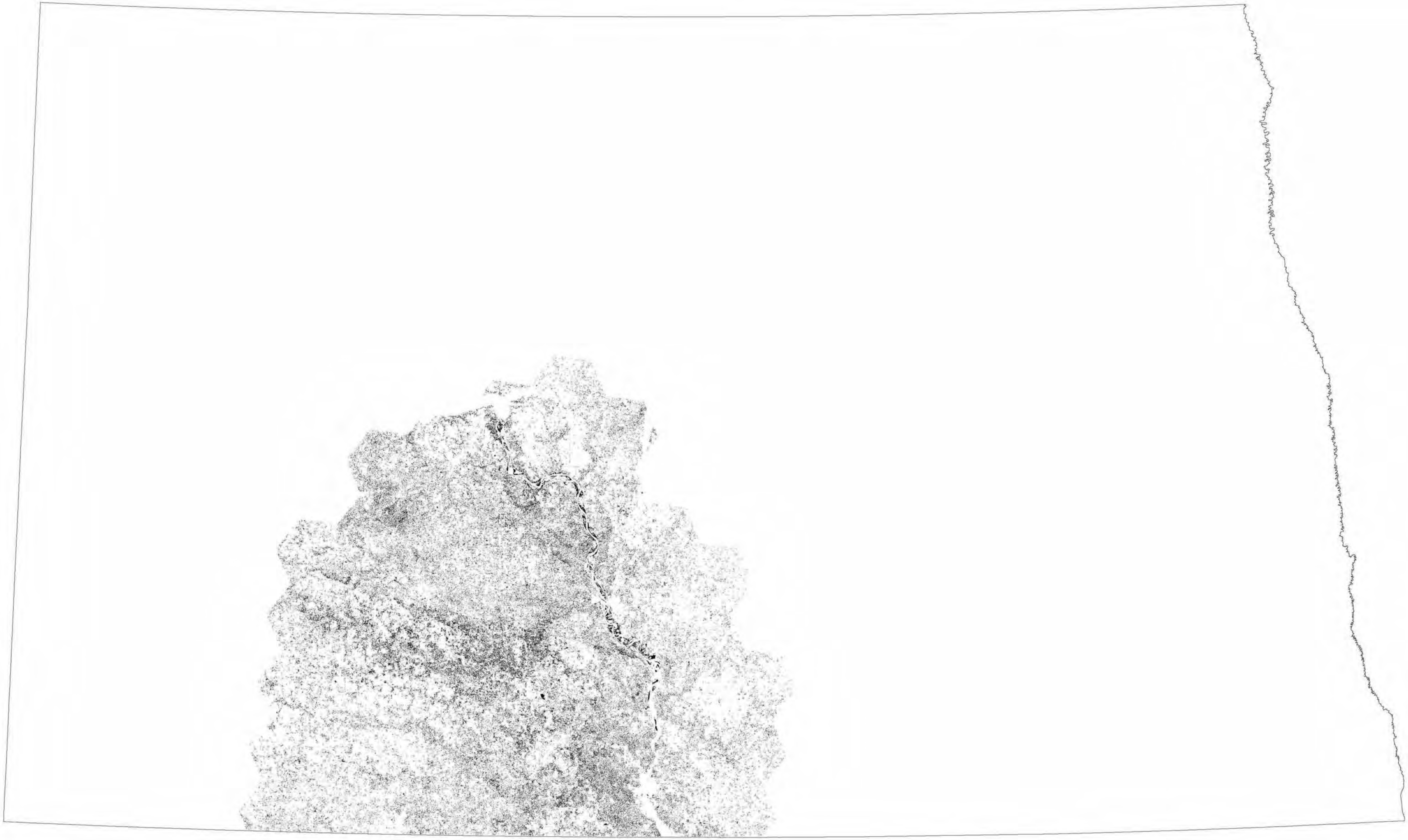
CEDAR WAXWING(Bombycilla cedrorum)



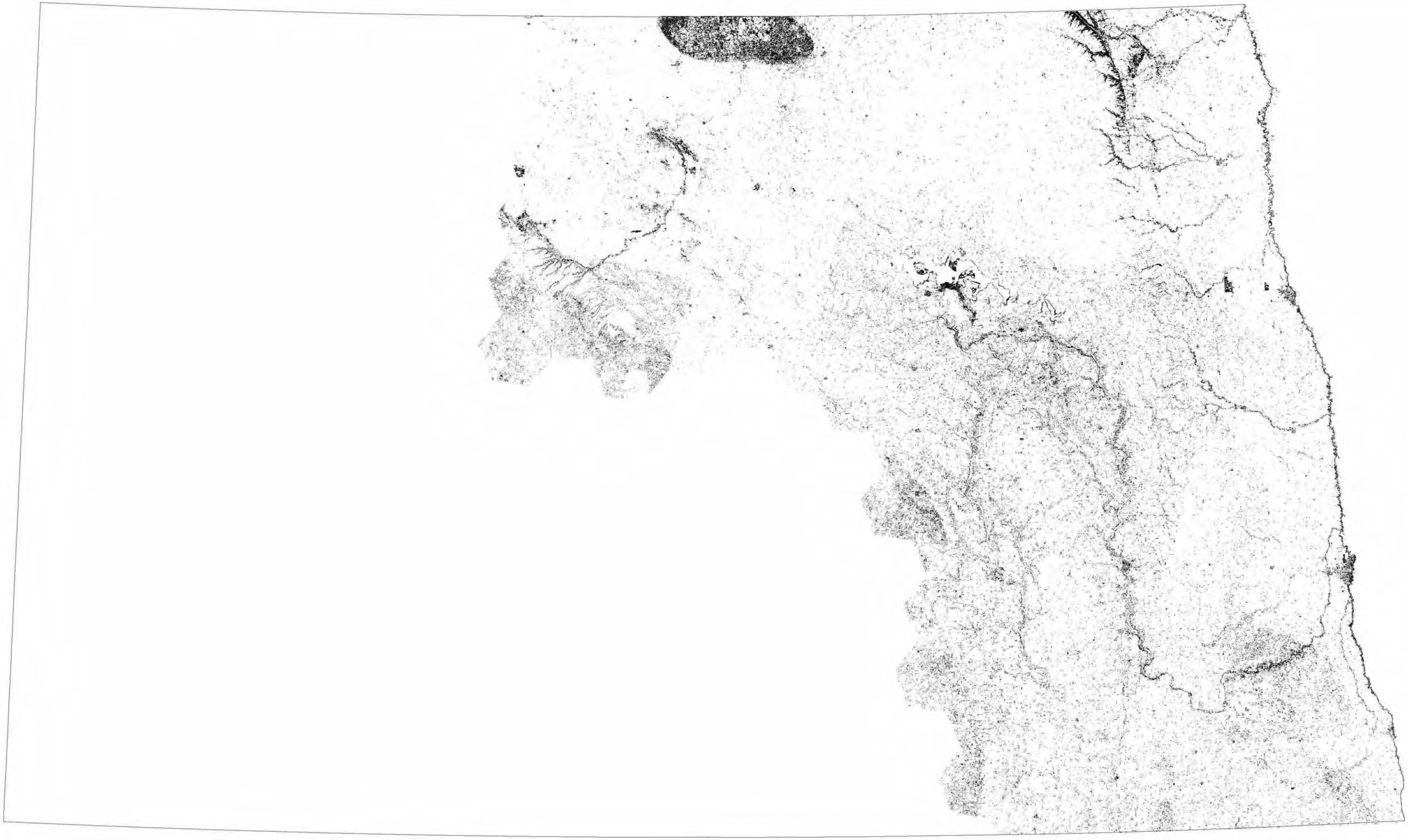
LOGGERHEAD SHRIKE(Lanius ludovicianus)



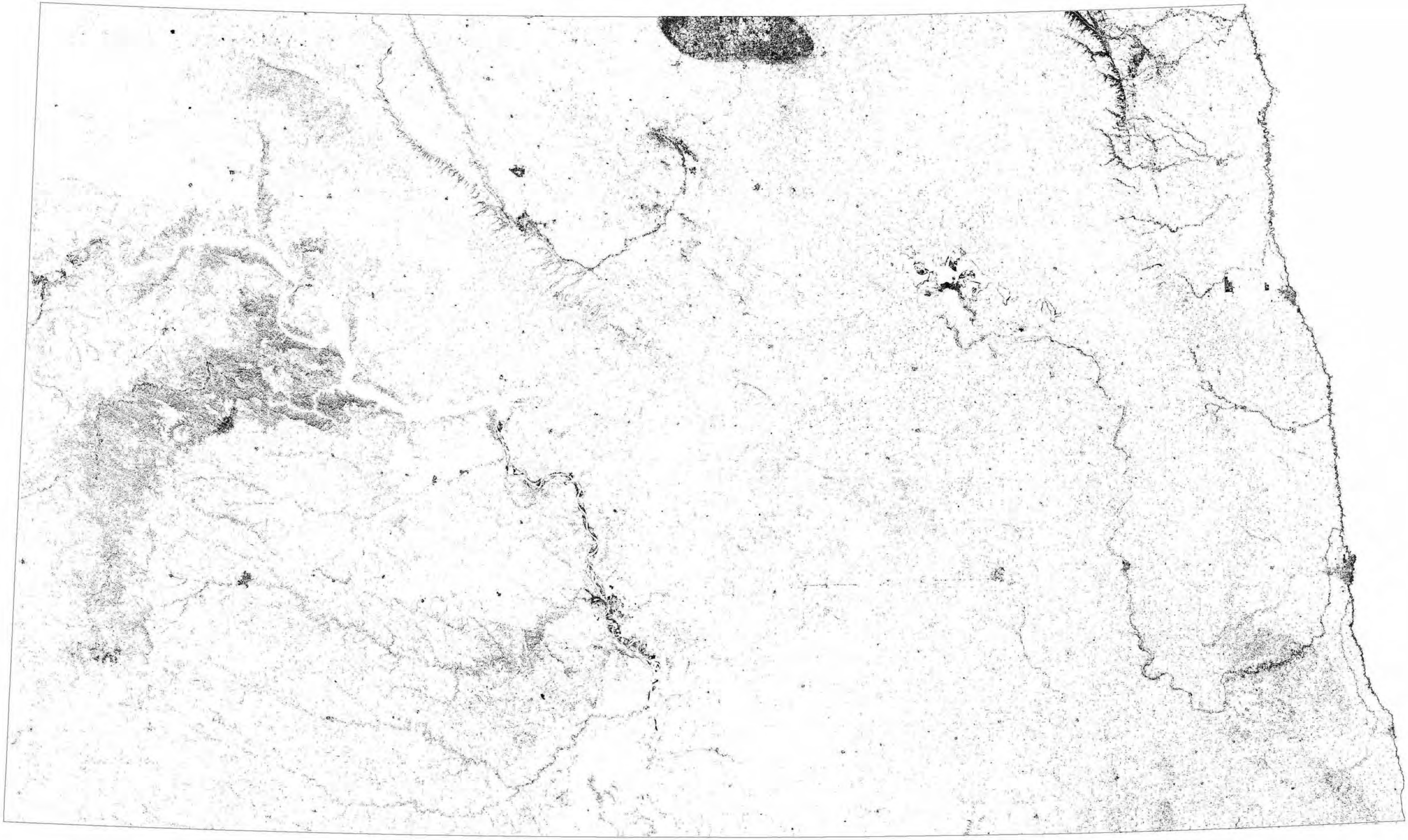
BELL'S VIREO(Vireo bellii)



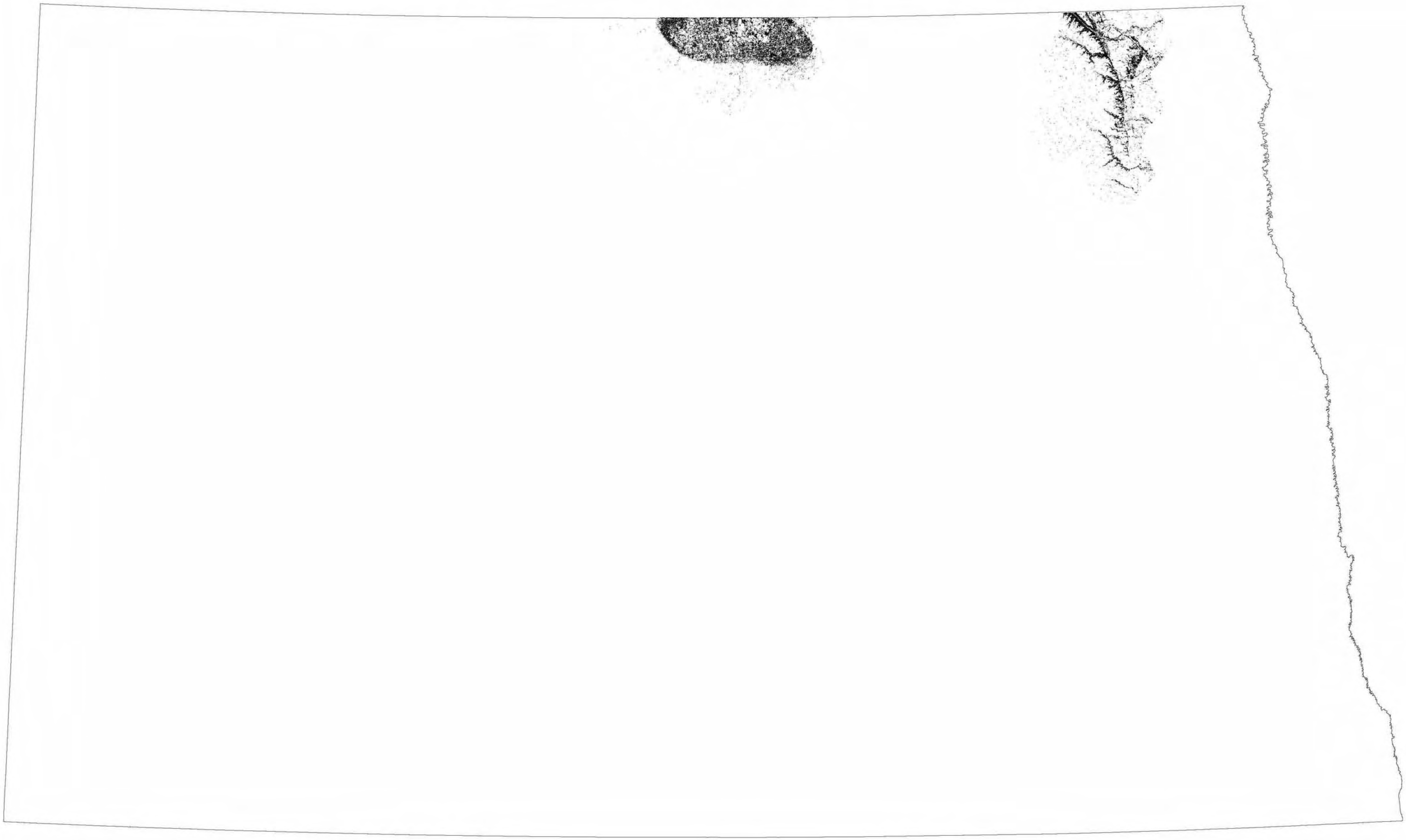
YELLOW-THROATED VIREO(Vireo flavifrons)



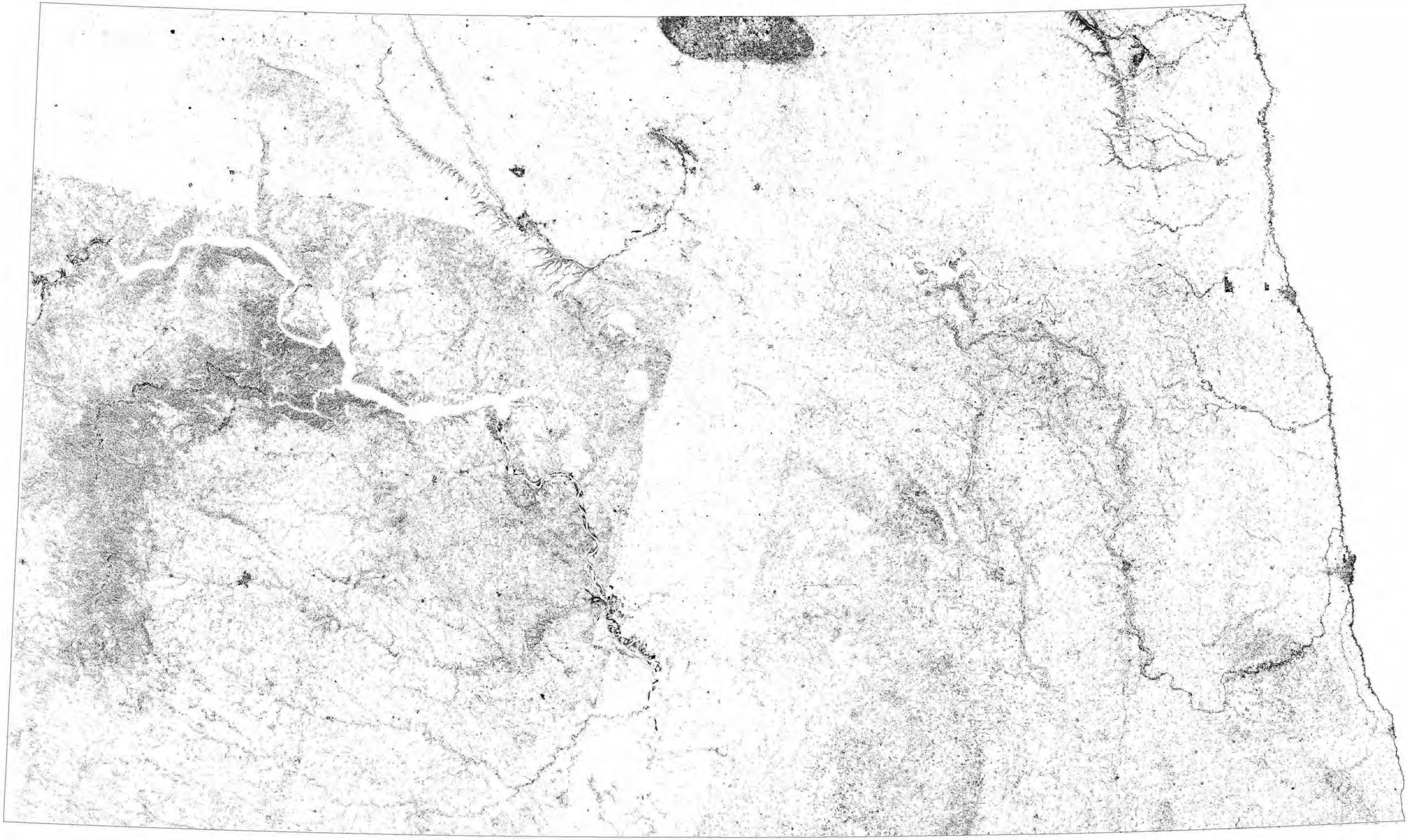
WARBLING VIREO(Vireo gilvus)



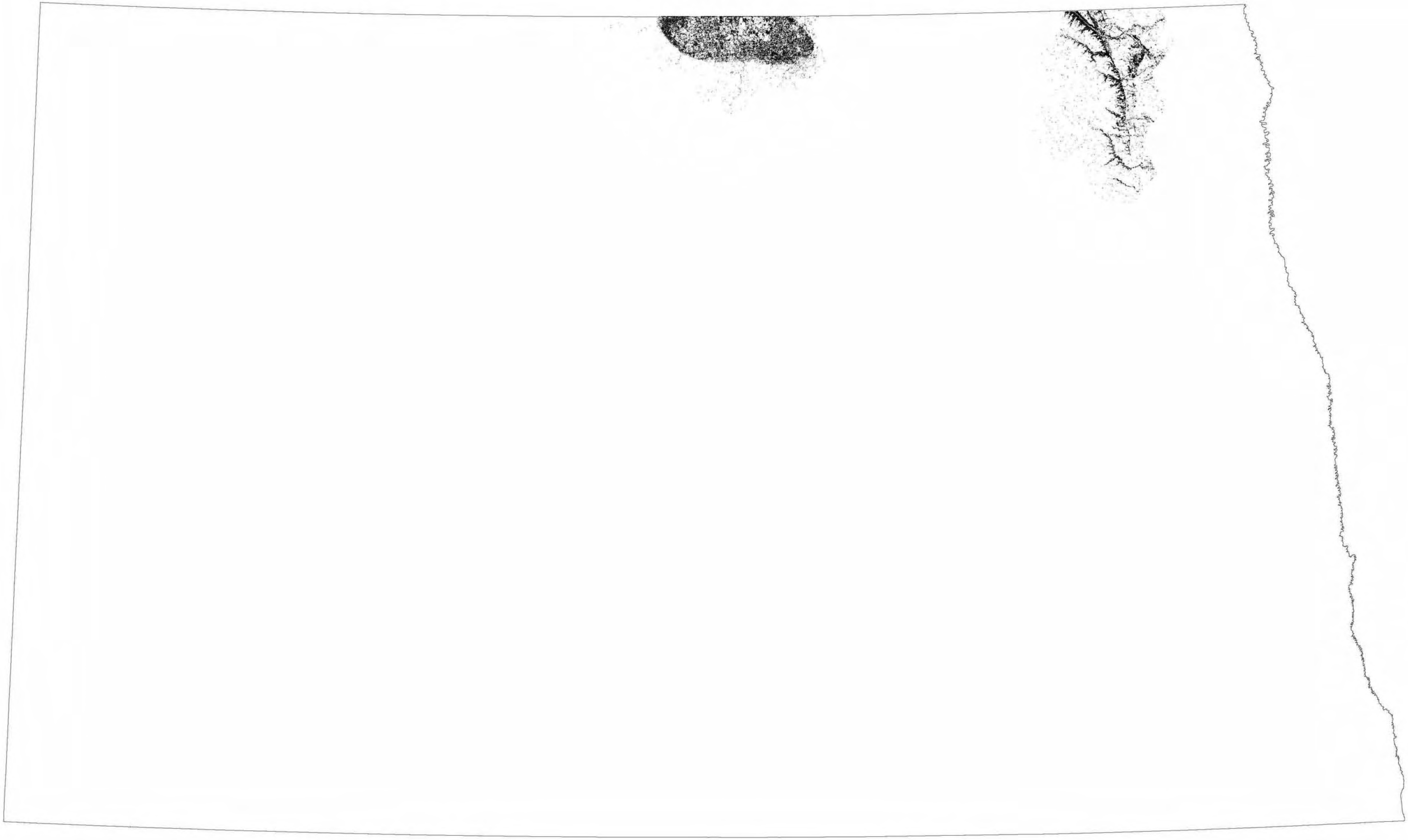
PHILADELPHIA VIREO(Vireo philadelphicus)



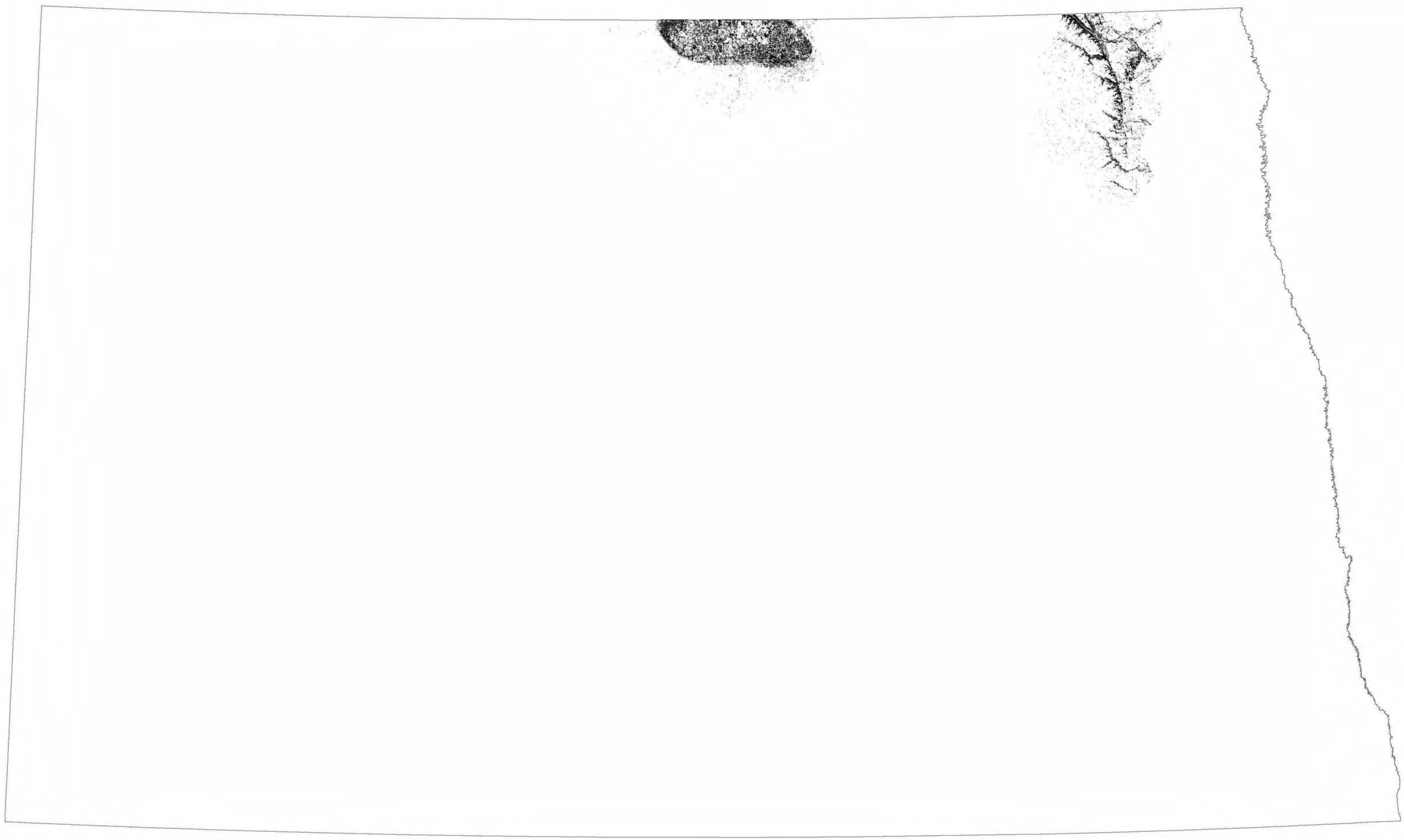
RED-EYED VIREO(Vireo olivaceus)



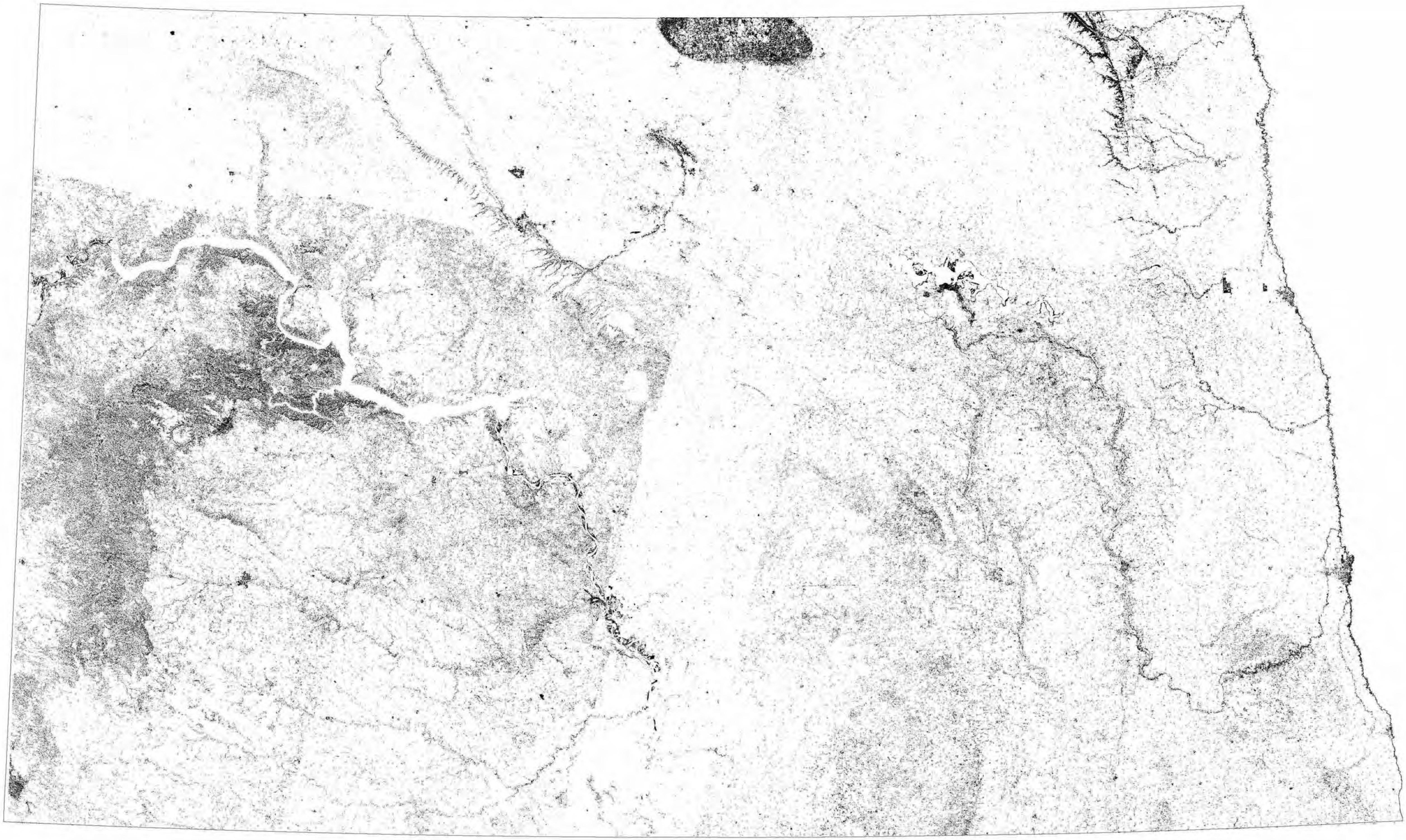
ORANGE-CROWNED WARBLER(Vermivora celata)



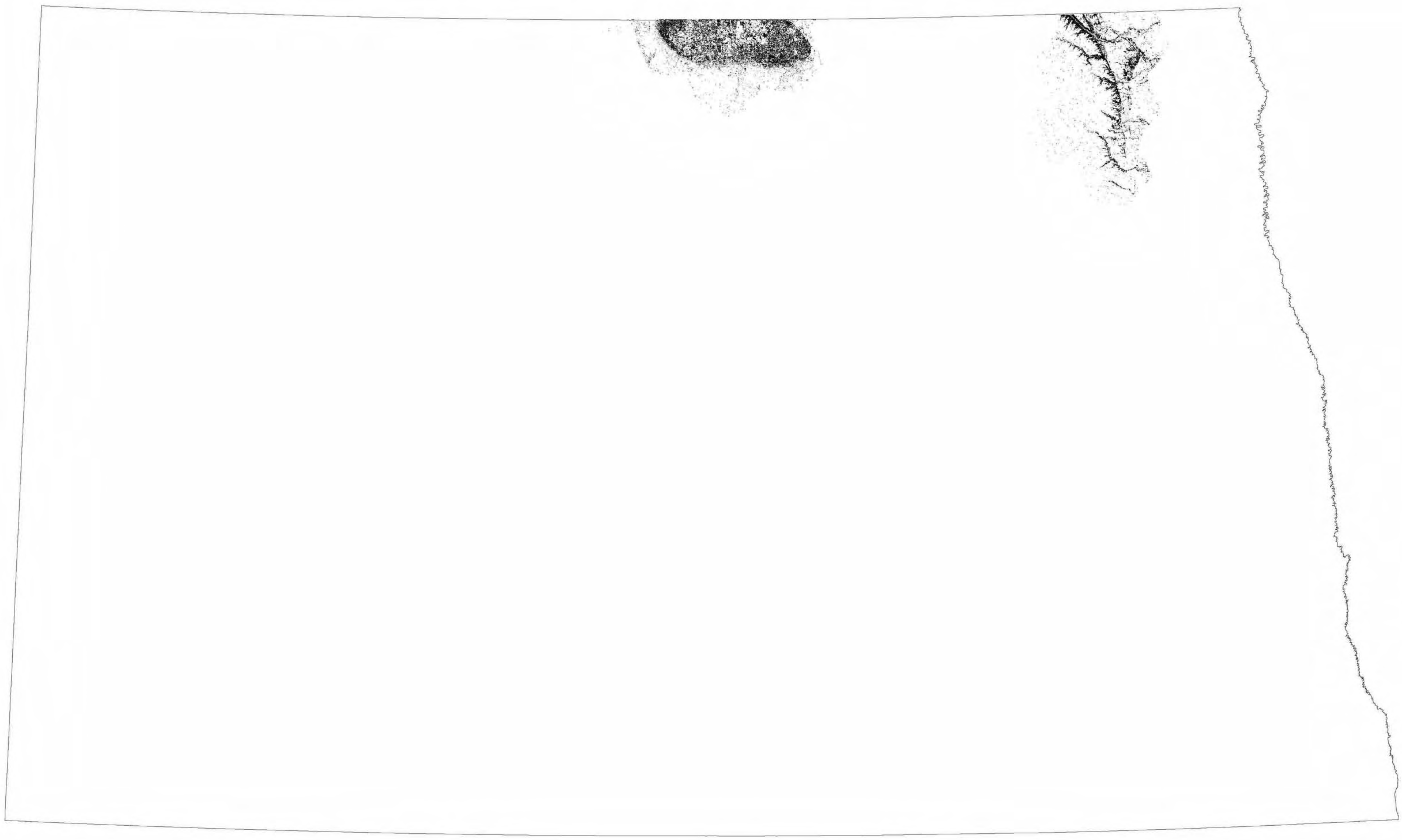
NASHVILLE WARBLER(Vermivora ruficapilla)



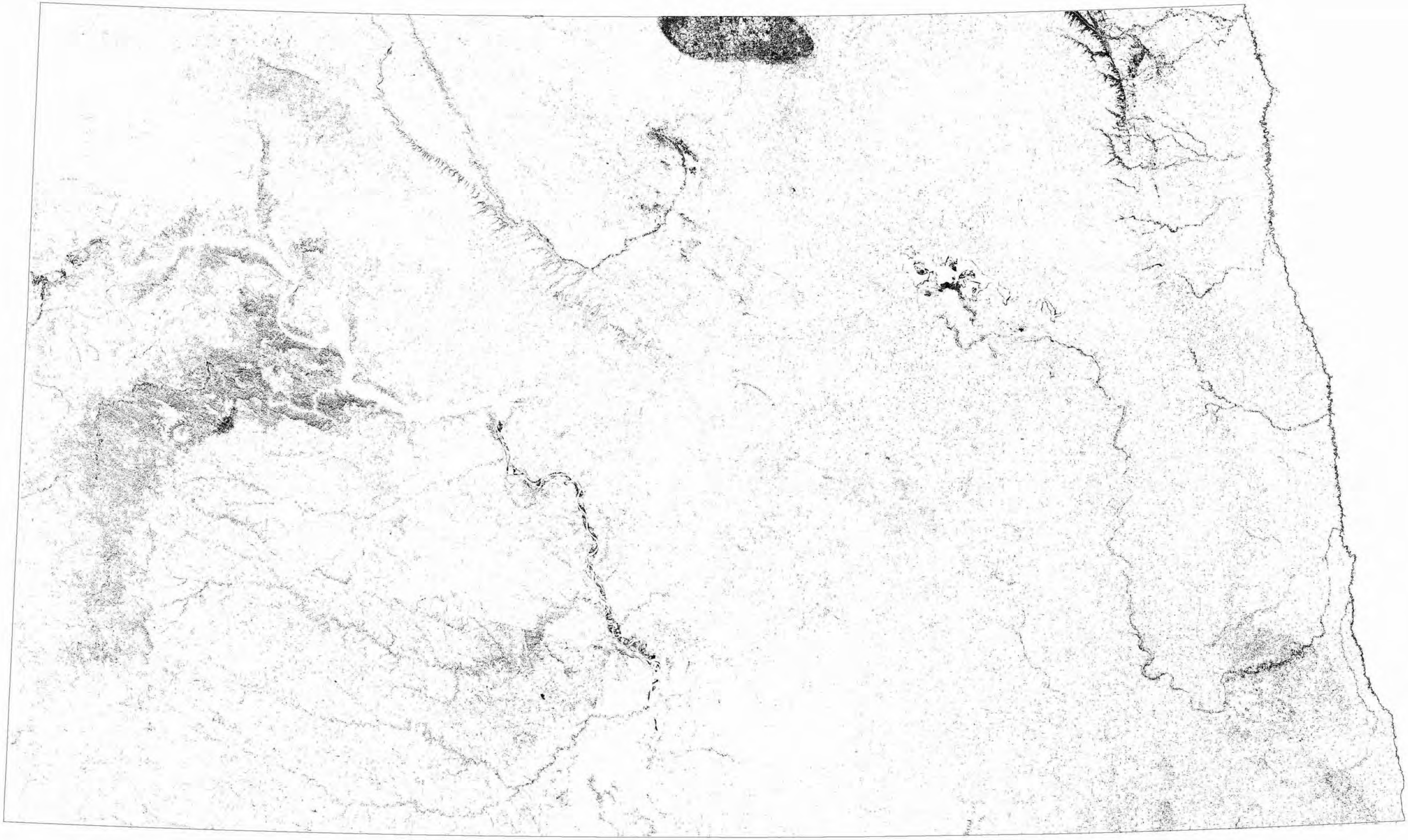
YELLOW WARBLER(Dendroica petechia)



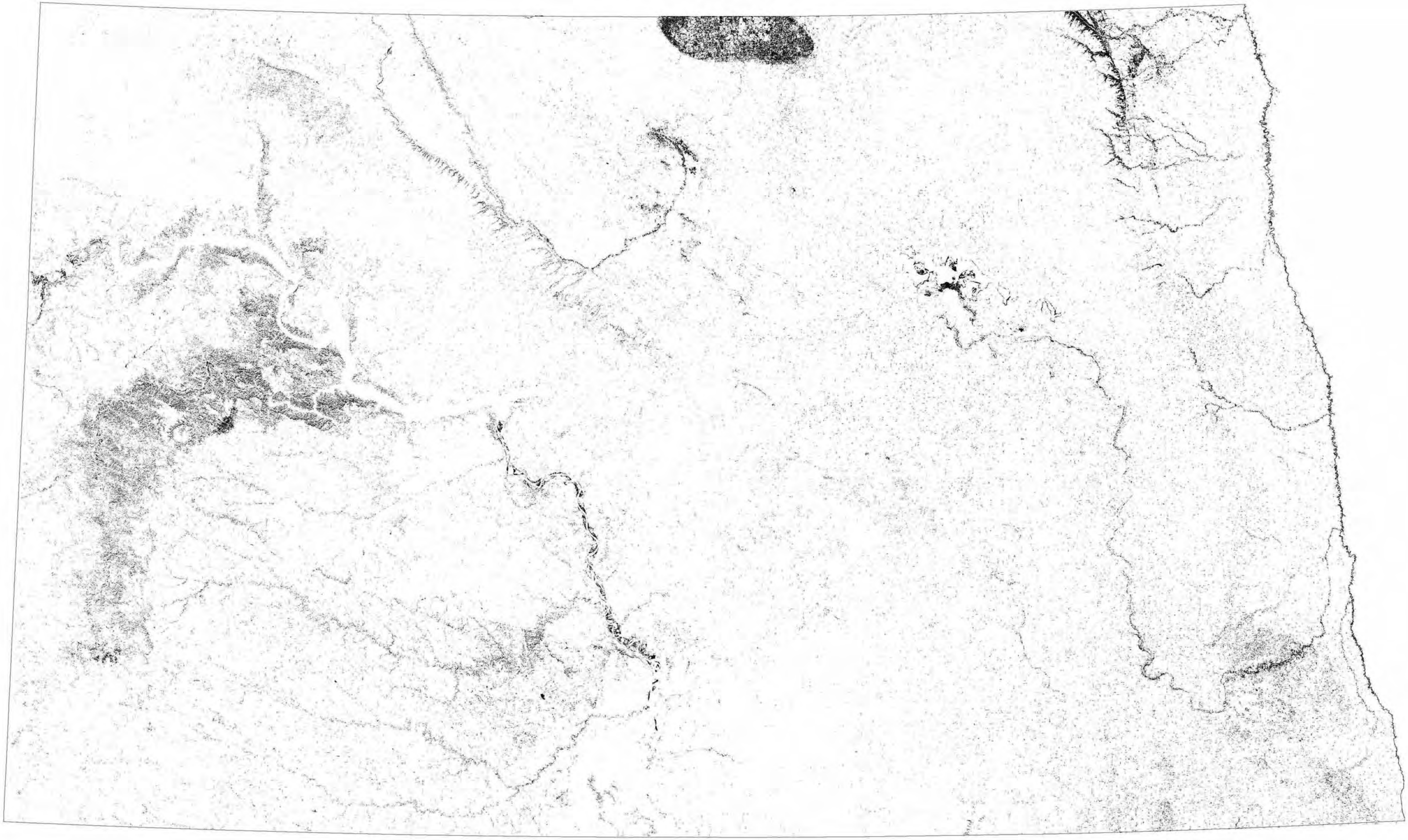
CHESTNUT-SIDED WARBLER(Dendroica pensylvanica)



BLACK-AND-WHITE WARBLER(Mniotilta varia)



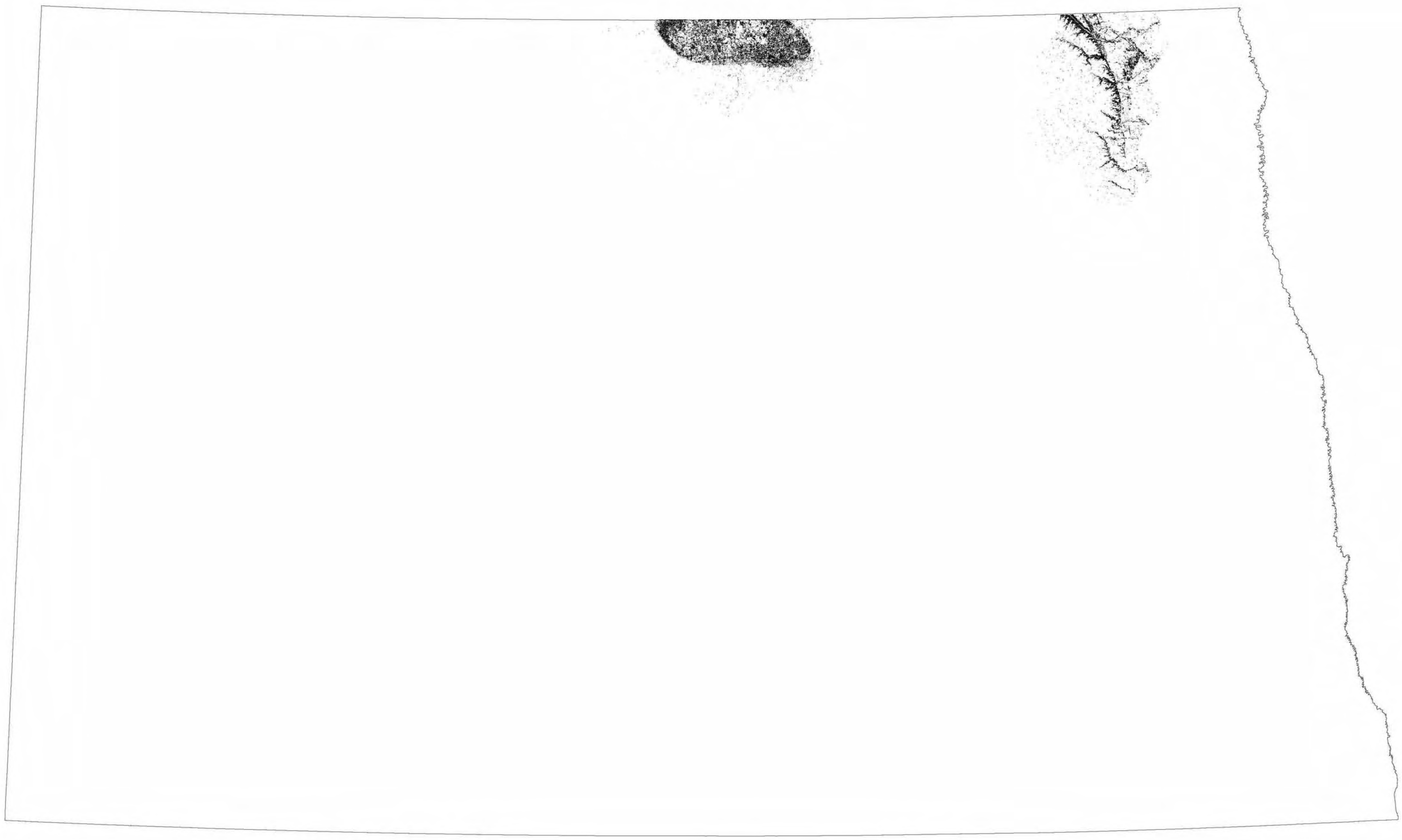
AMERICAN REDSTART(Setophaga ruticilla)



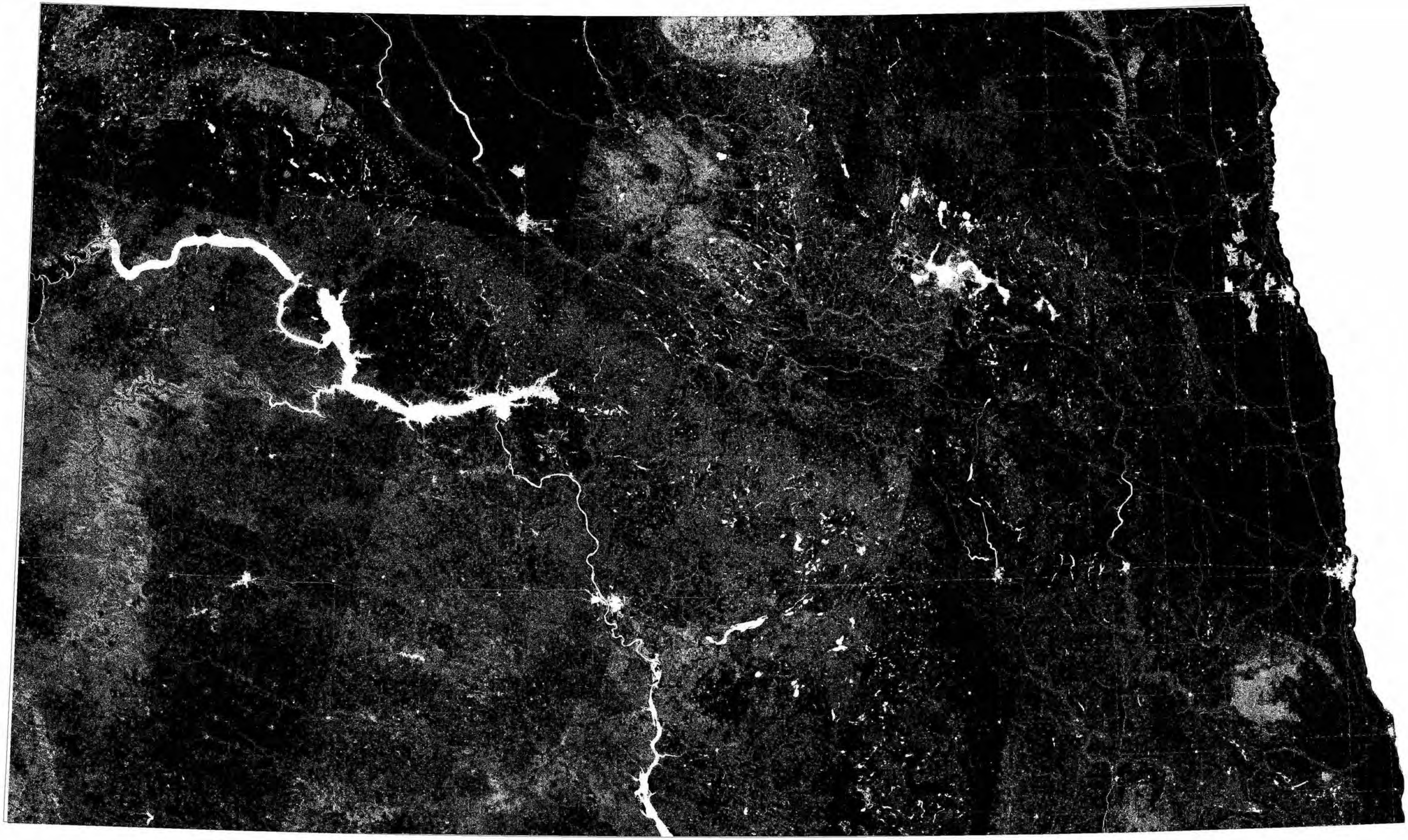
OVENBIRD(Seiurus aurocapillus)

NORTHERN WATERTHRUSH(Seiurus noveboracensis)

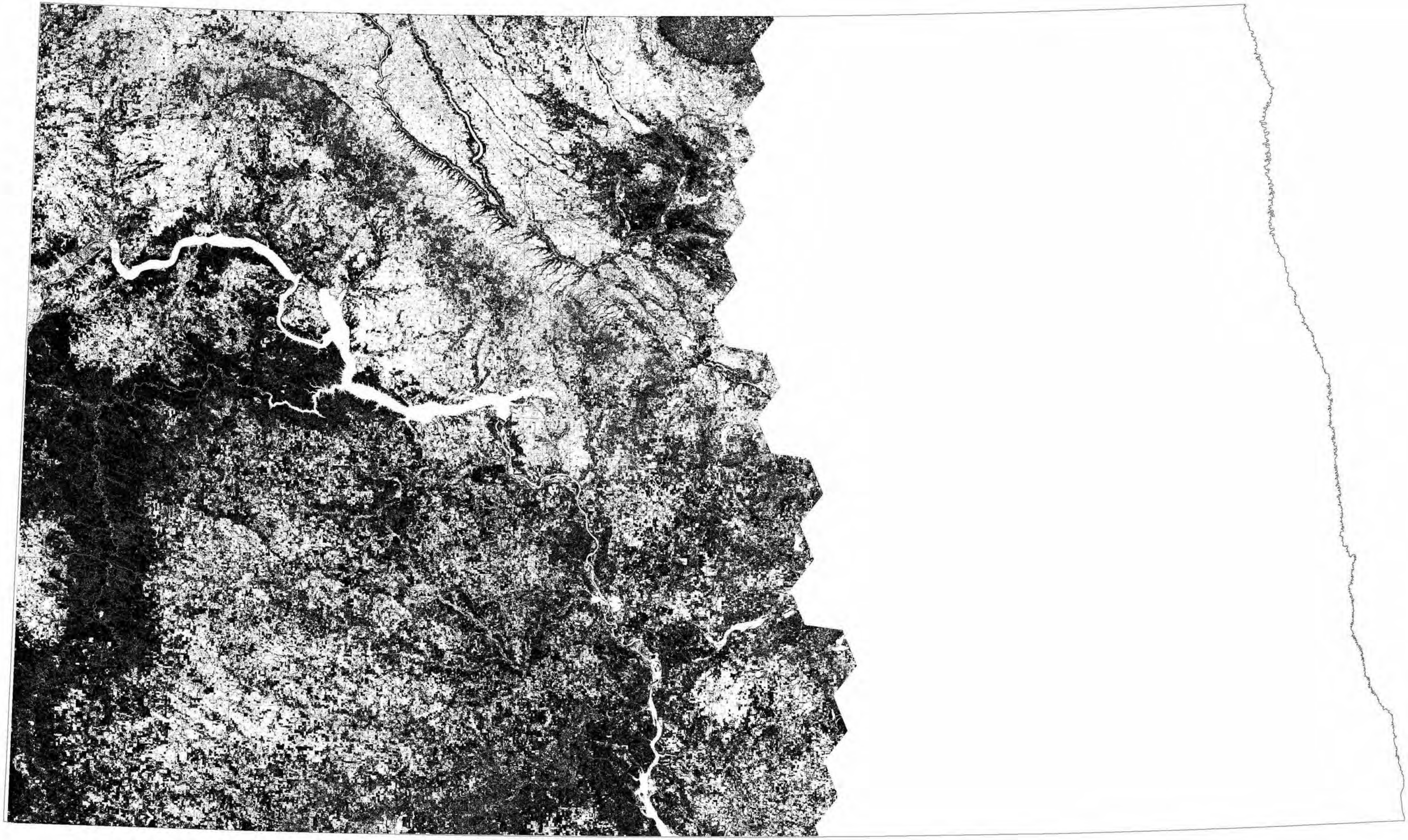
MOURNING WARBLER(Oporornis philadelphia)



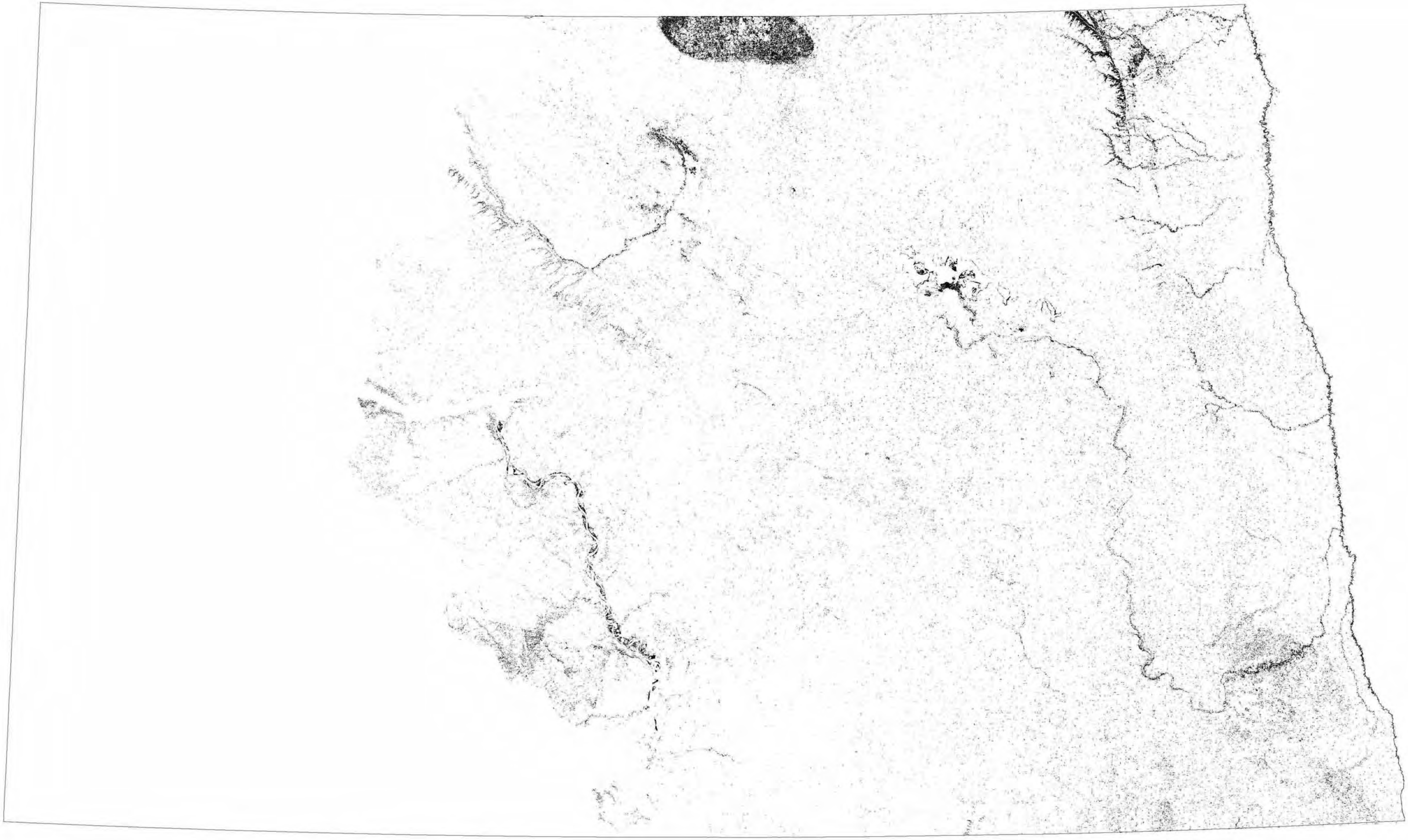
COMMON YELLOWTHROAT(Geothlypis trichas)



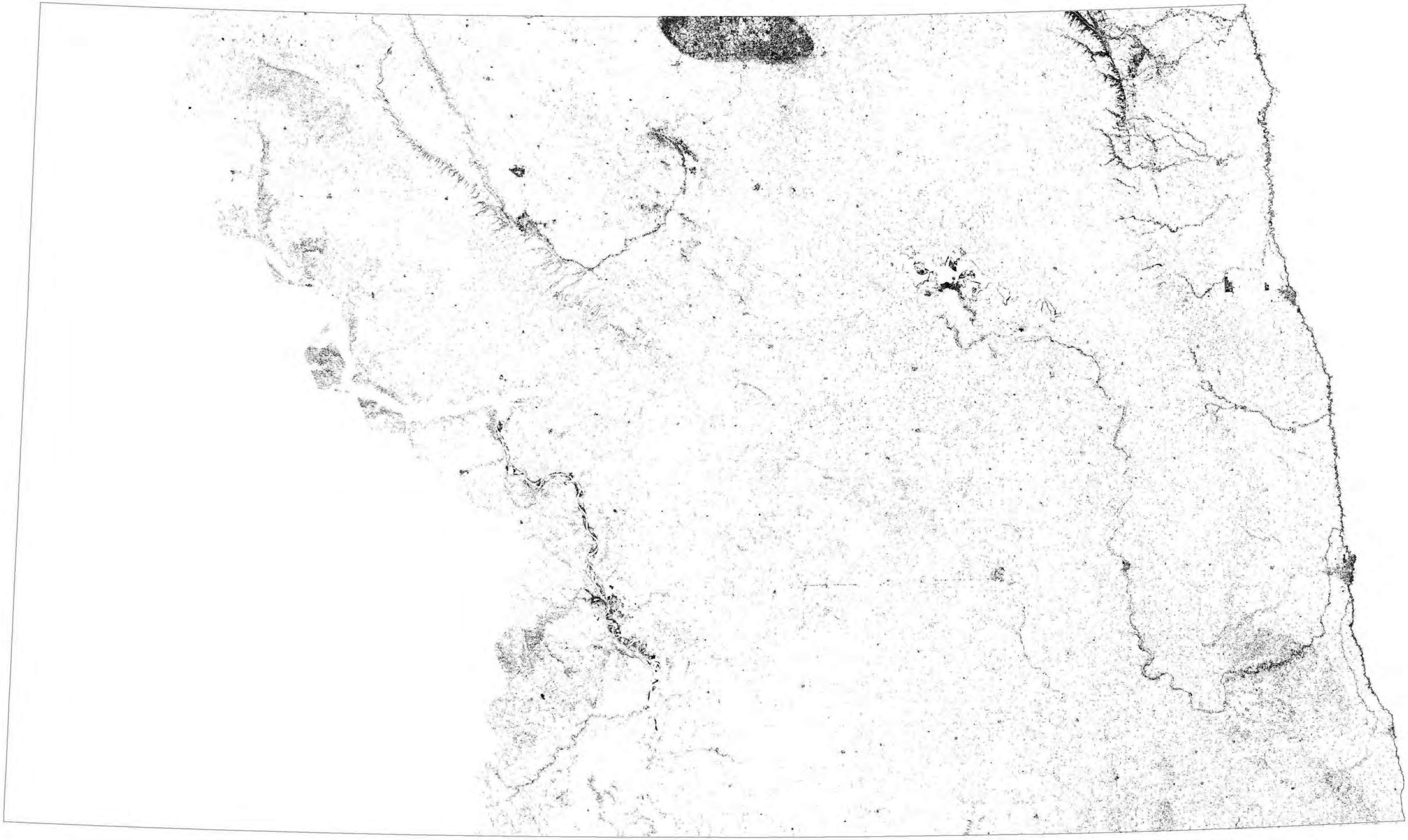
YELLOW-BREASTED CHAT(Icteria virens)



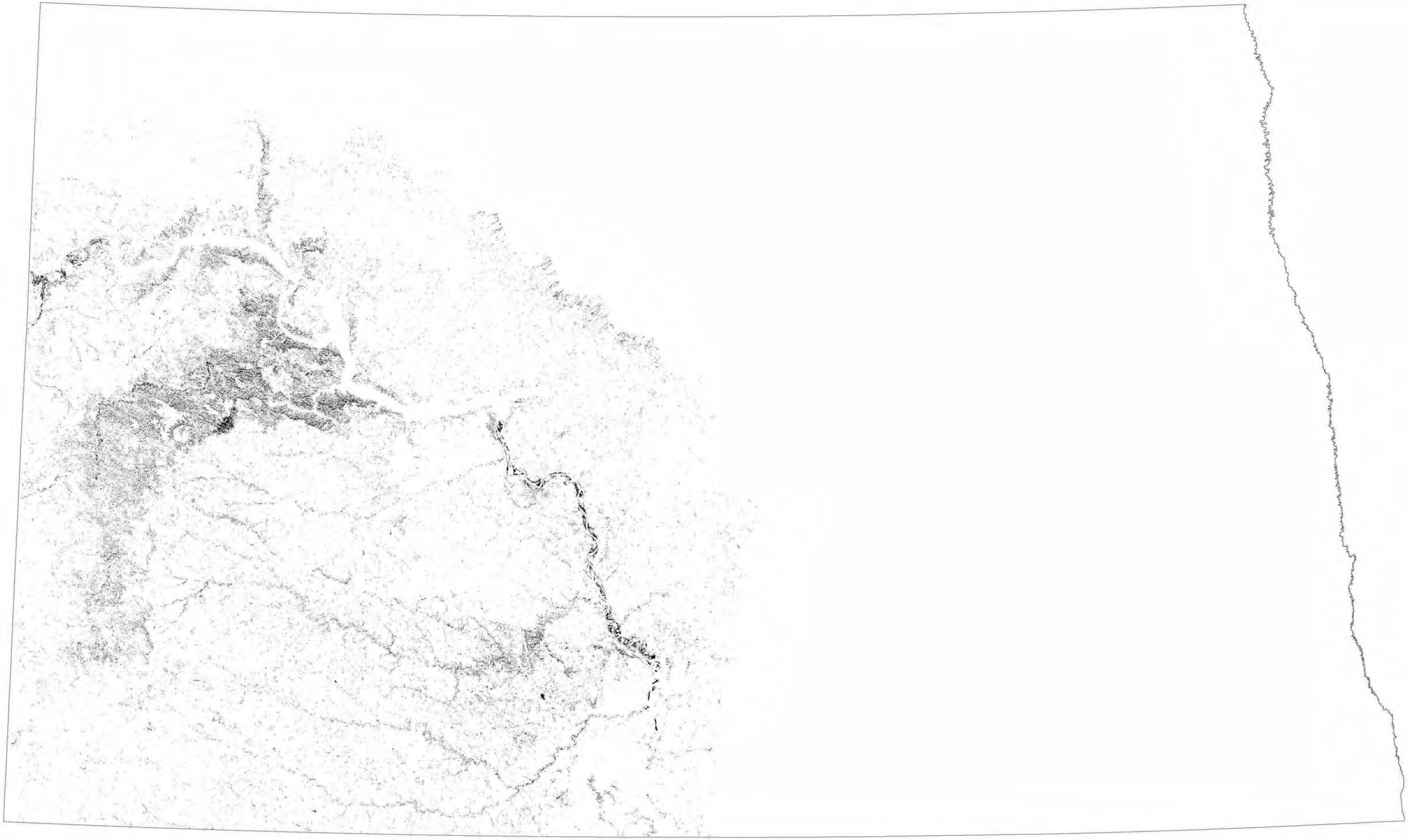
SCARLET TANAGER(Piranga olivacea)



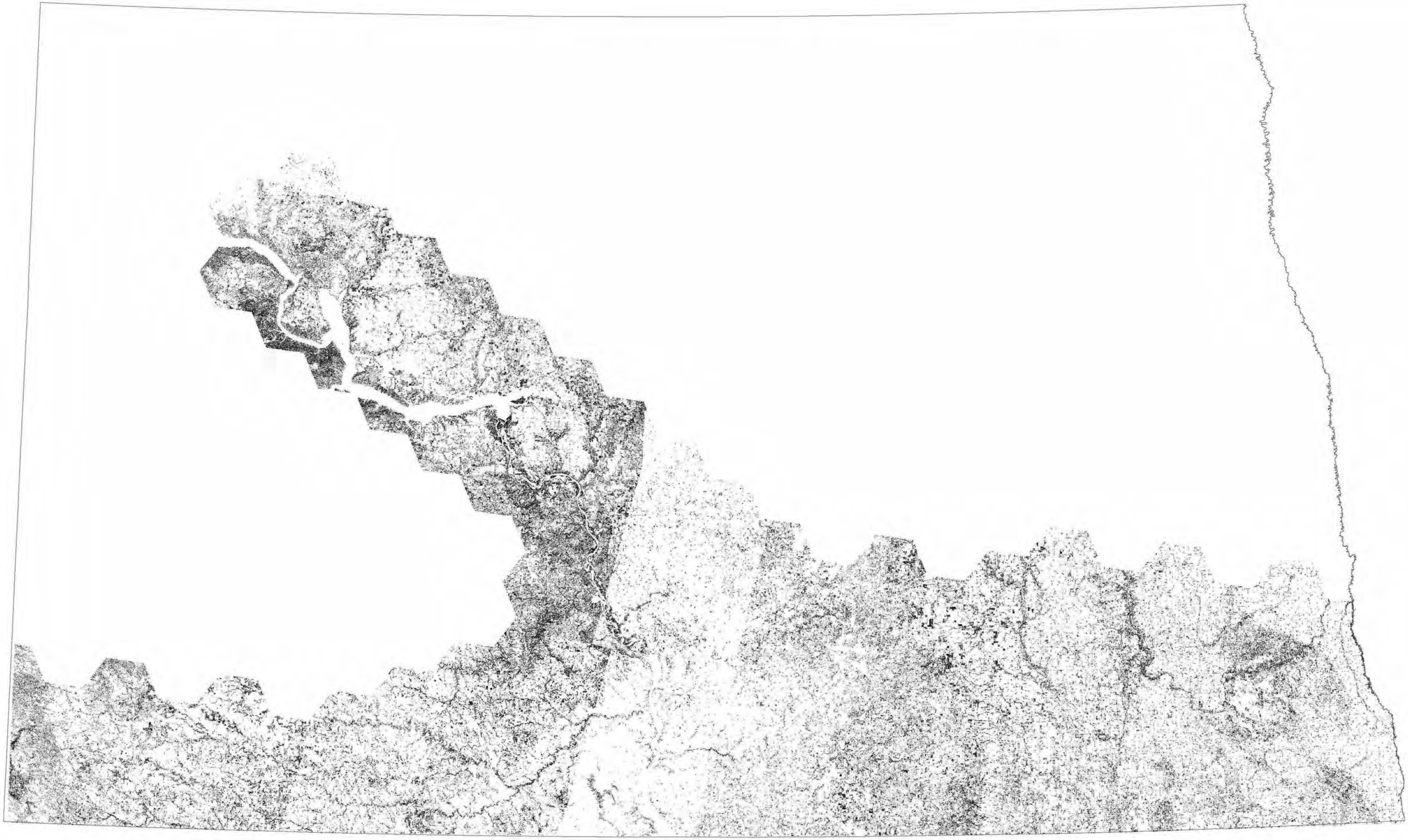
ROSE-BREASTED GROSBEAK(Pheucticus ludovicianus)



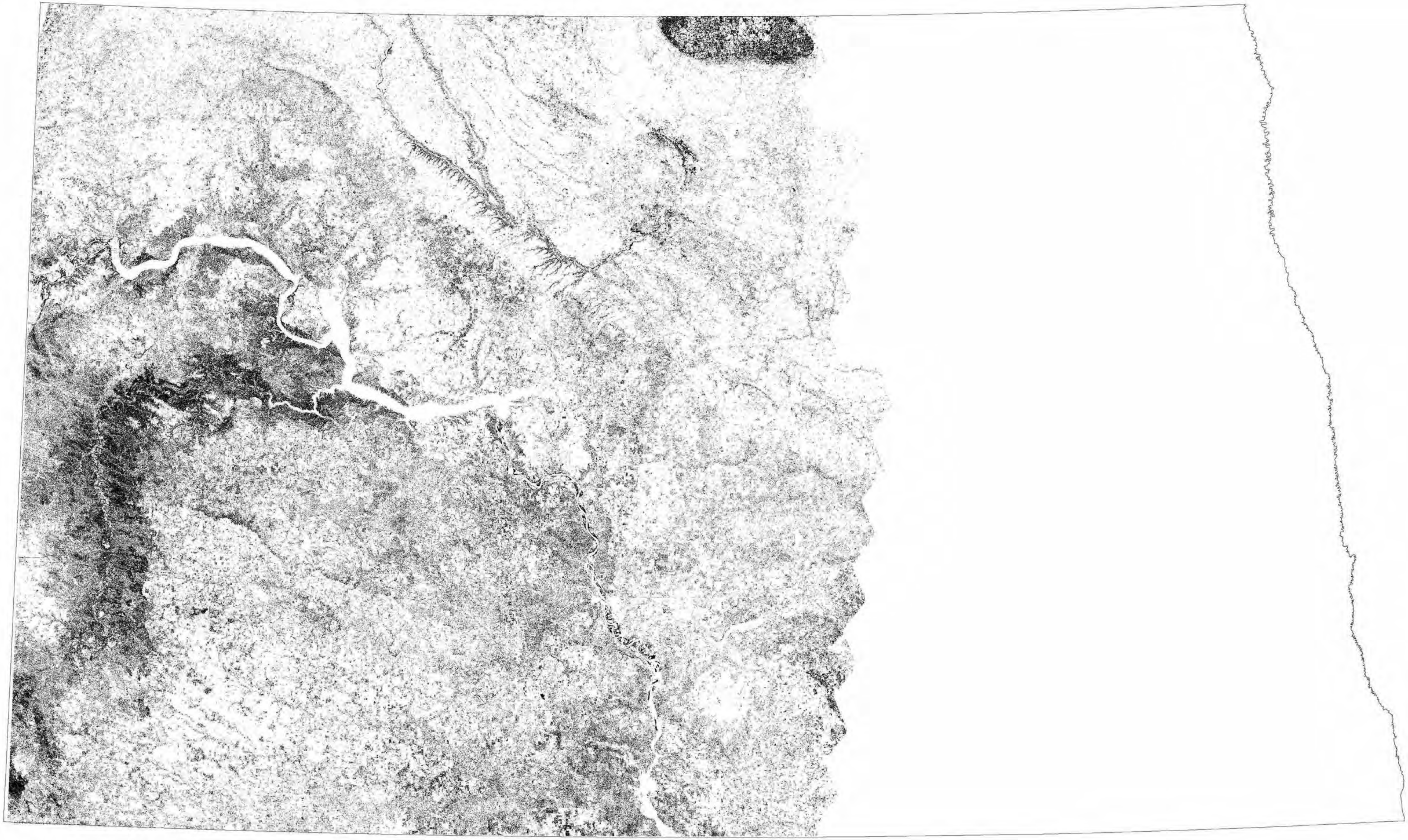
BLACK-HEADED GROSBEAK(Pheucticus melanocephalus



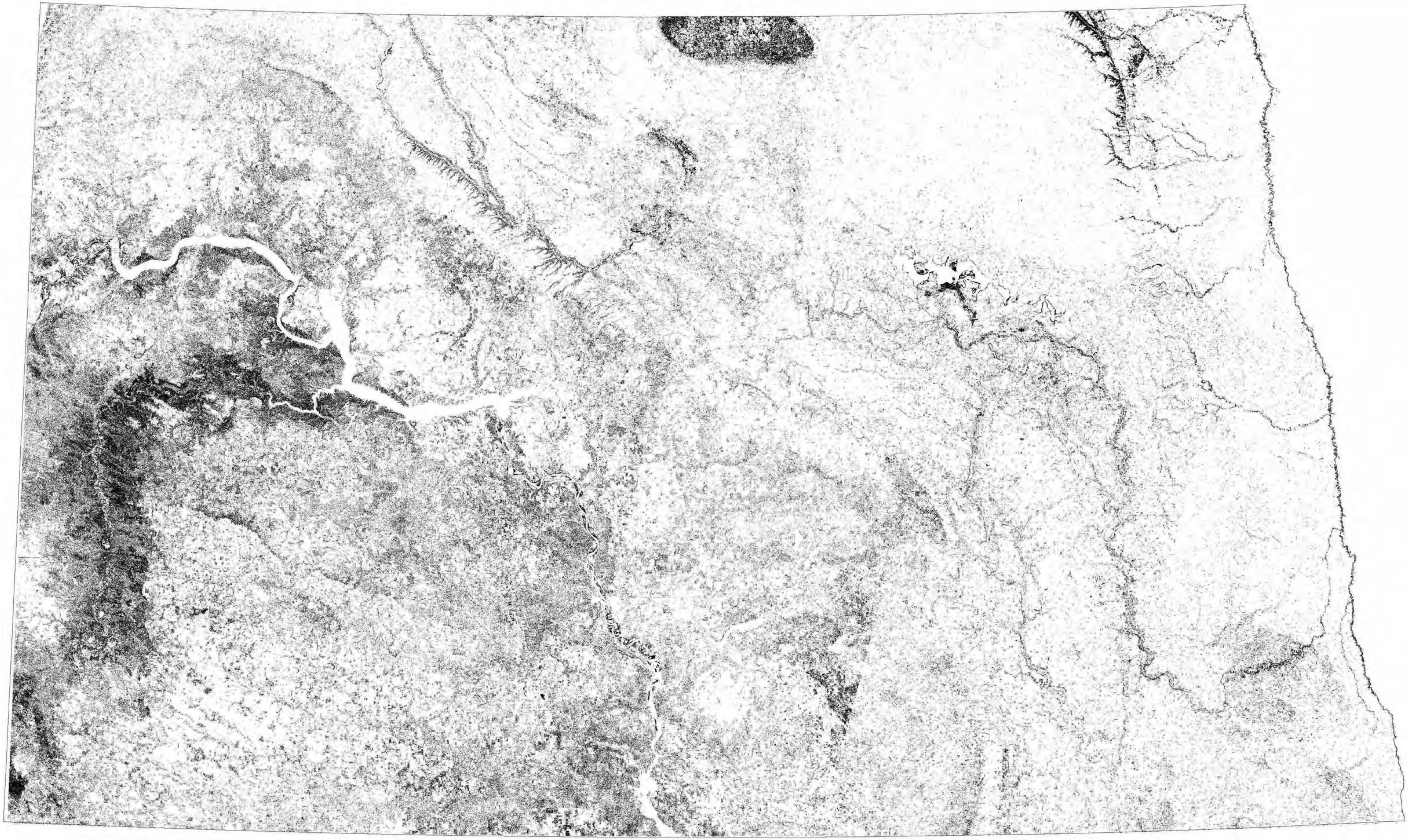
BLUE GROSBEAK(Guiraca caerulea)



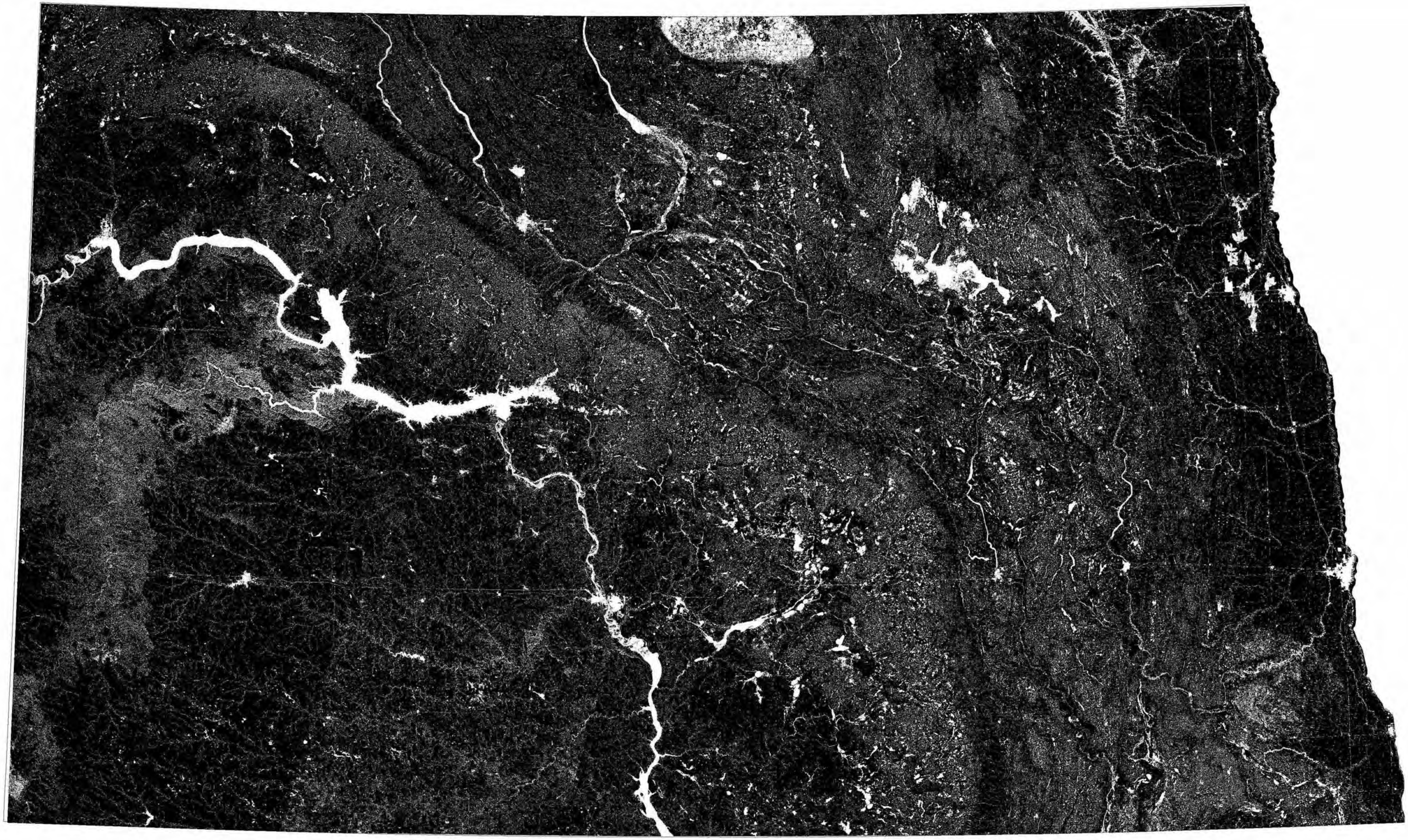
LAZULI BUNTING(Passerina amoena)



INDIGO BUNTING(Passerina cyanea)

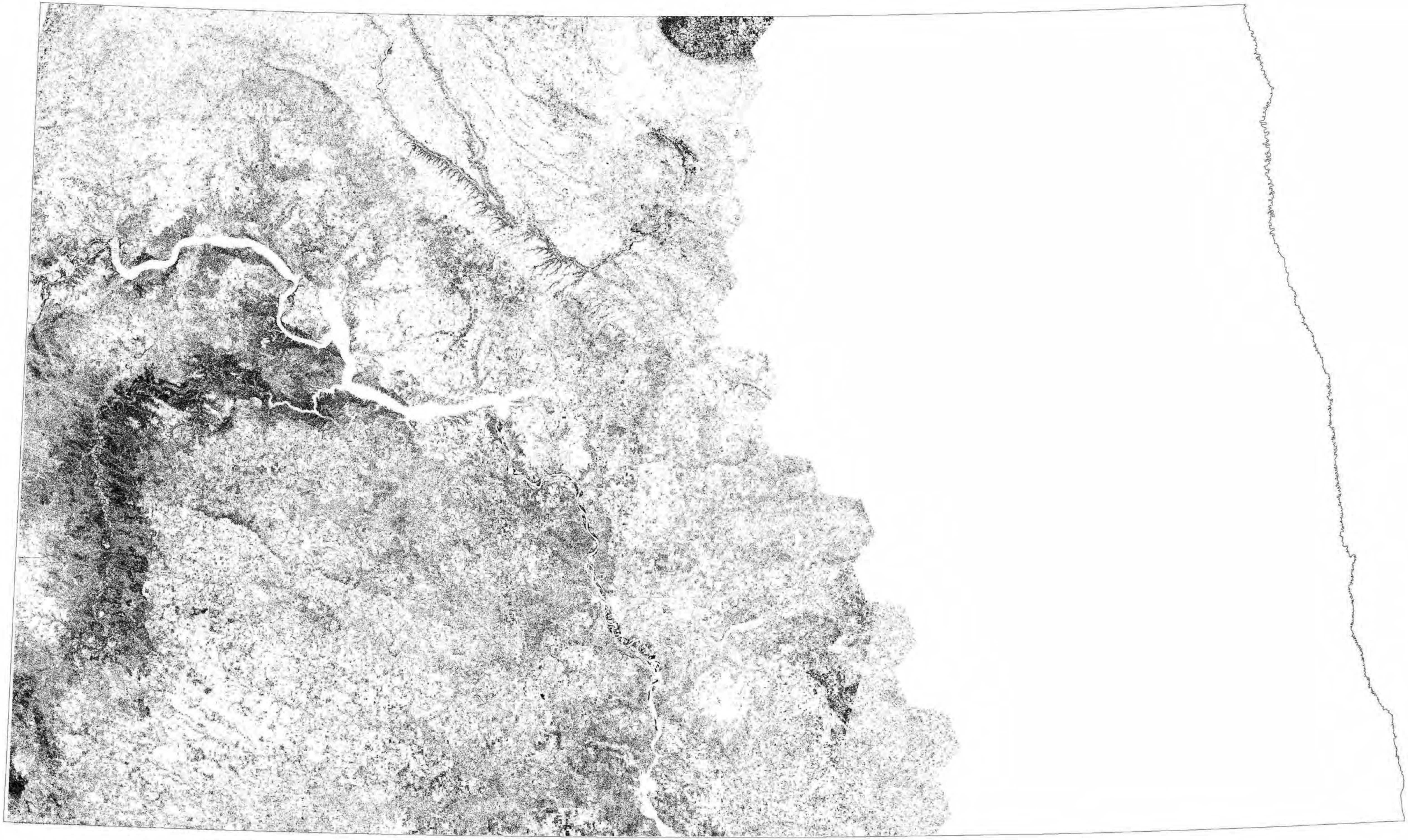


DICKCISSEL(Spiza americana)

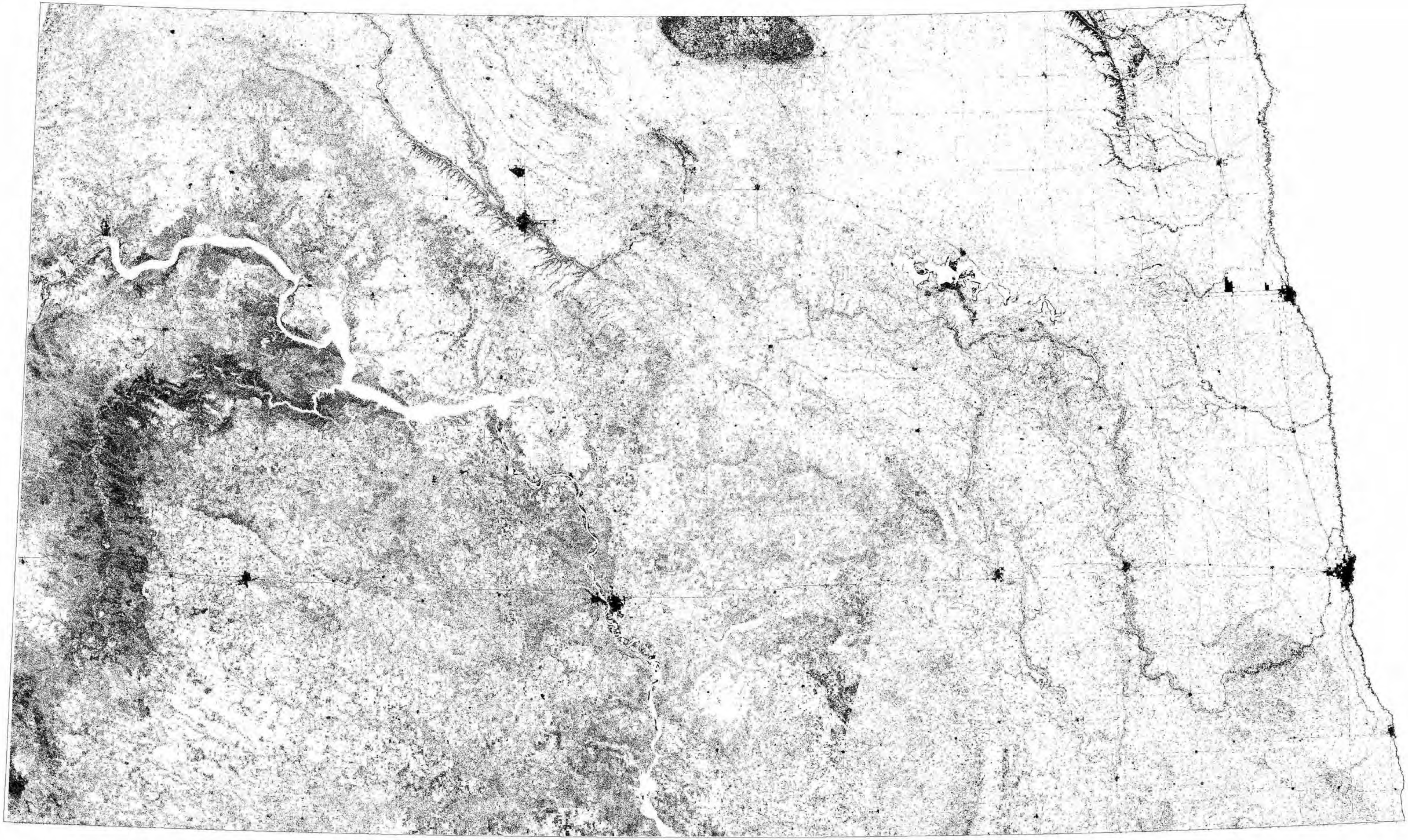


EASTERN TOWHEE(Pipilo erythrophthalmus)

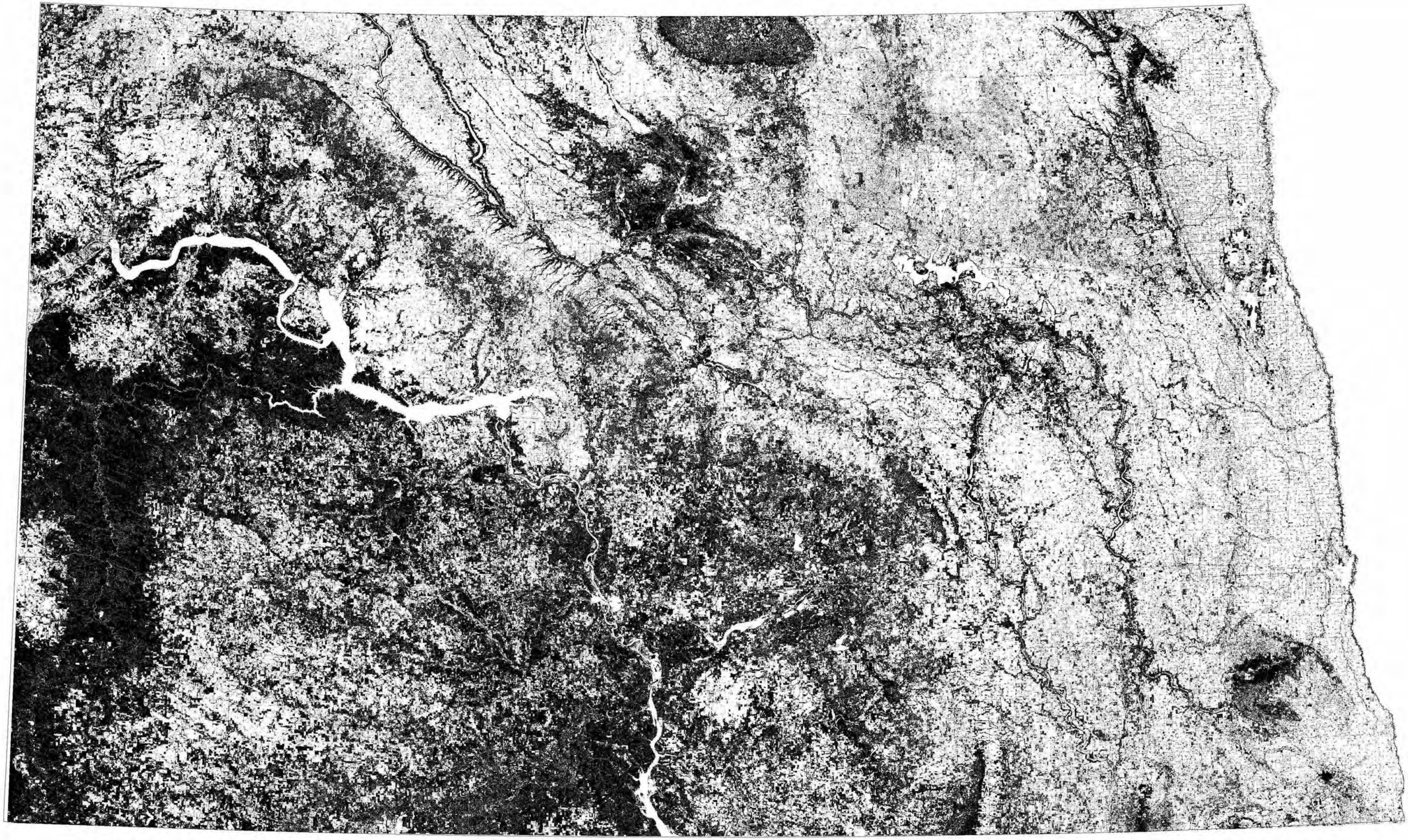
SPOTTED TOWHEE(Pipilo maculatus)



CHIPPING SPARROW(Spizella passerina)



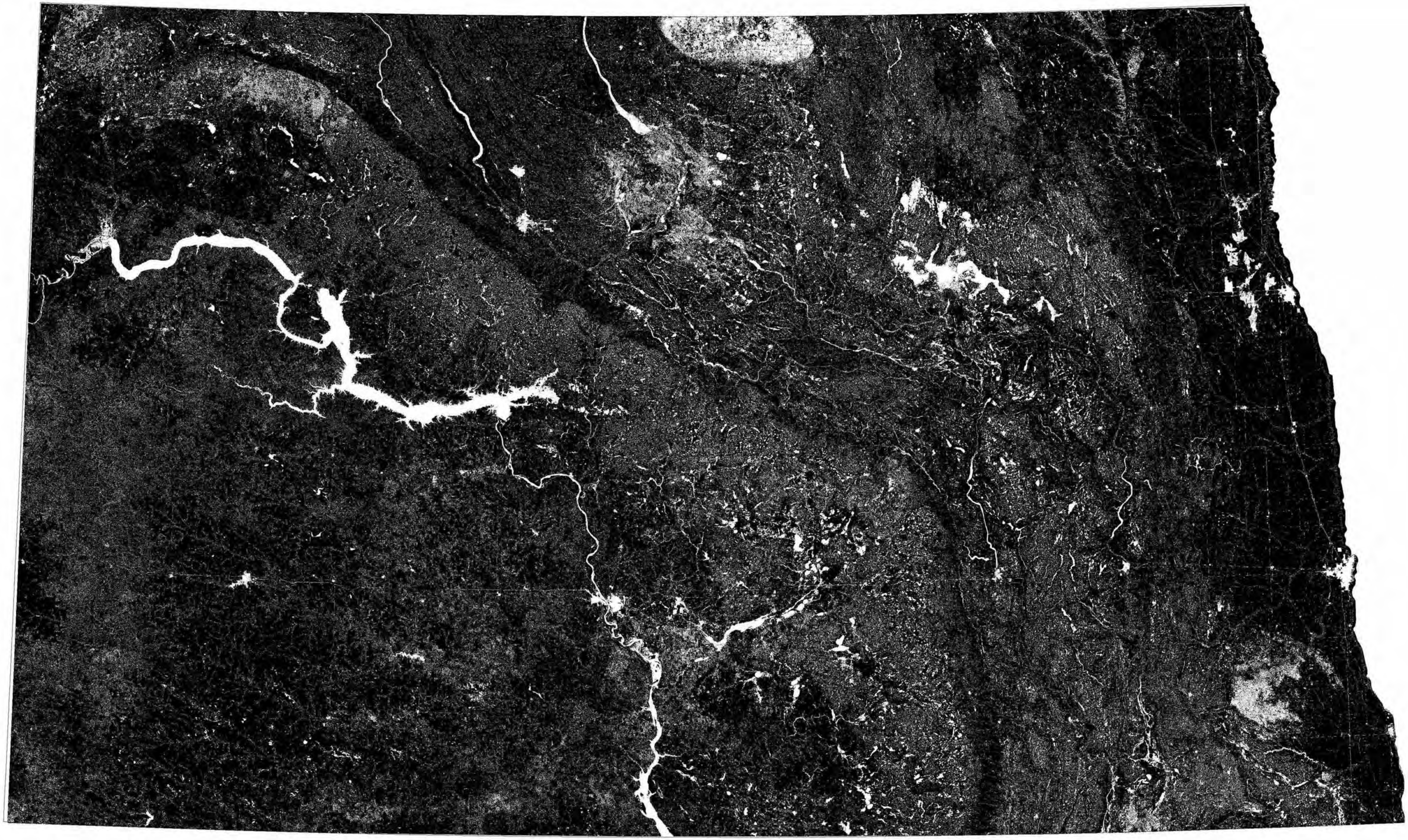
CLAY-COLORED SPARROW(Spizella pallida)



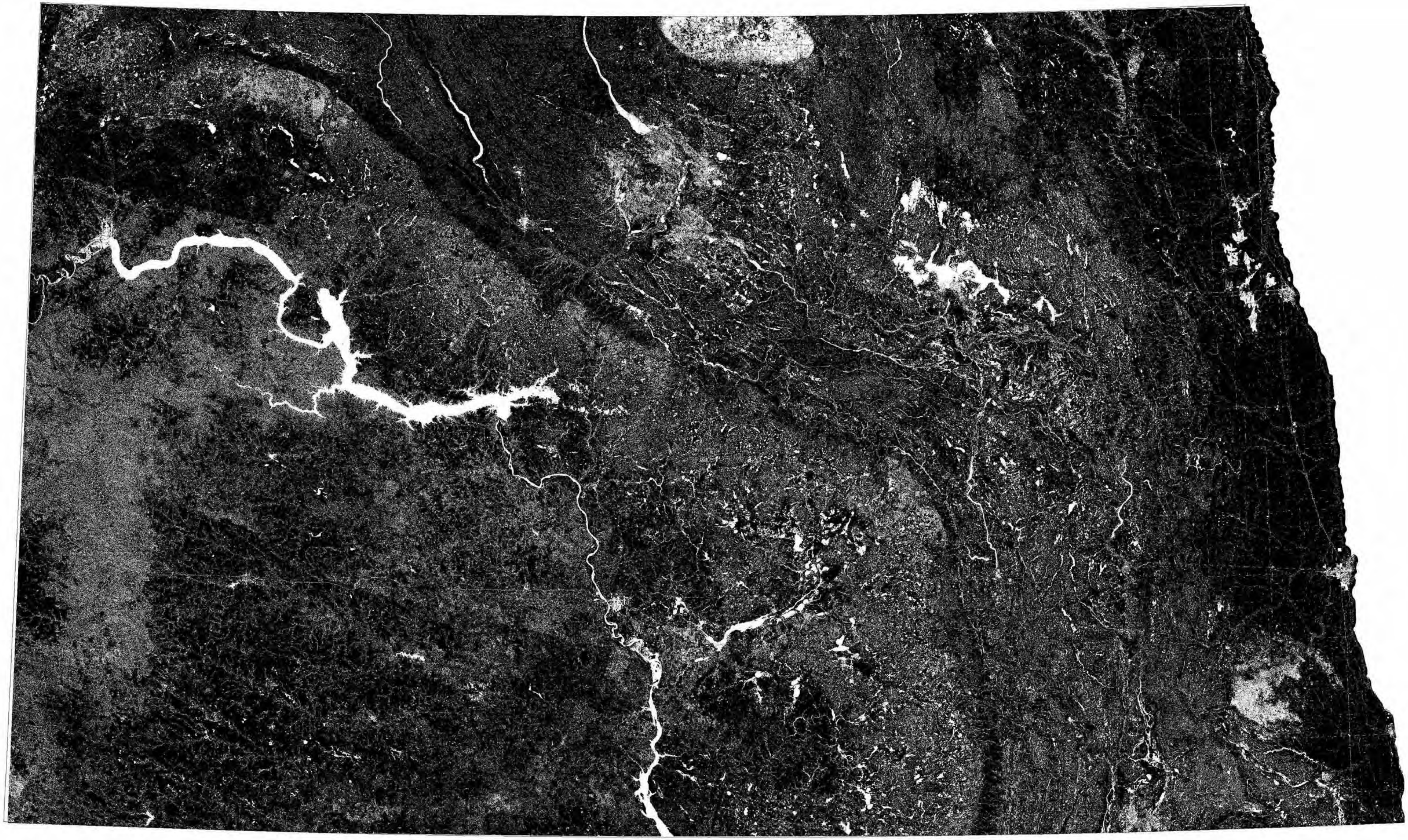
BREWER'S SPARROW(Spizella breweri)

FIELD SPARROW(Spizella pusilla)

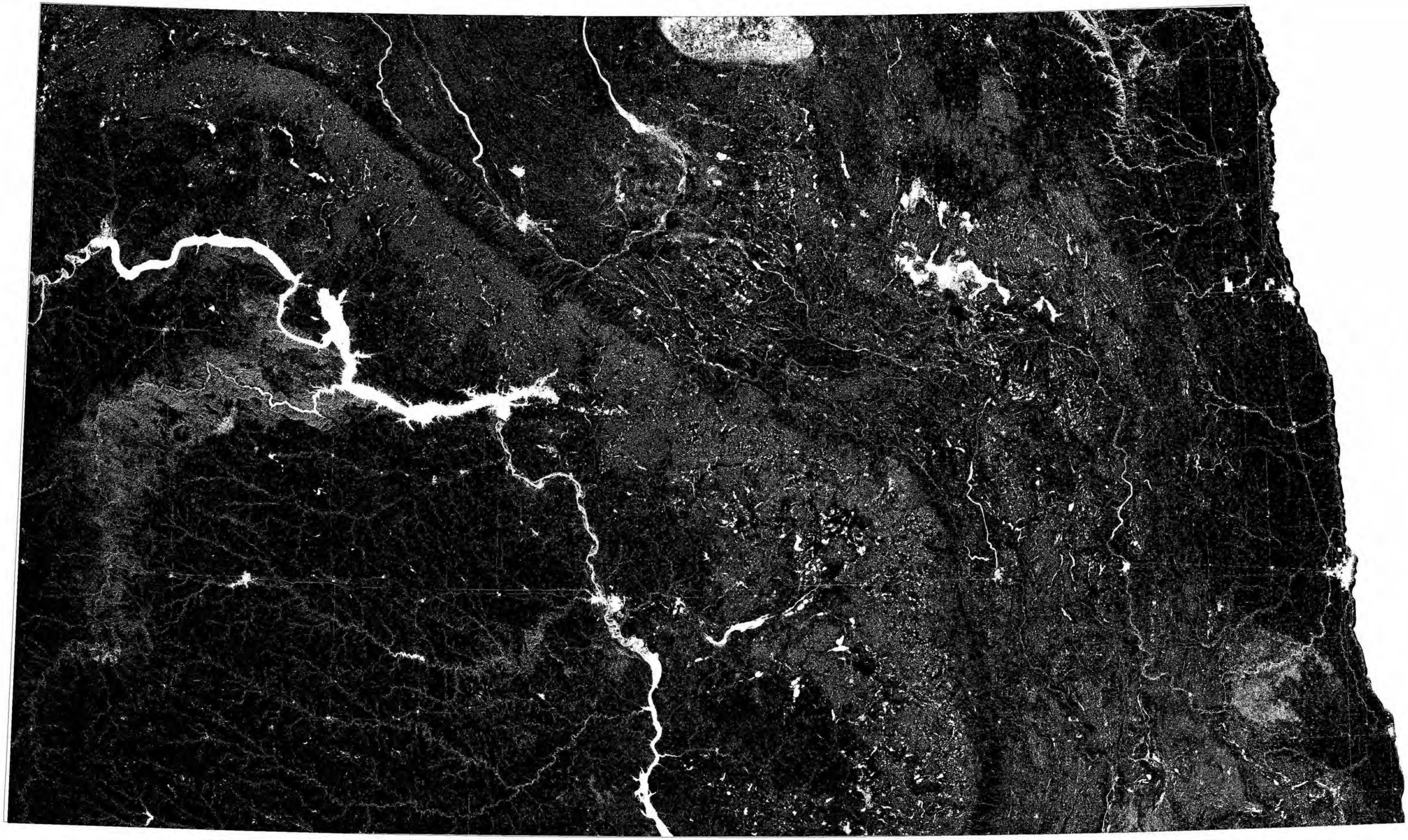
VESPER SPARROW(Pooecetes gramineus)



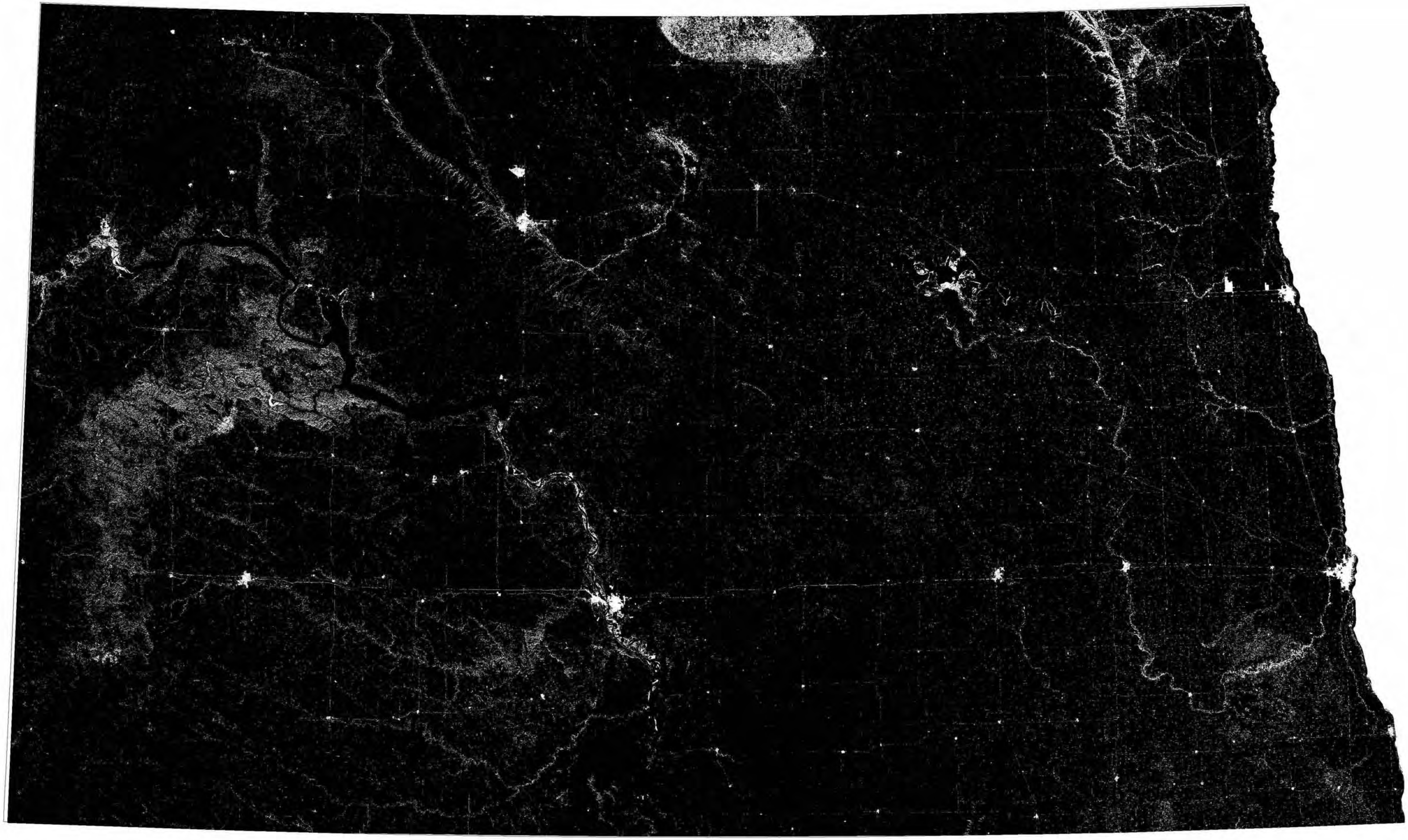
LARK SPARROW(Chondestes grammacus)



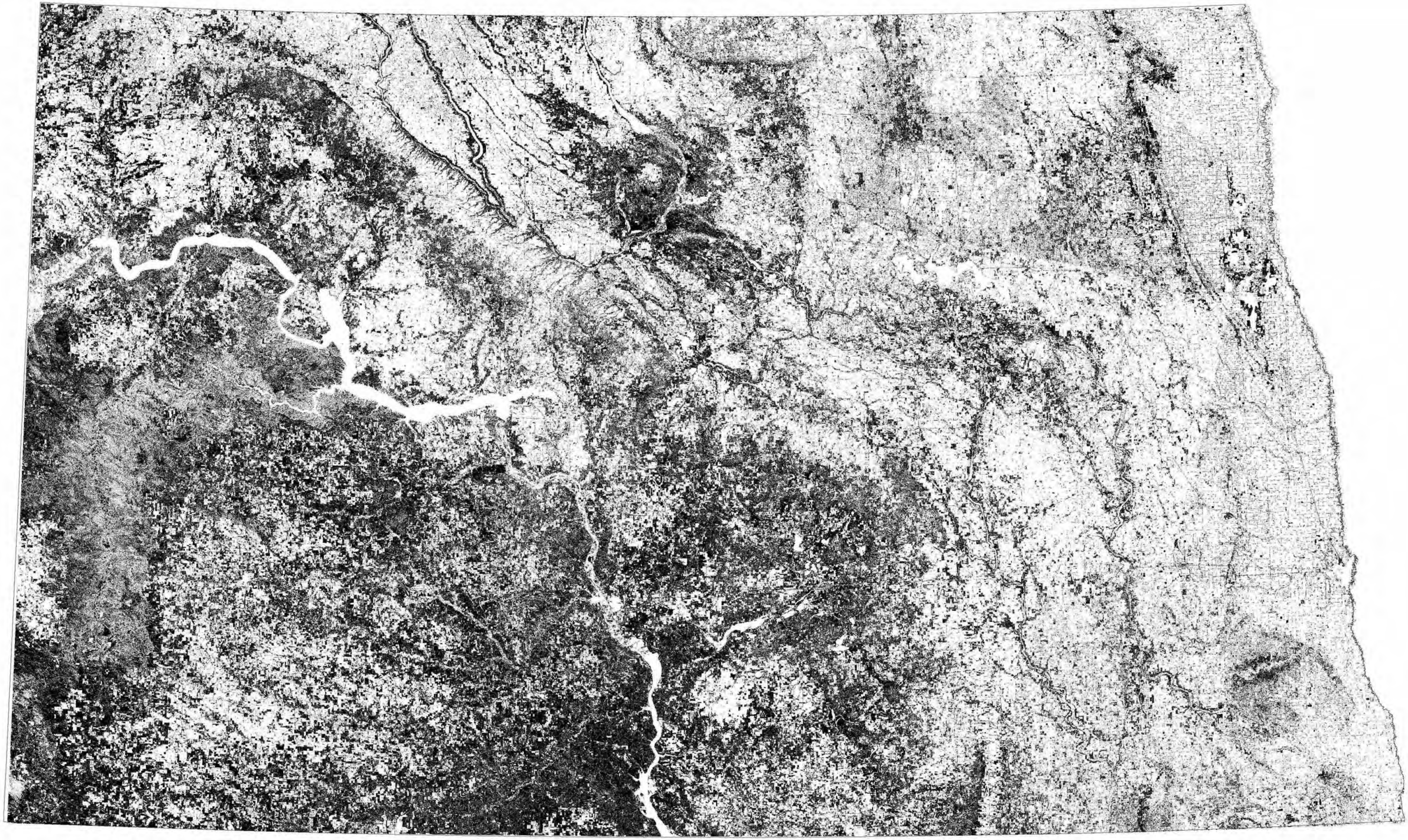
LARK BUNTING(Calamospiza melanocorys)



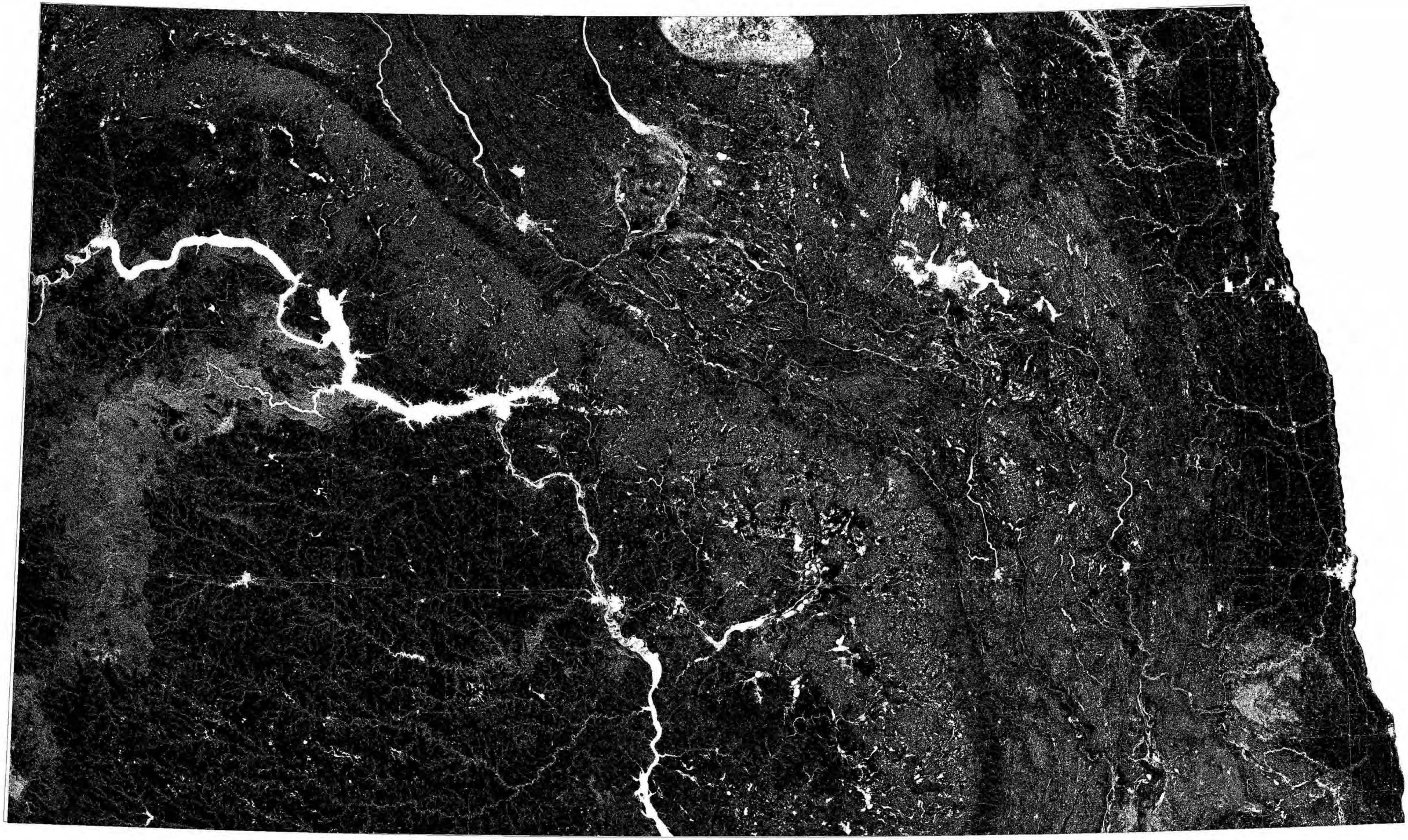
SAVANNAH SPARROW(Passerculus sandwichensis)



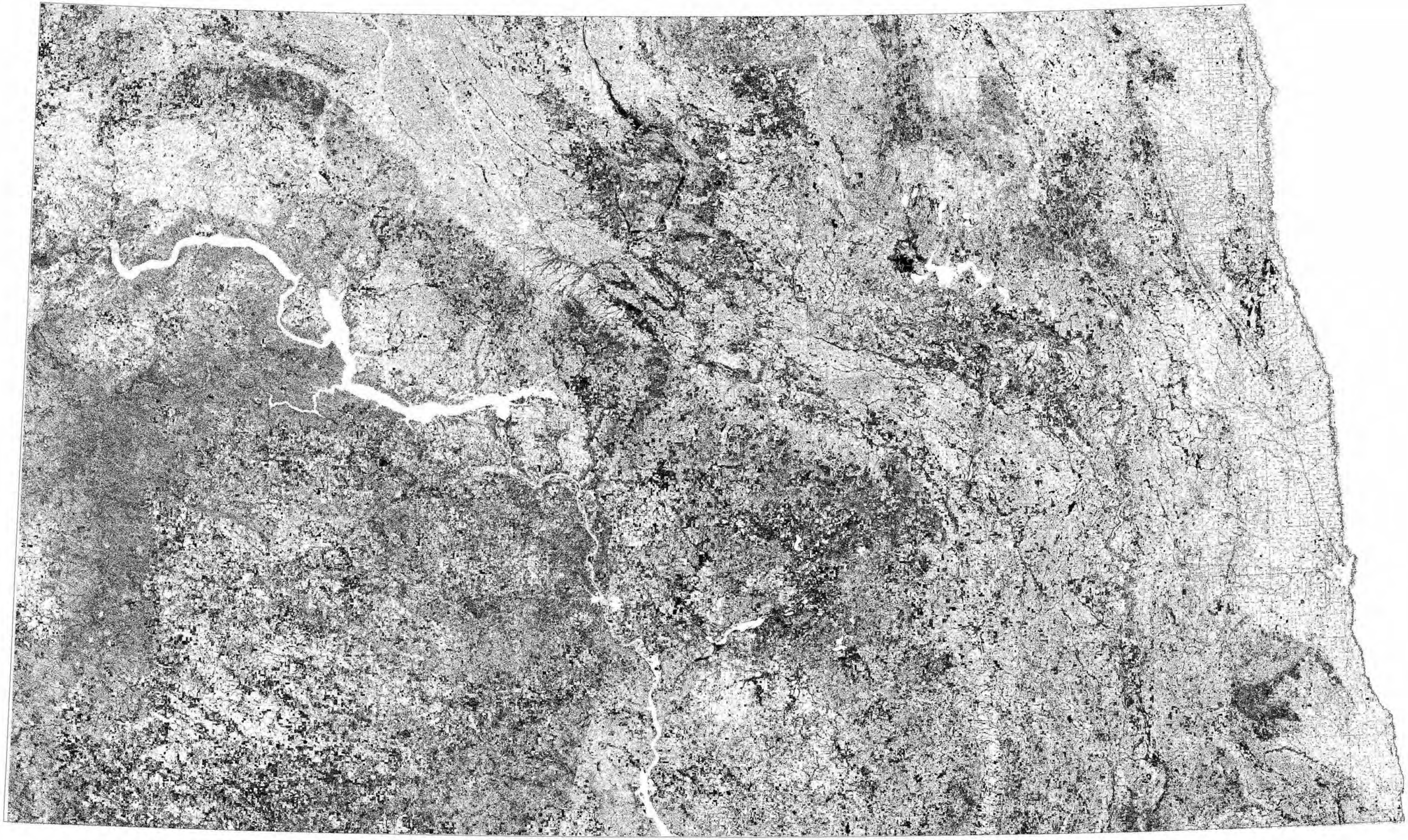
BAIRD'S SPARROW(Ammodramus bairdii)



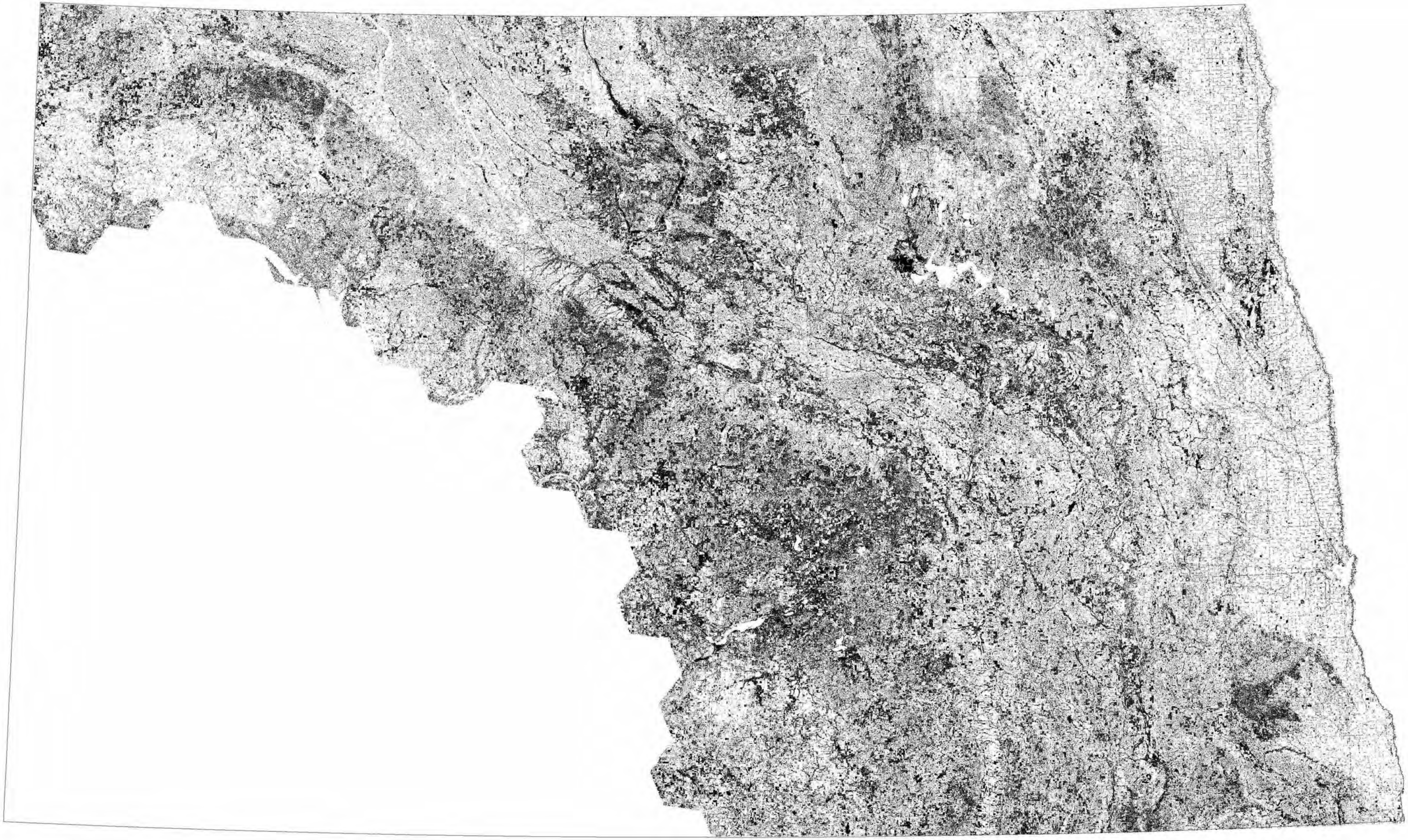
GRASSHOPPER SPARROW(Ammodramus savannarum)



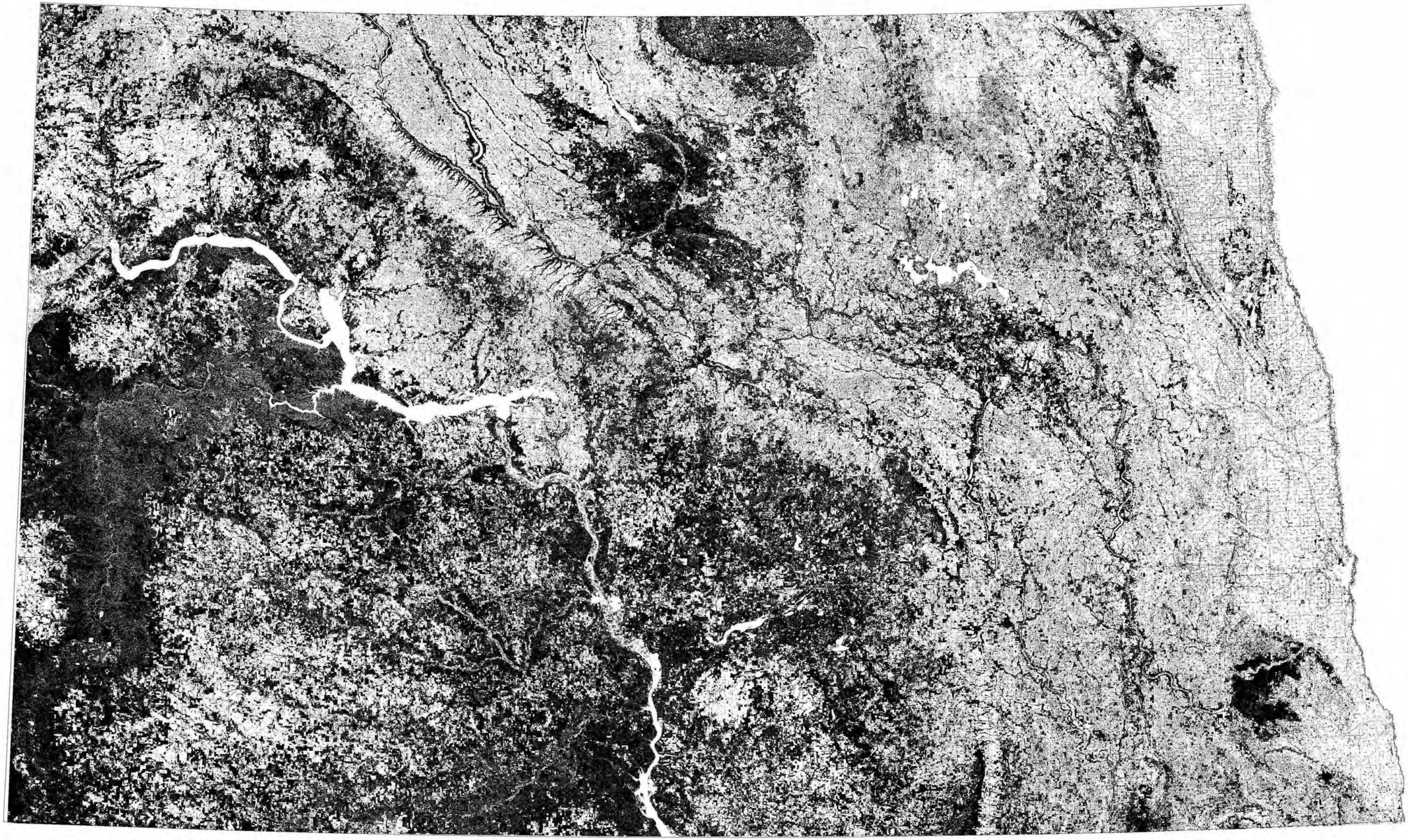
LE CONTE'S SPARROW(Ammodramus leconteii)



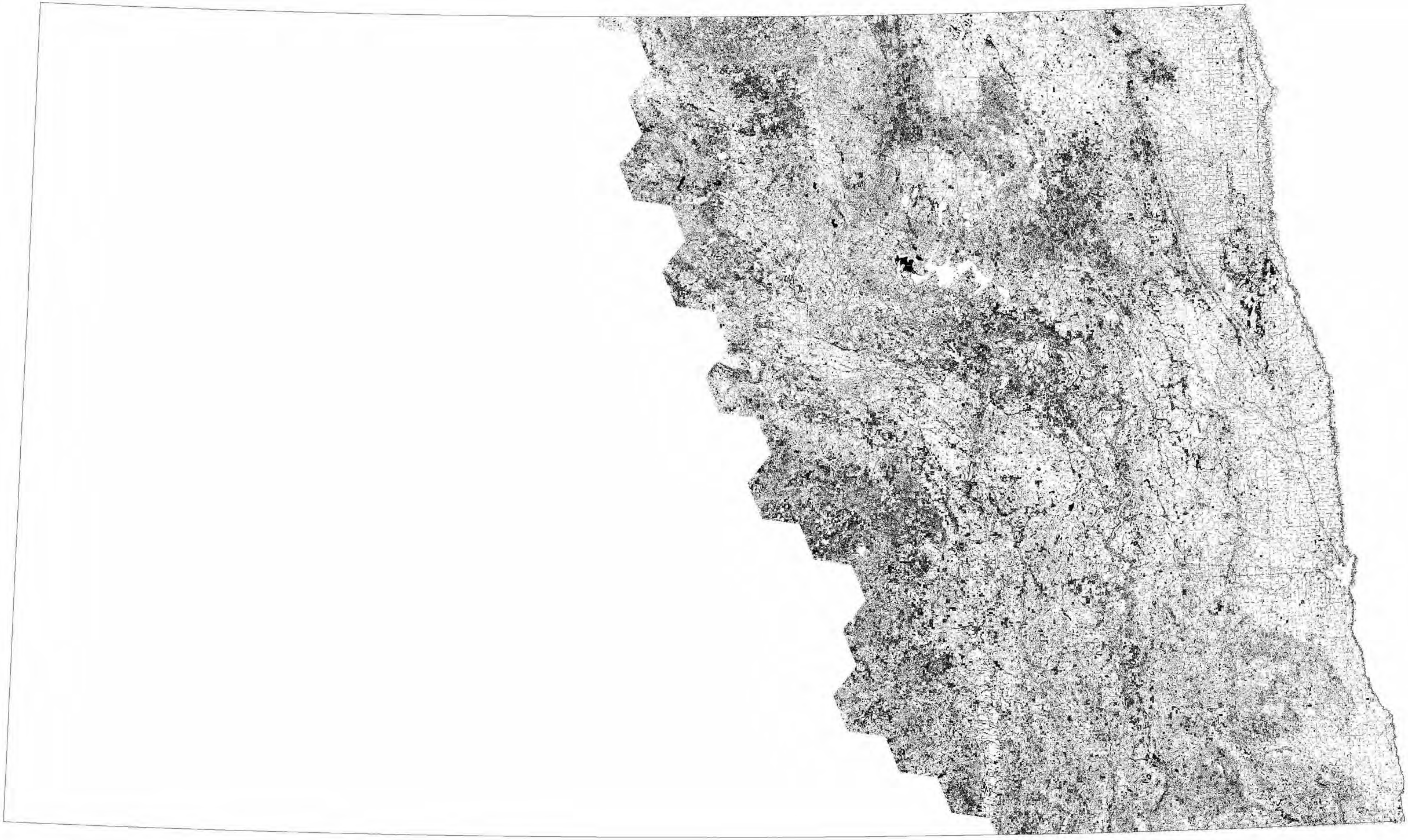
NELSON'S SHARP-TAILED SPARROW(Ammodramus nels



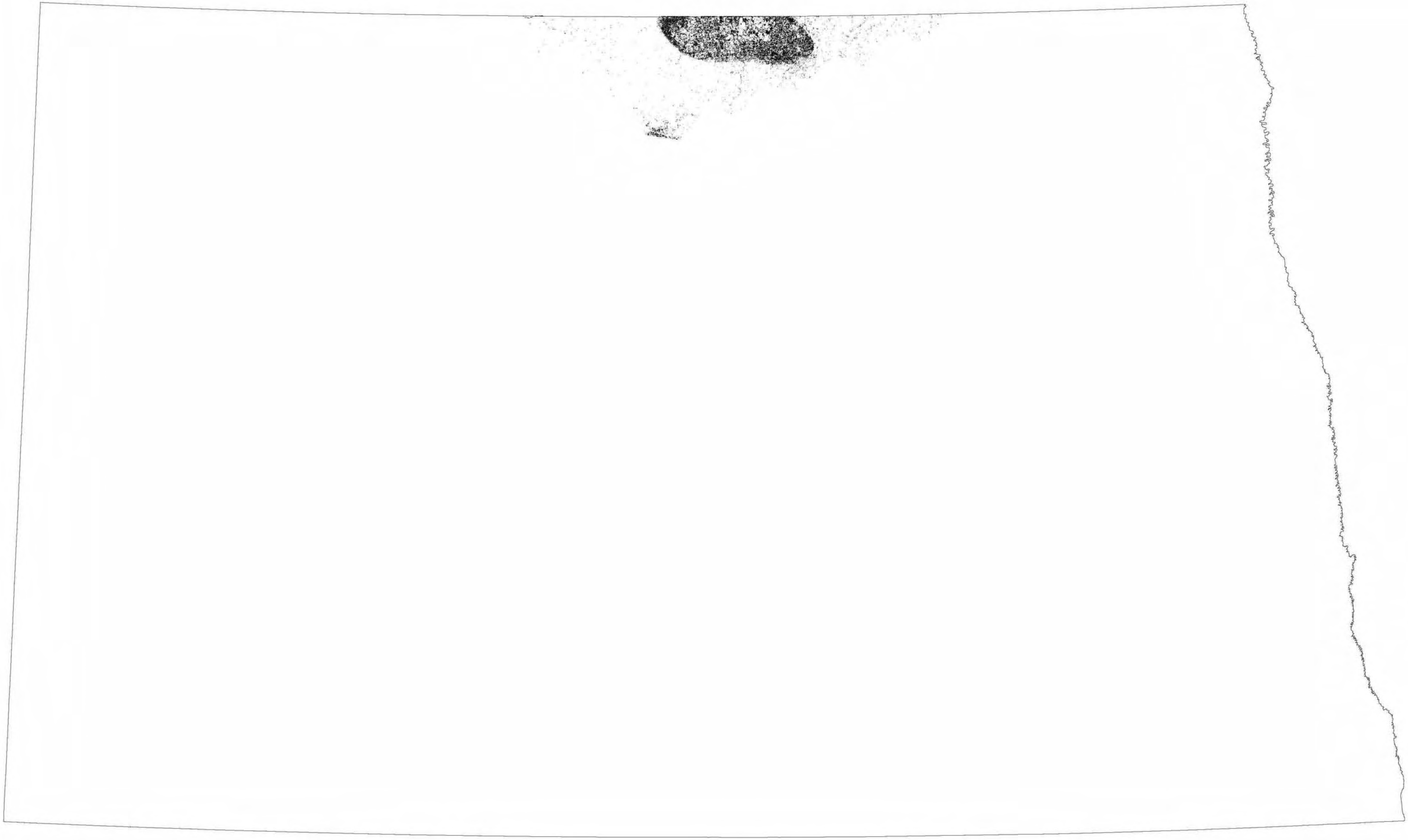
SONG SPARROW(Melospiza melodia)



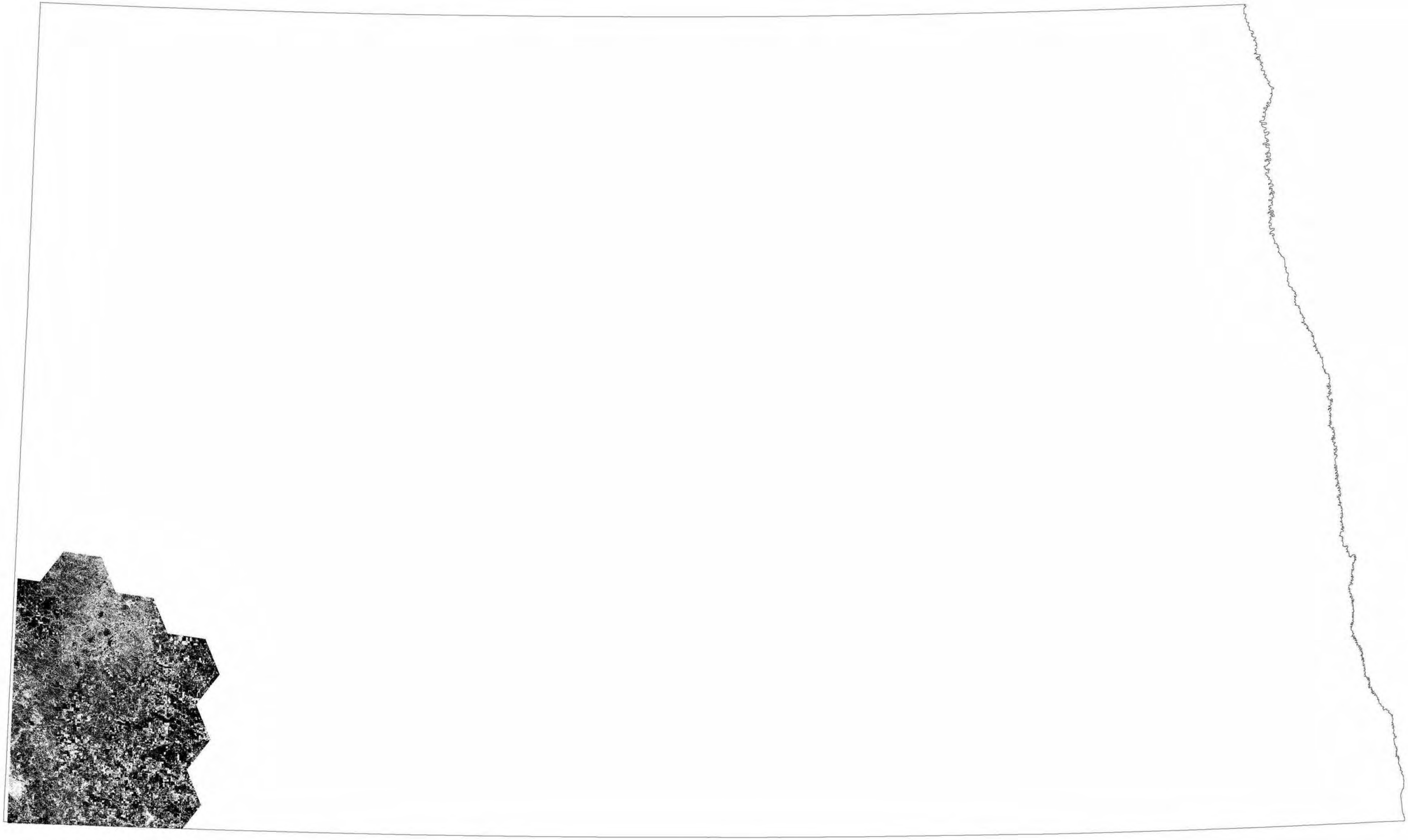
SWAMP SPARROW(Melospiza georgiana)



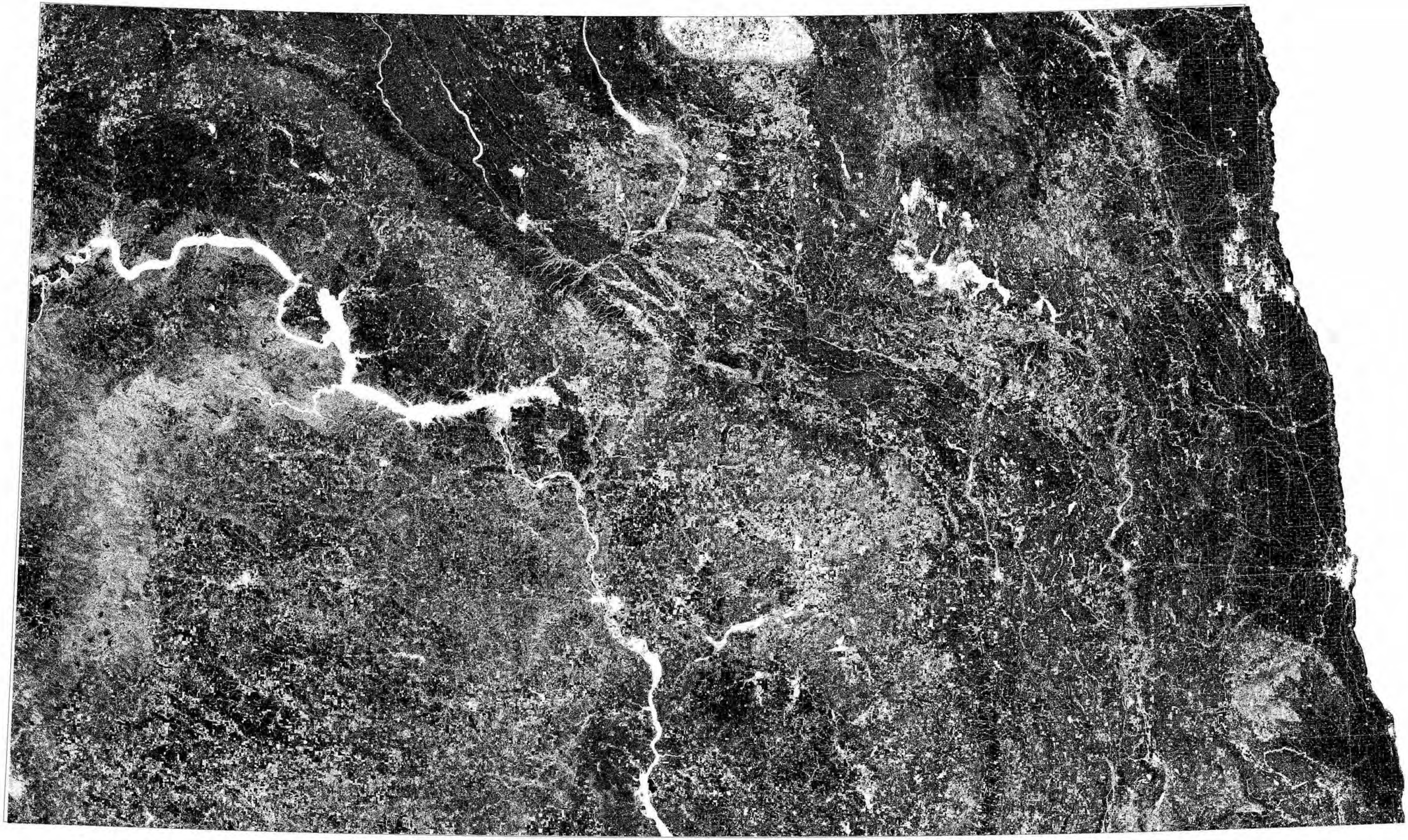
WHITE-THROATED SPARROW(Zonotrichia albicollis)



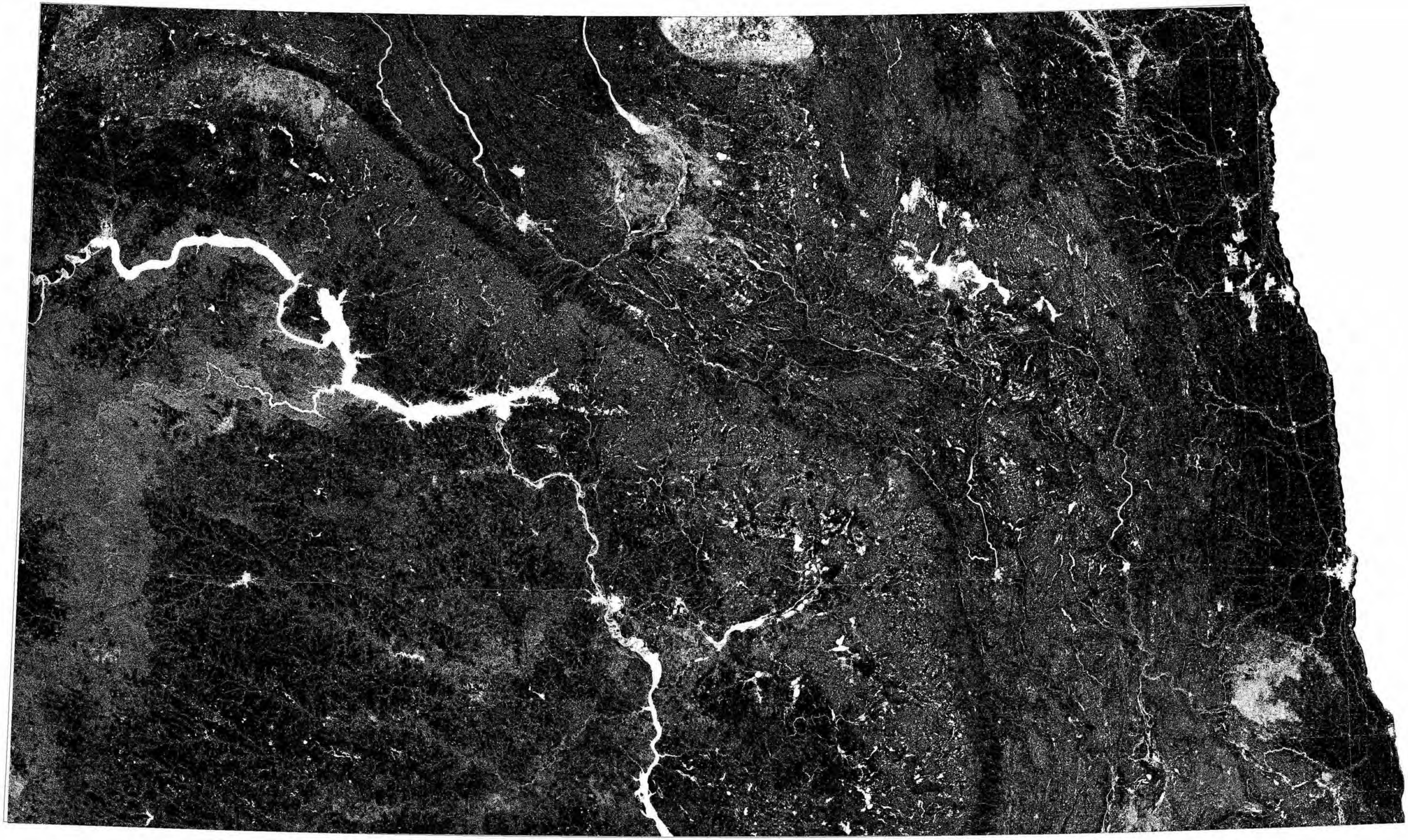
MCCOWN'S LONGSPUR(Calcarius mccownii)



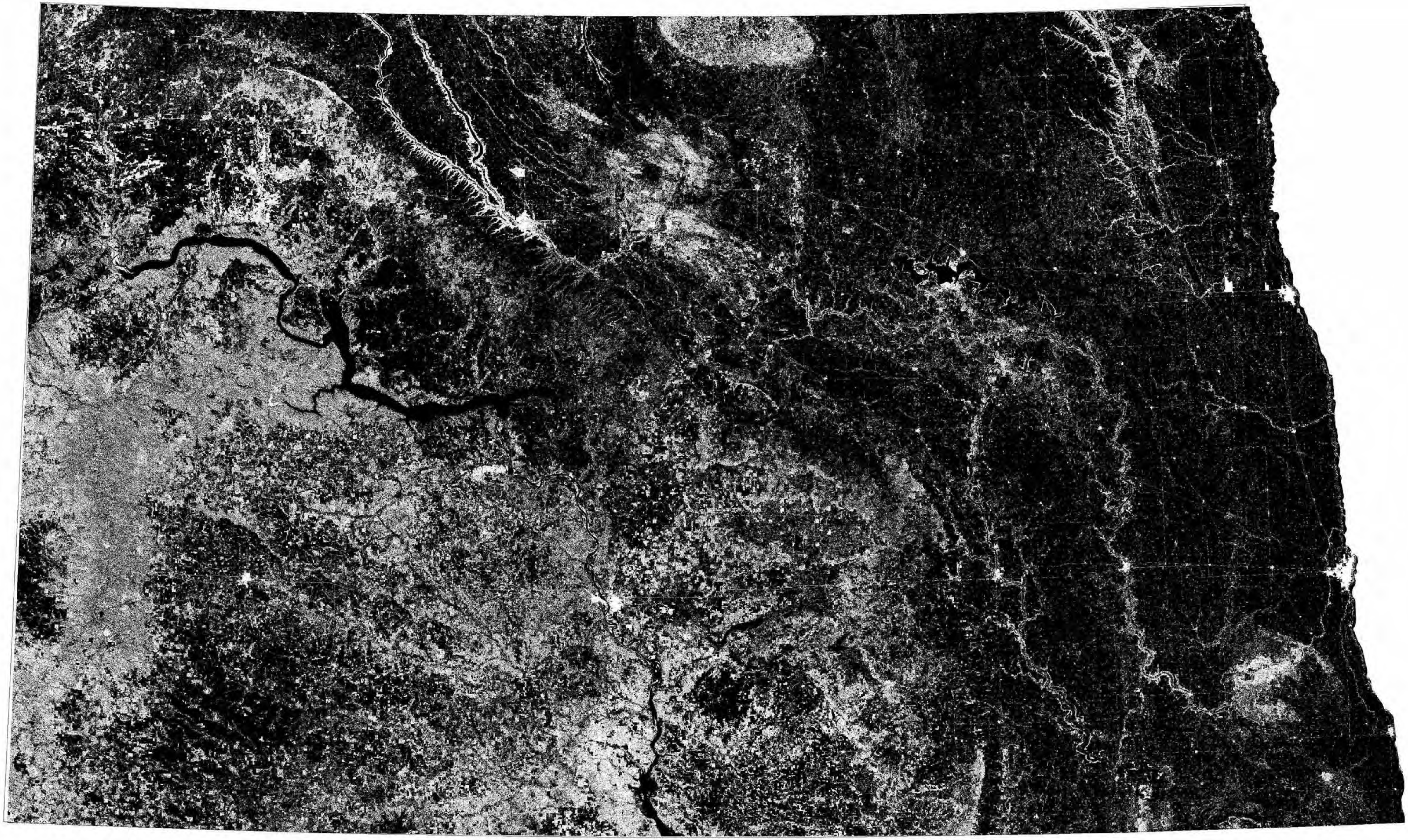
CHESTNUT-COLLARED LONGSPUR(Calcarius ornatus)



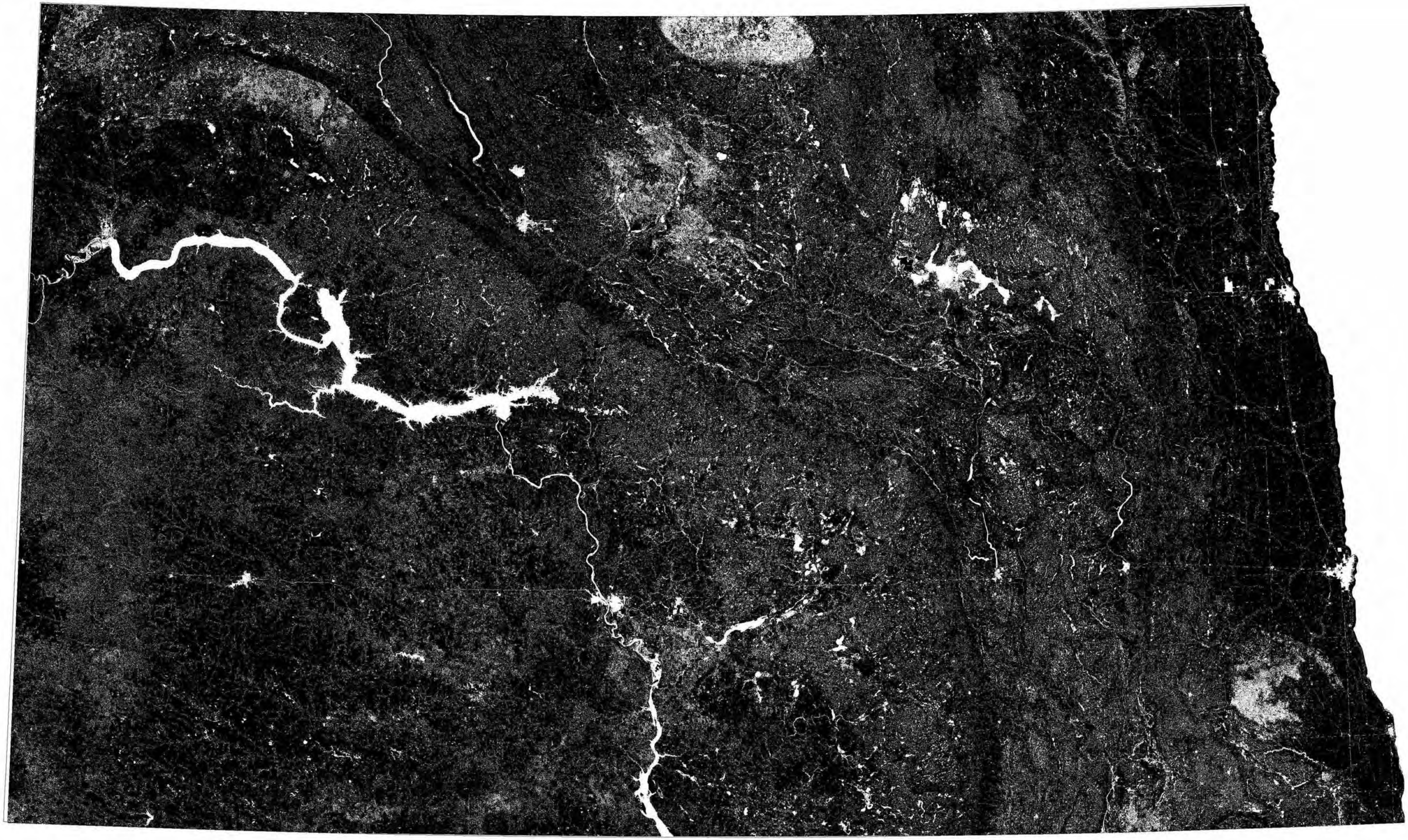
BOBOLINK(Dolichonyx oryzivorus)



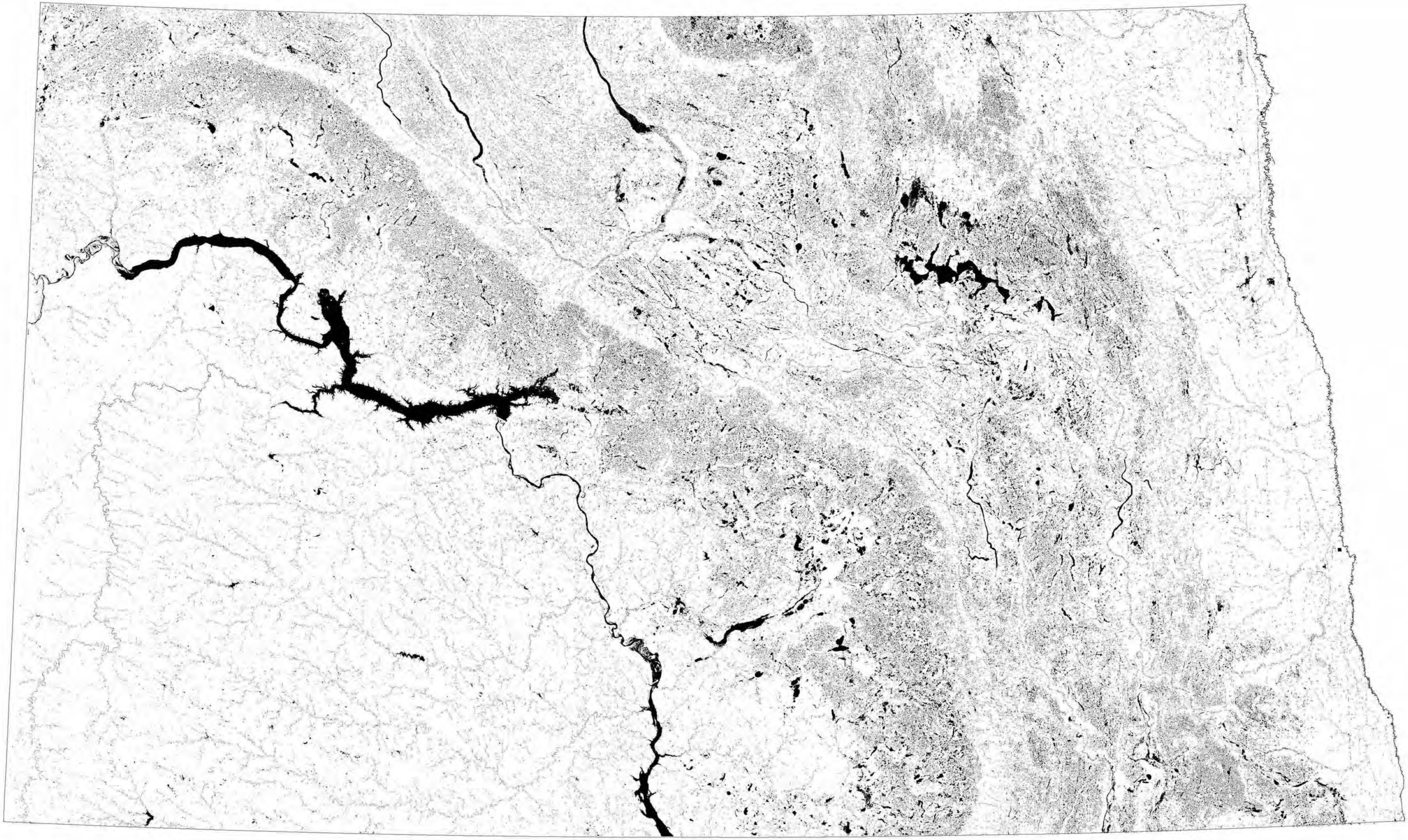
RED-WINGED BLACKBIRD(Agelaius phoeniceus)



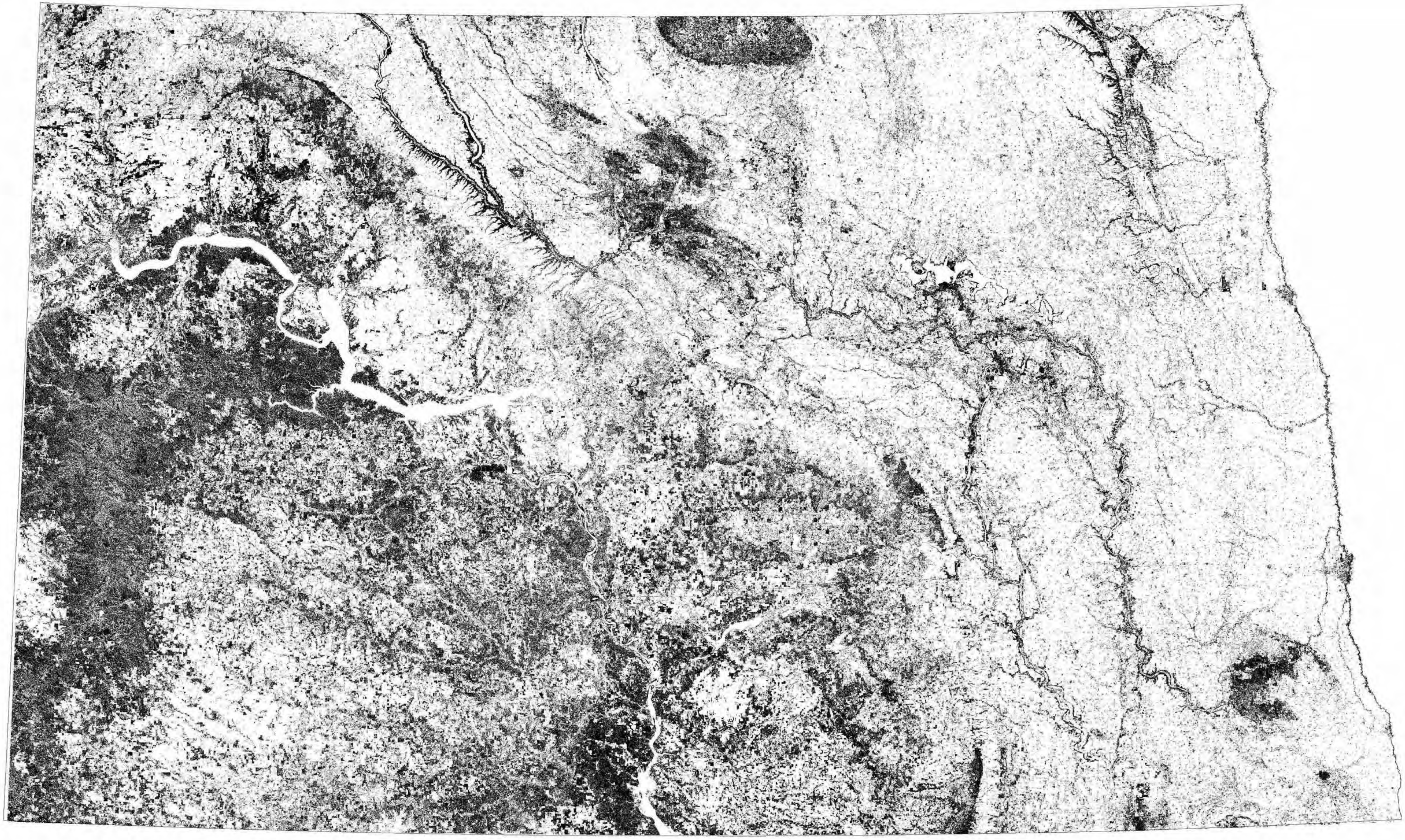
WESTERN MEADOWLARK(Sturnella neglecta)



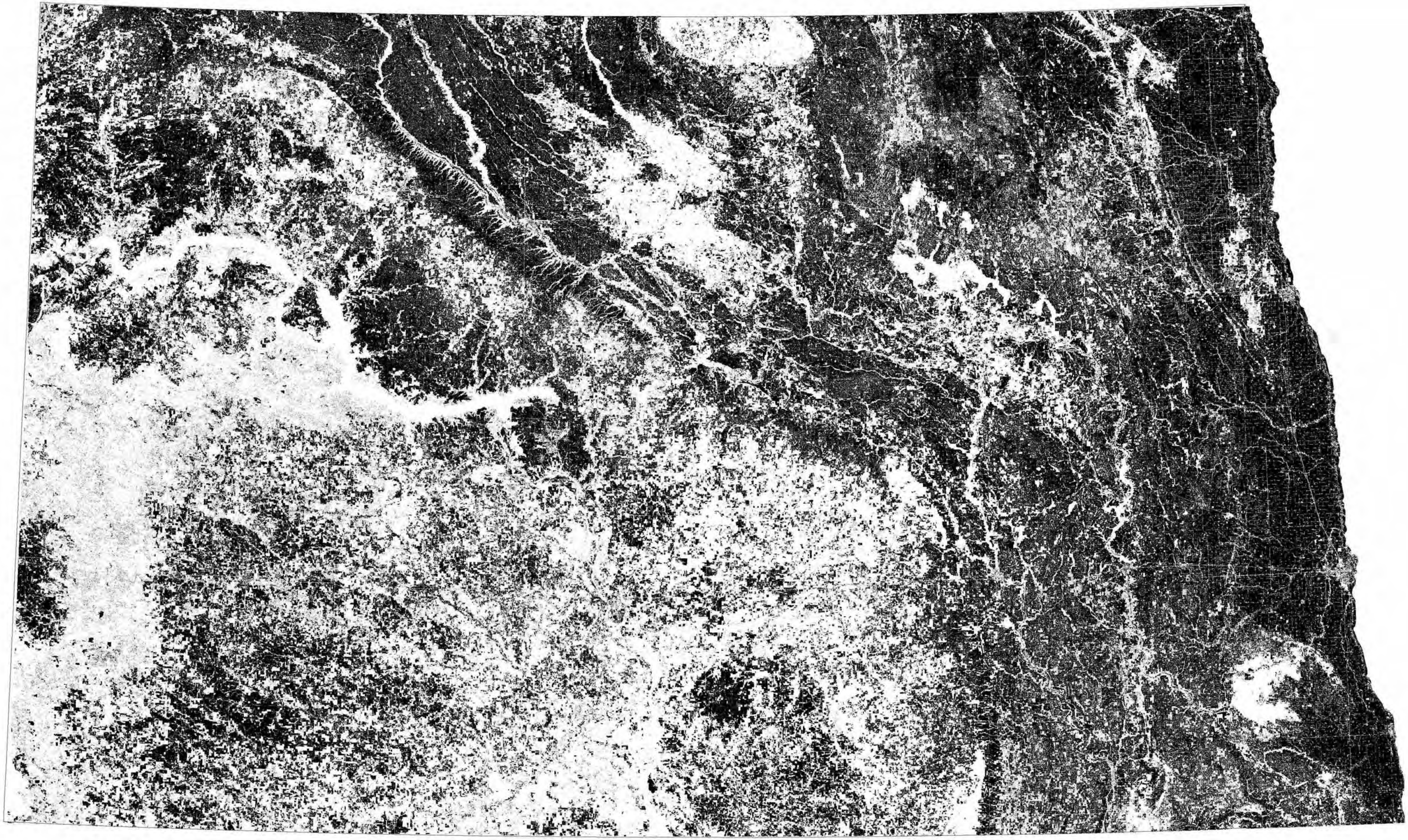
YELLOW-HEADED BLACKBIRD(Xanthocephalus xanthoce



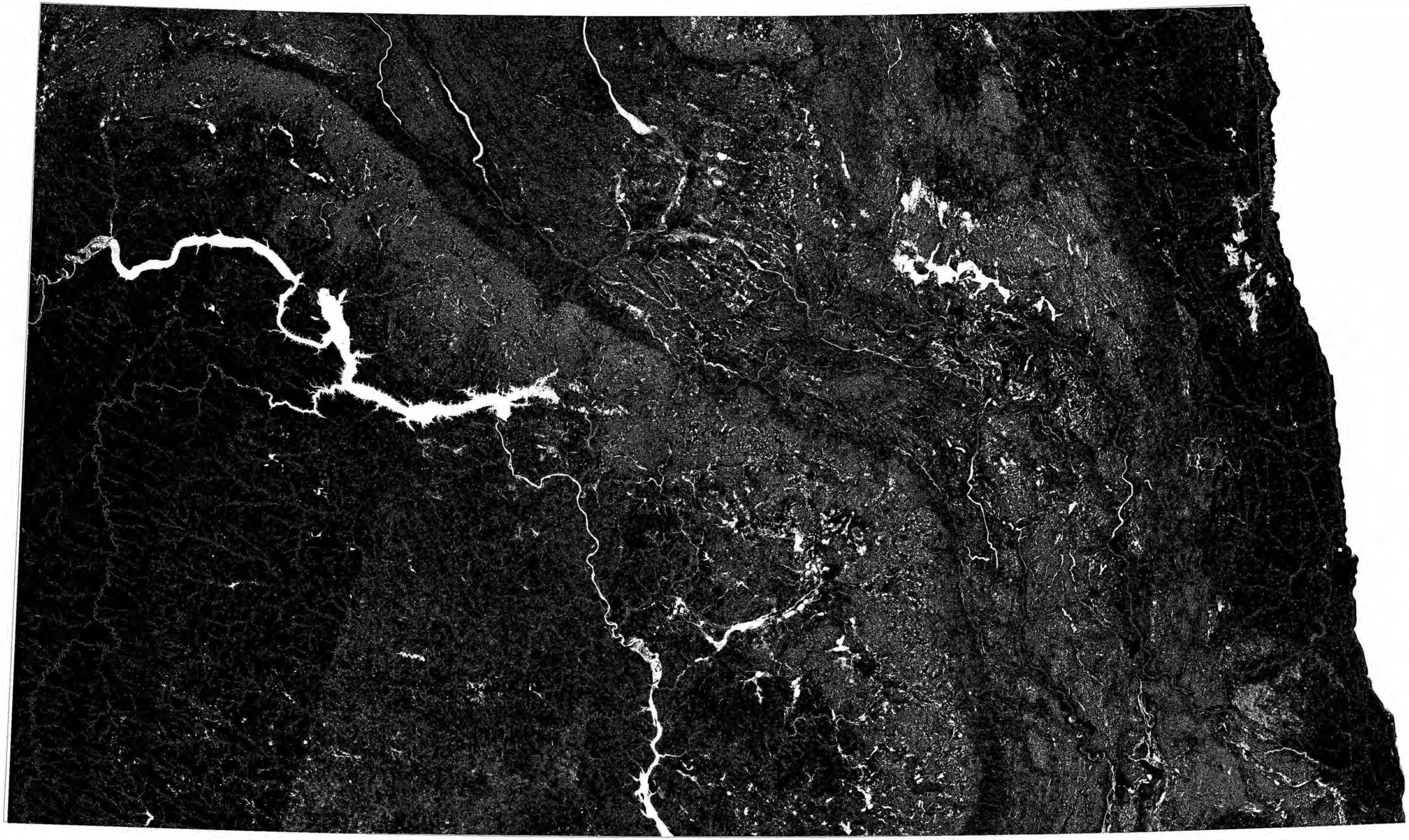
BREWER'S BLACKBIRD(Euphagus cyanocephalus)



COMMON GRACKLE(Quiscalus quiscula)

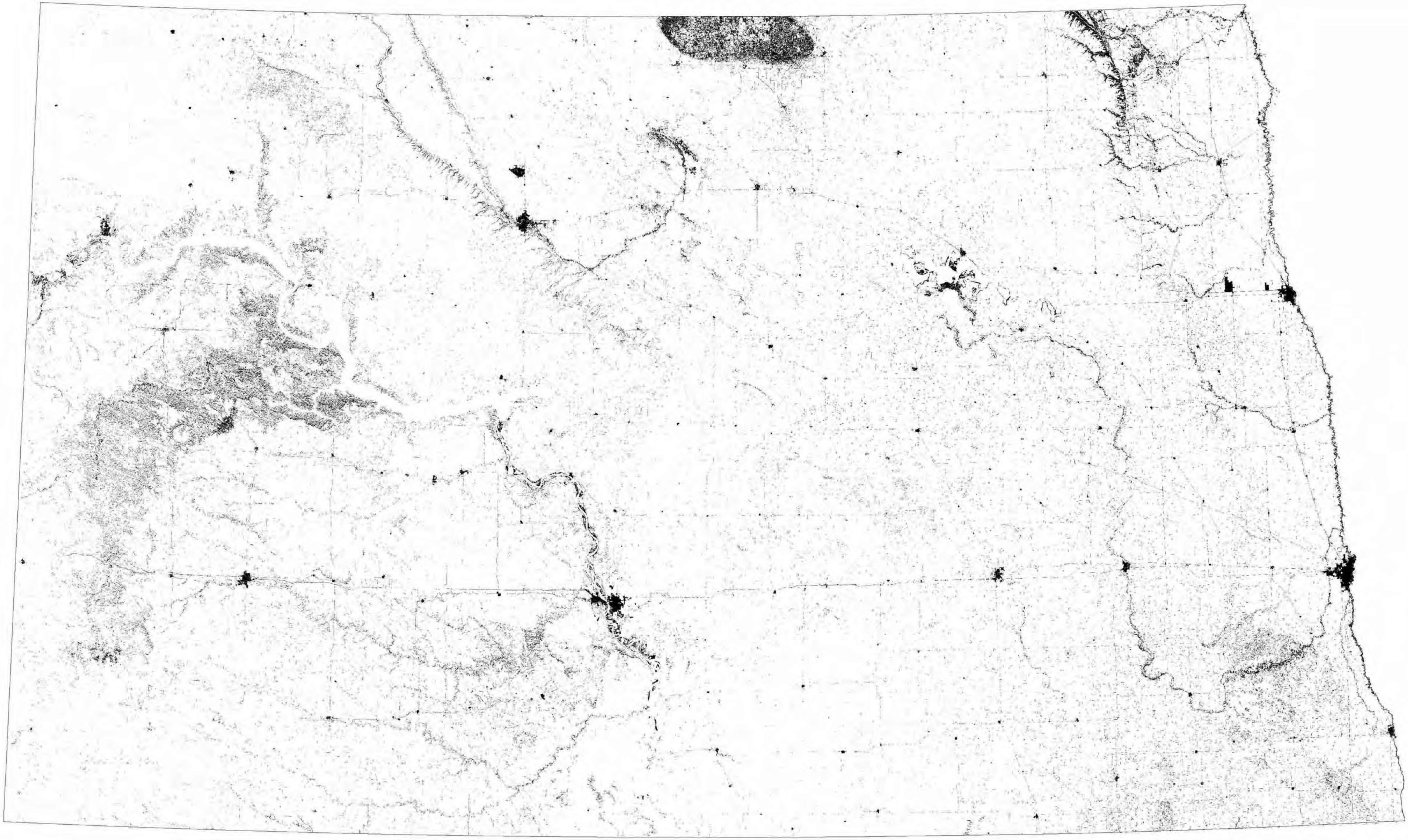


BROWN-HEADED COWBIRD(Molothrus ater)



ORCHARD ORIOLE(Icterus spurius)

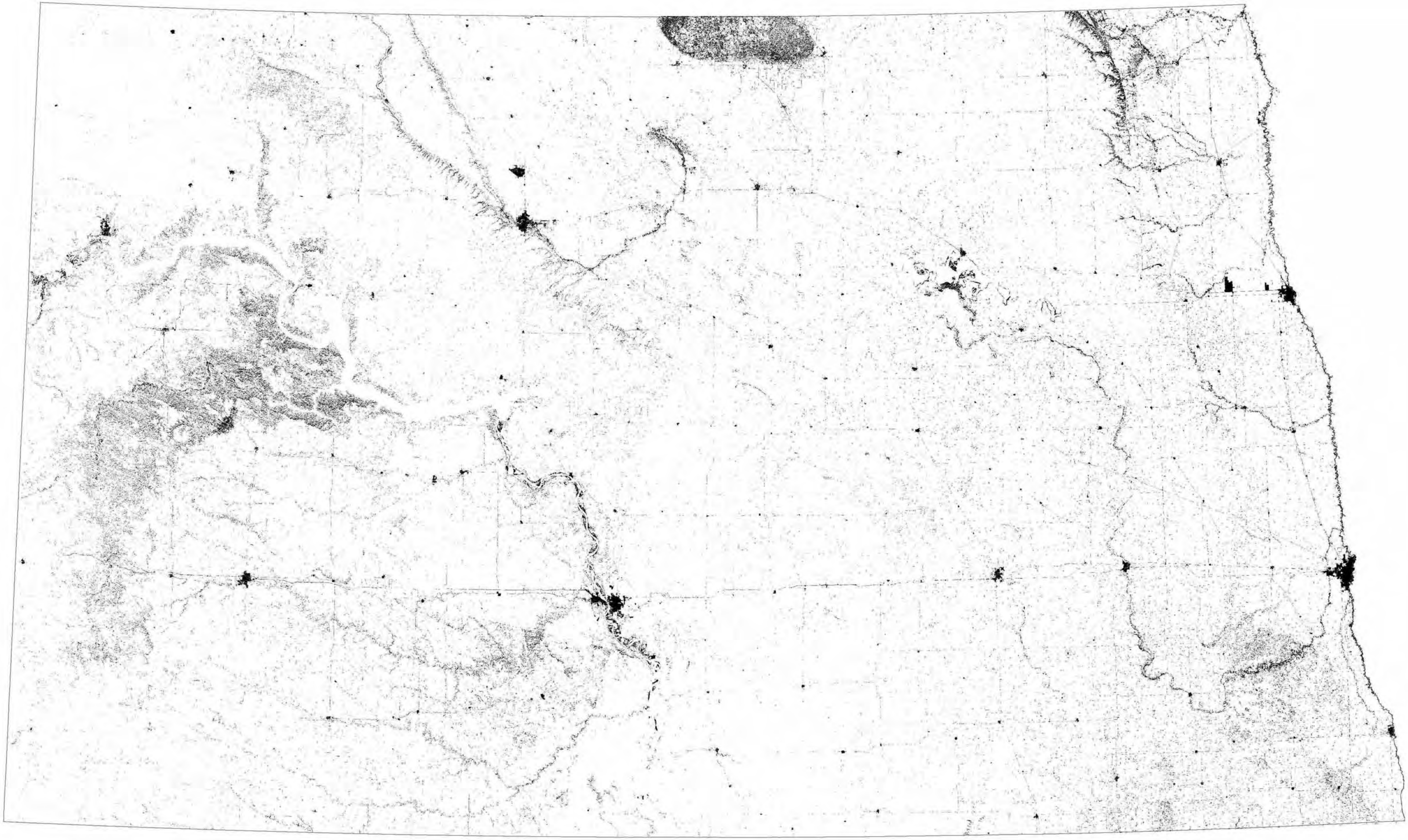
BALTIMORE ORIOLE(Icterus galbula)



BULLOCK'S ORIOLE(Icterus bullockii)

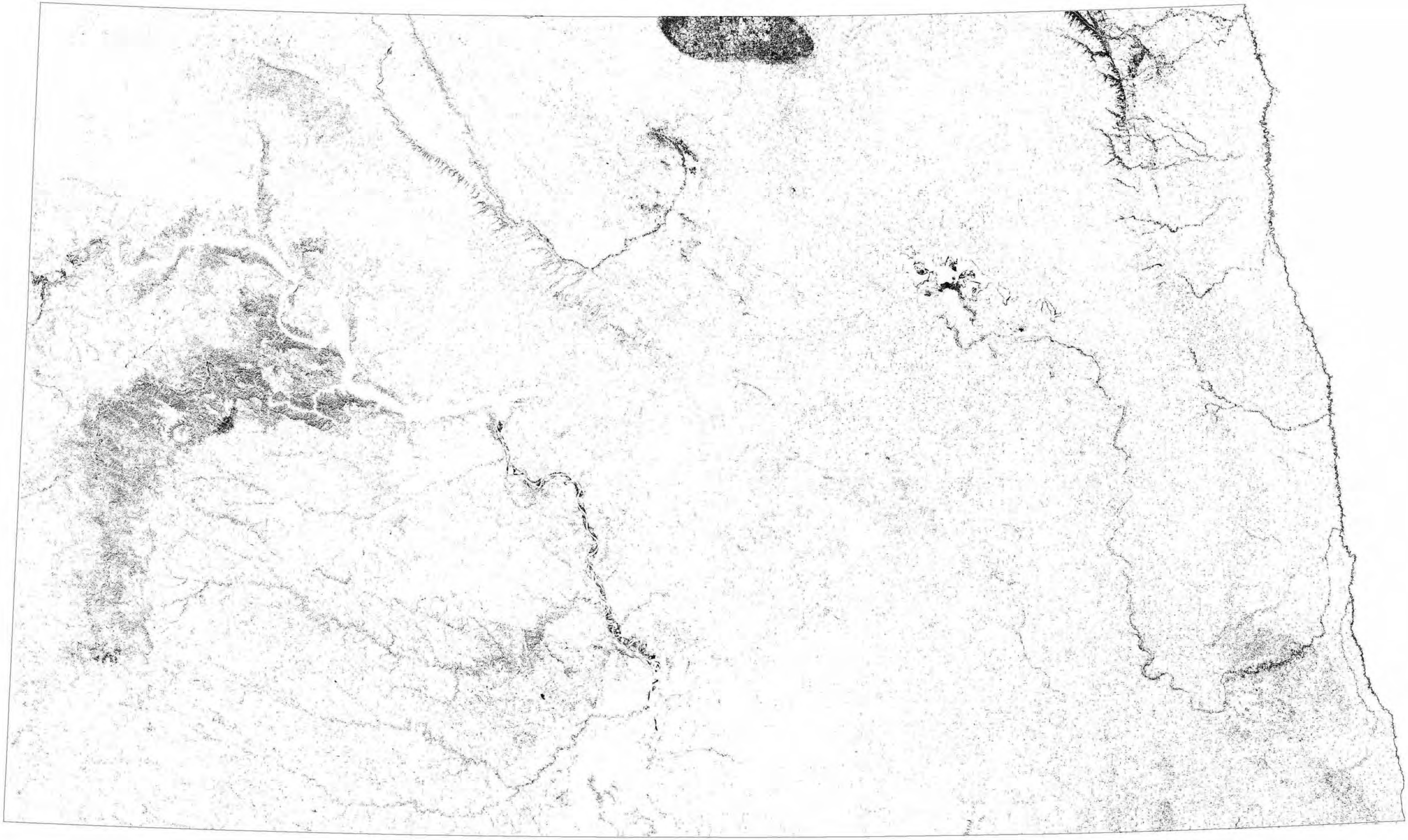
PURPLE FINCH(Carpodacus purpureus)

HOUSE FINCH(Carpodacus mexicanus)



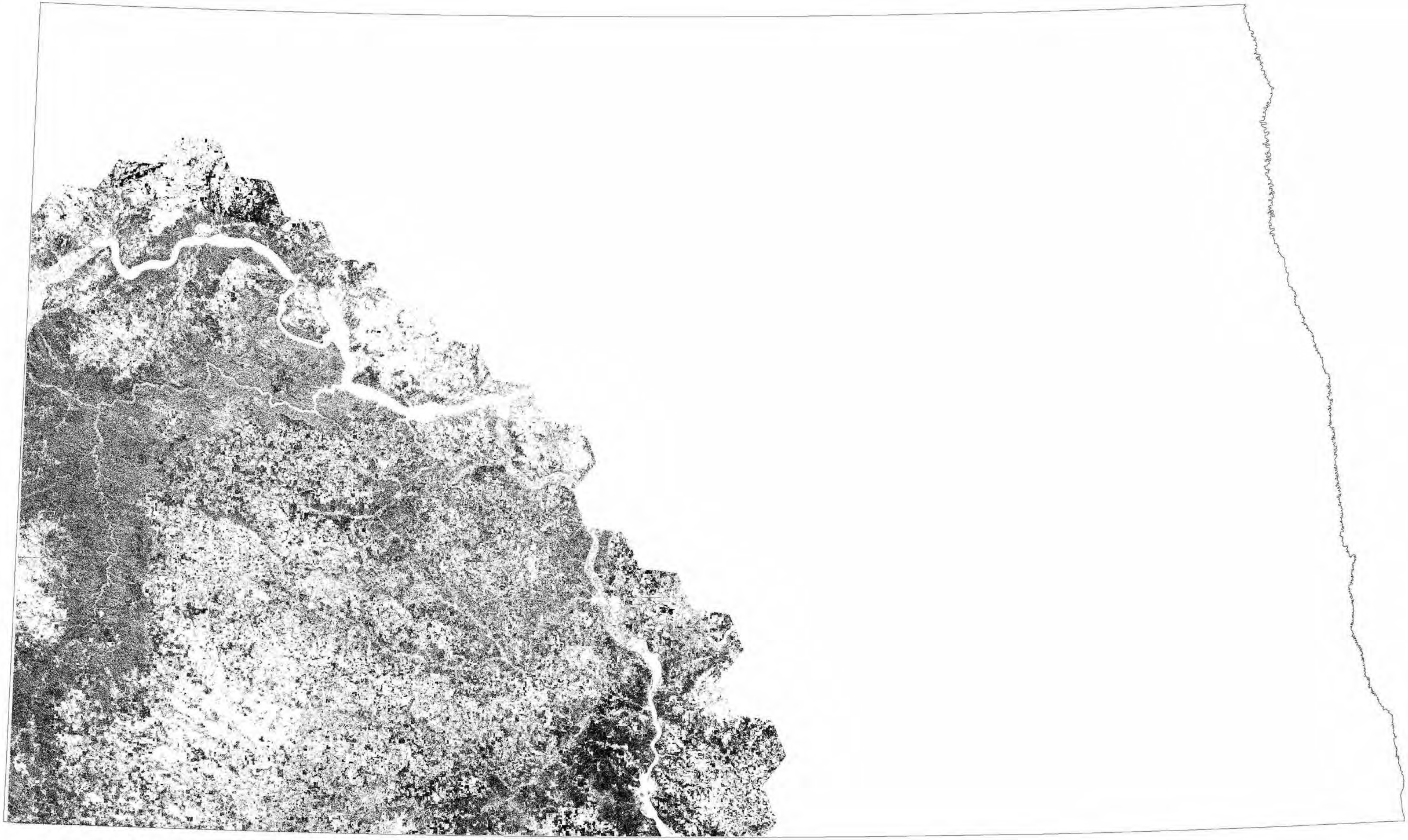
RED CROSSBILL(Loxia curvirostra)

PINE SISKIN(Carduelis pinus)

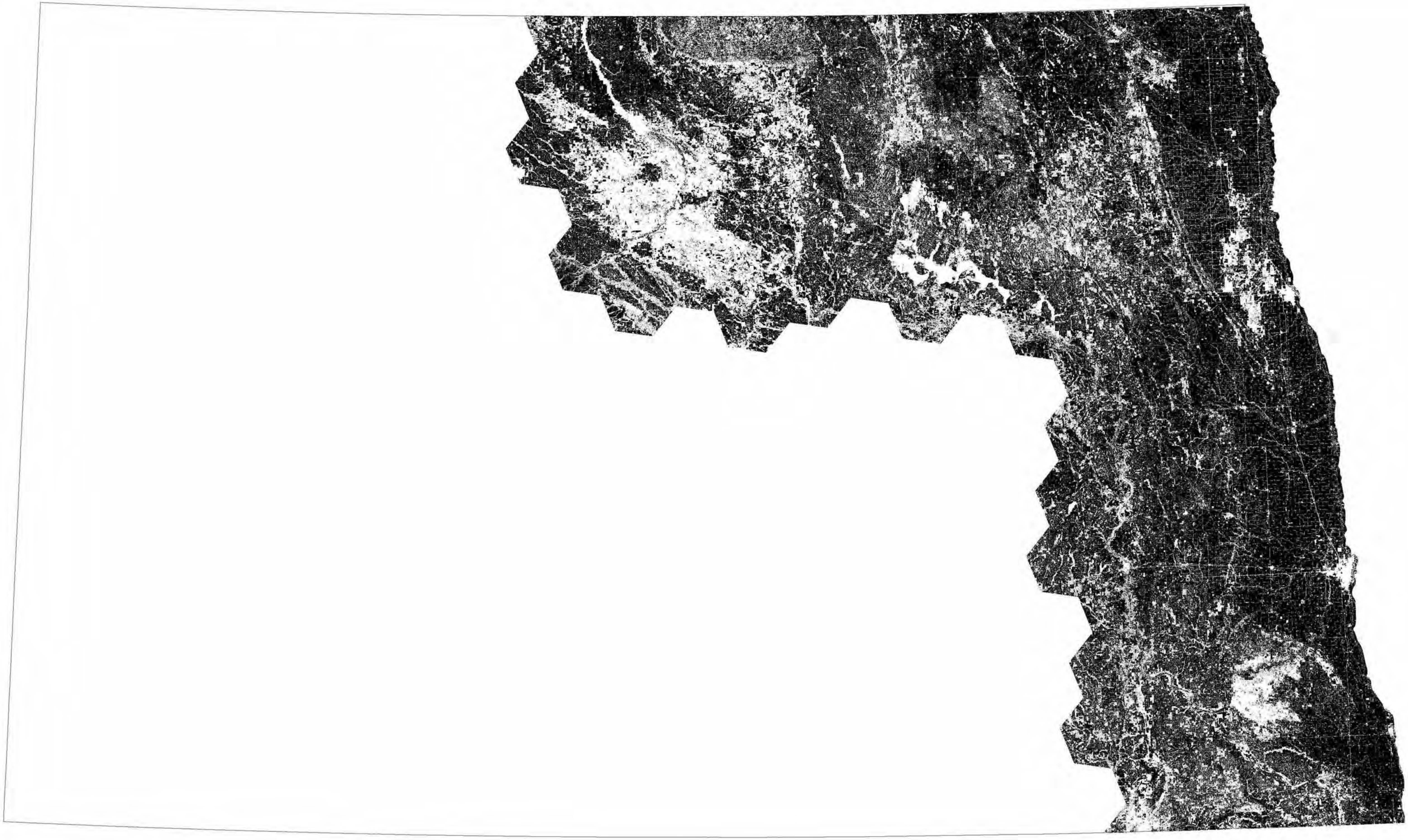


Virginia Opossum(Didelphis virginiana)

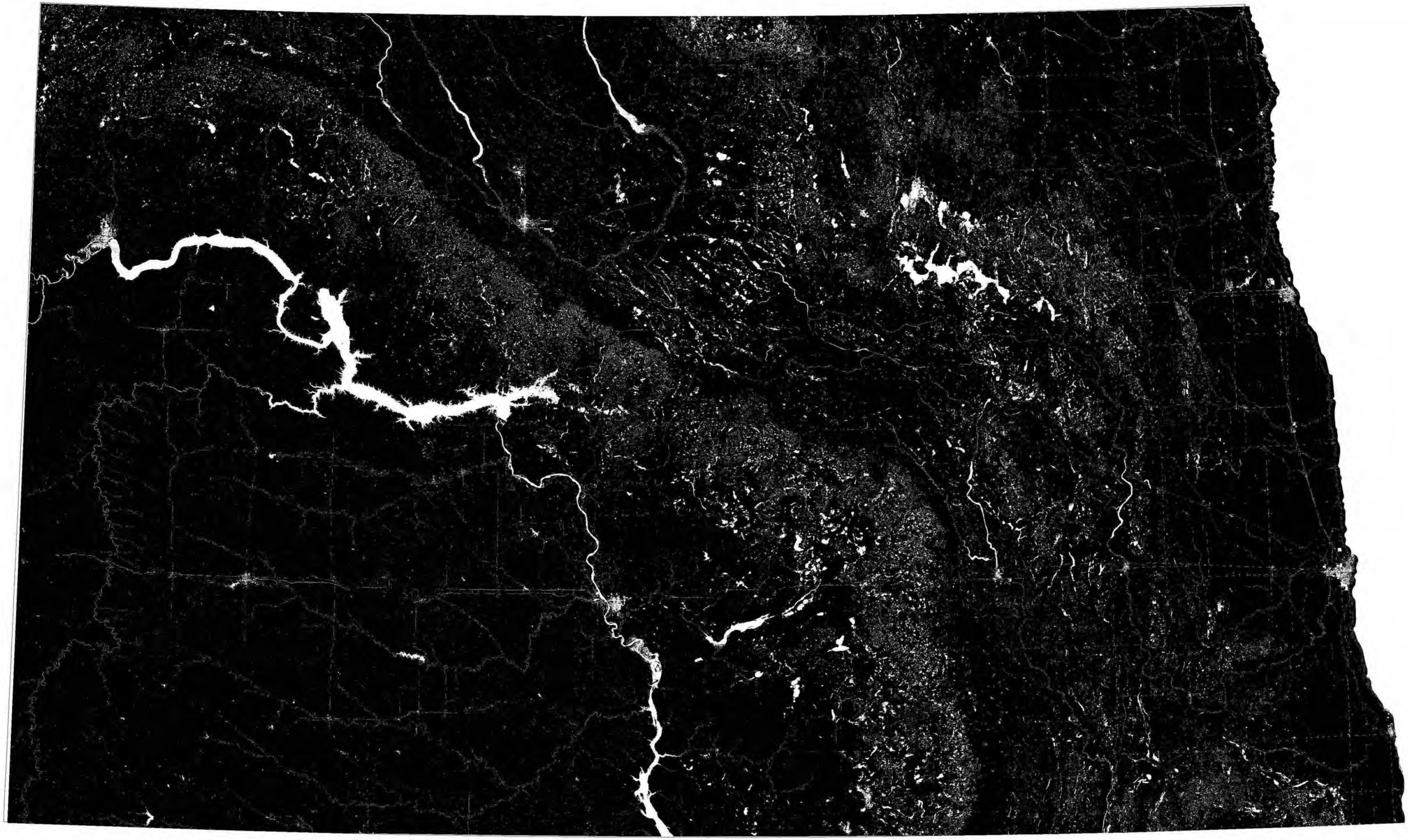
Pronghorn(Antilocapridae americana)



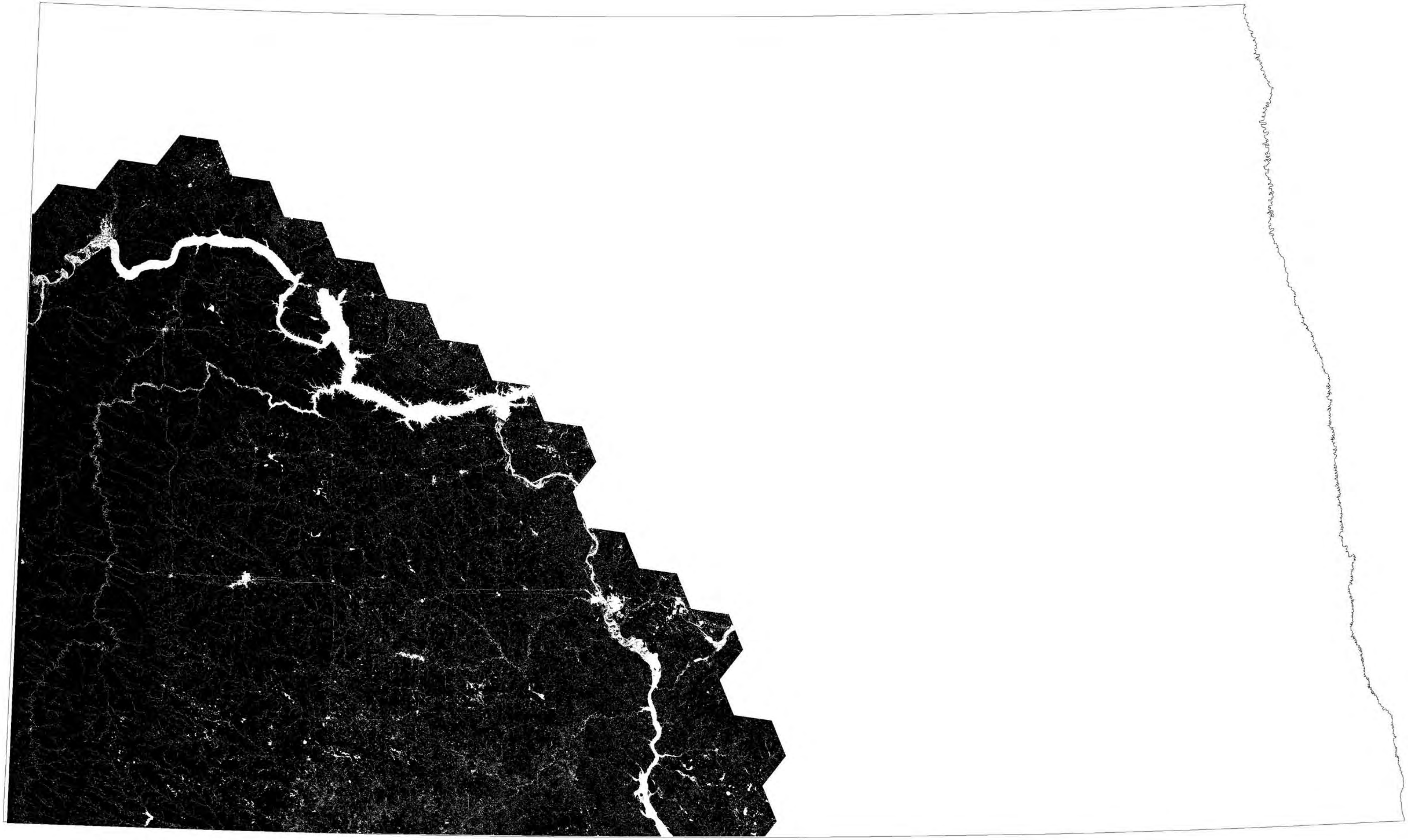
Moose(Alces Alces)



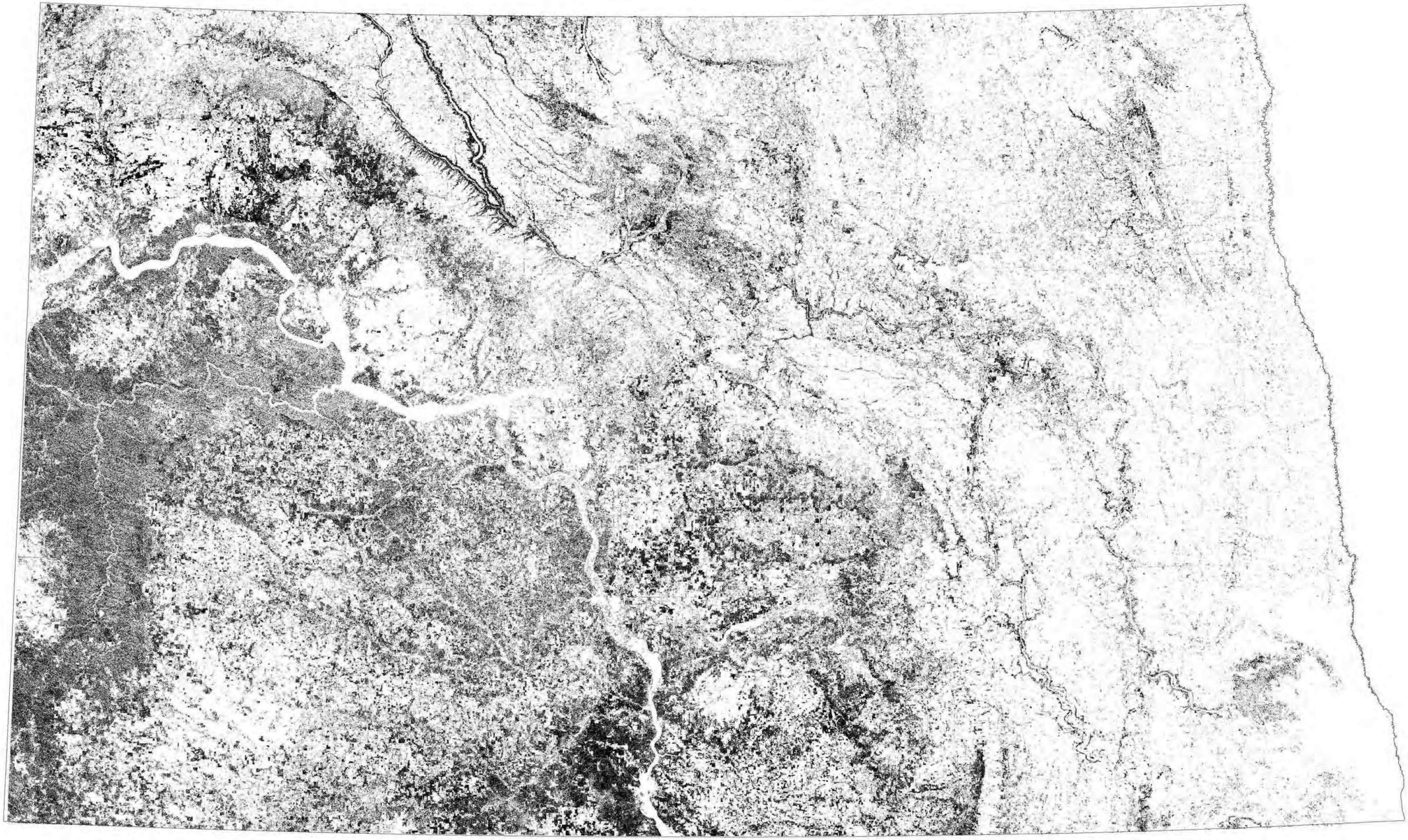
White-tailed Deer(Odocoileus virginianus)



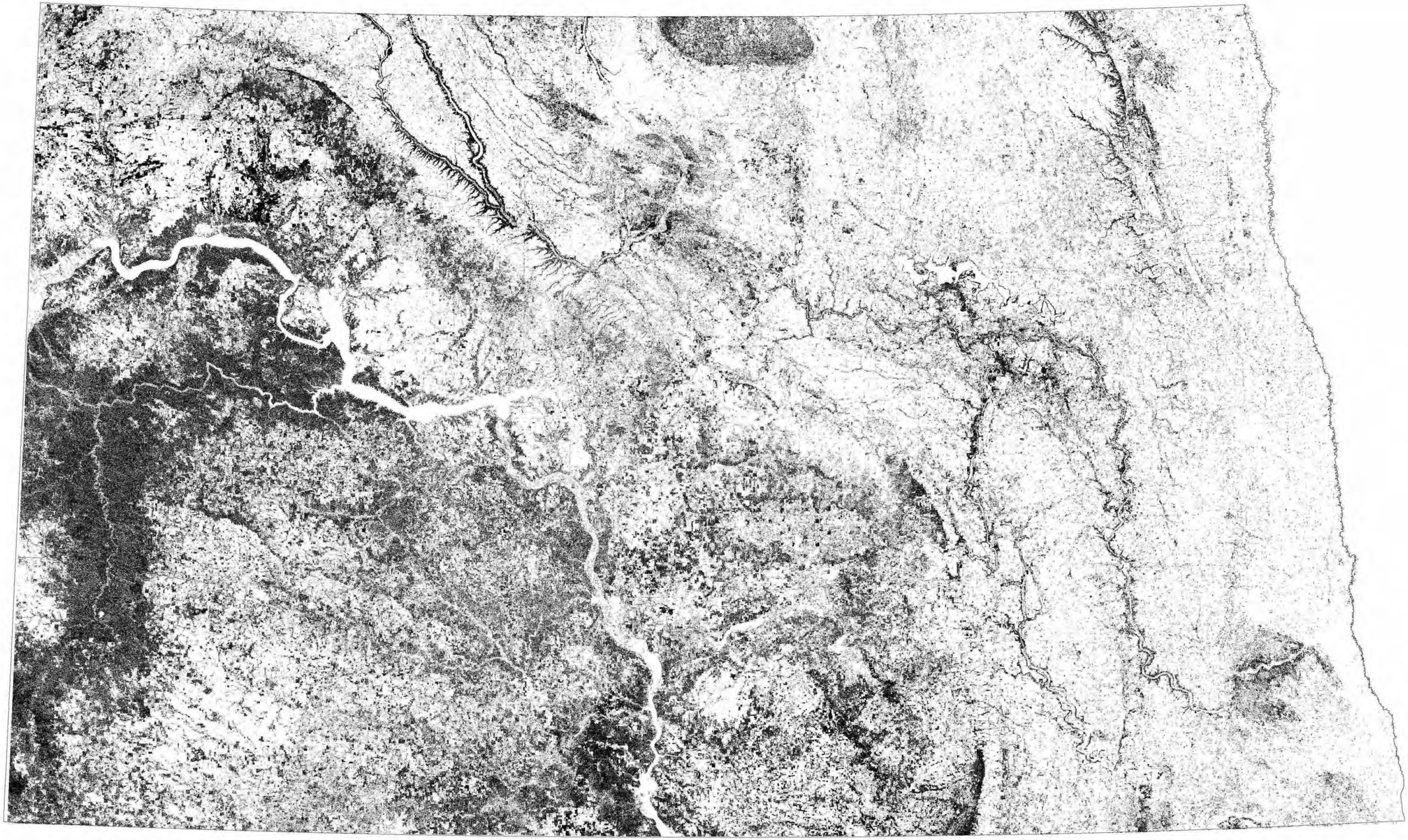
Mule Deer(Odocoileus hemionus)



Elk (Cervus elaphus)

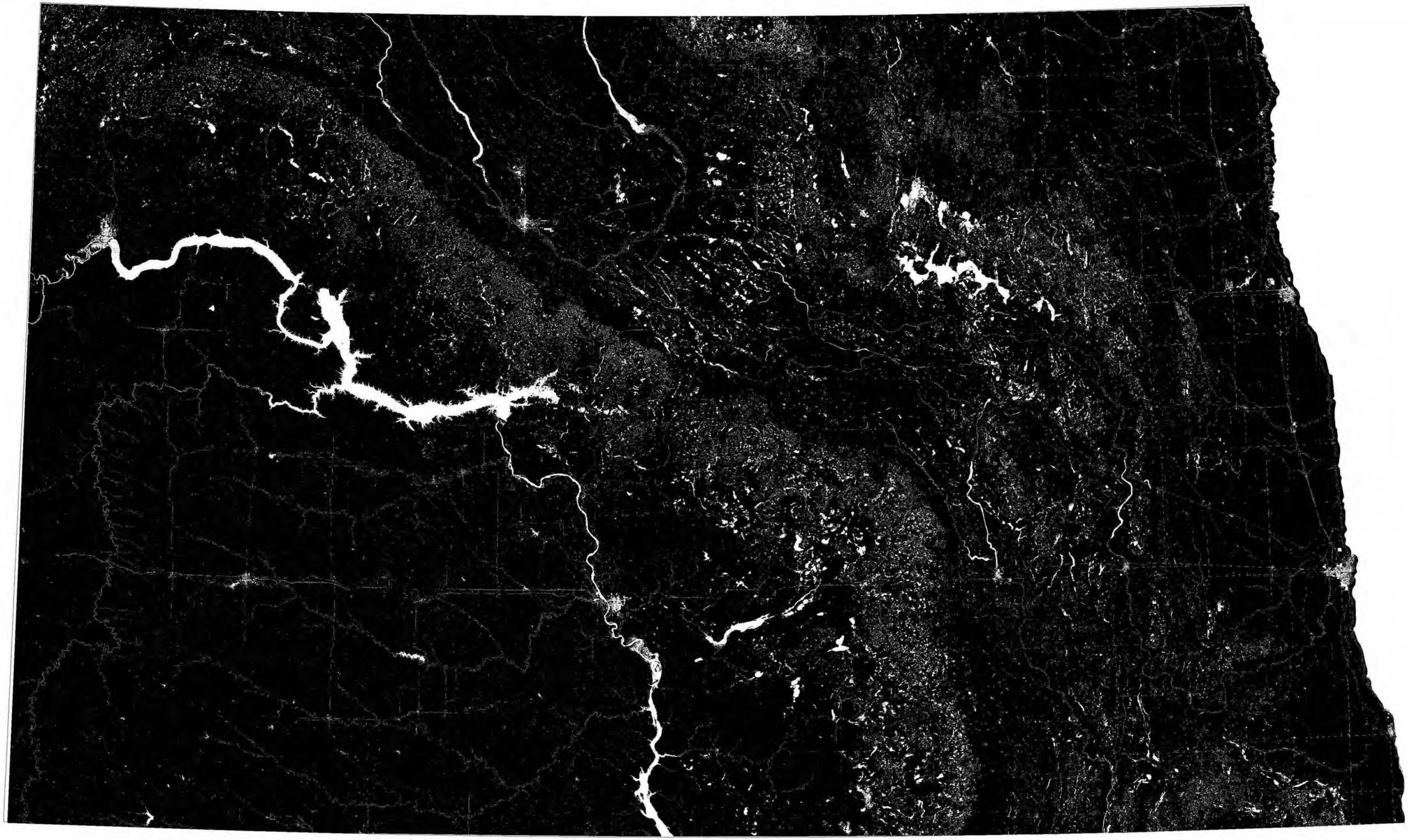


Bobcat(Felis rufus)

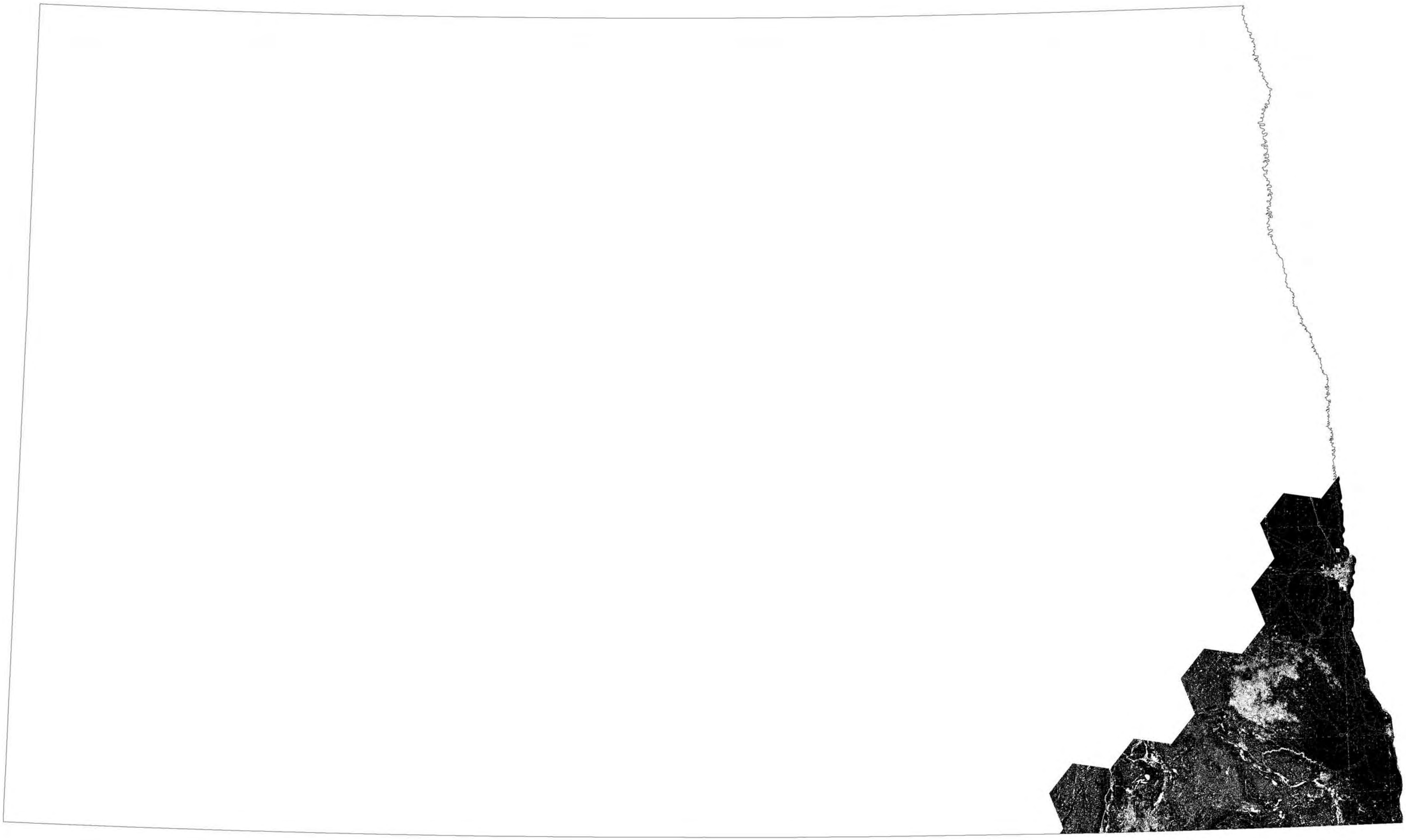


River Otter(Lutra canadensis)

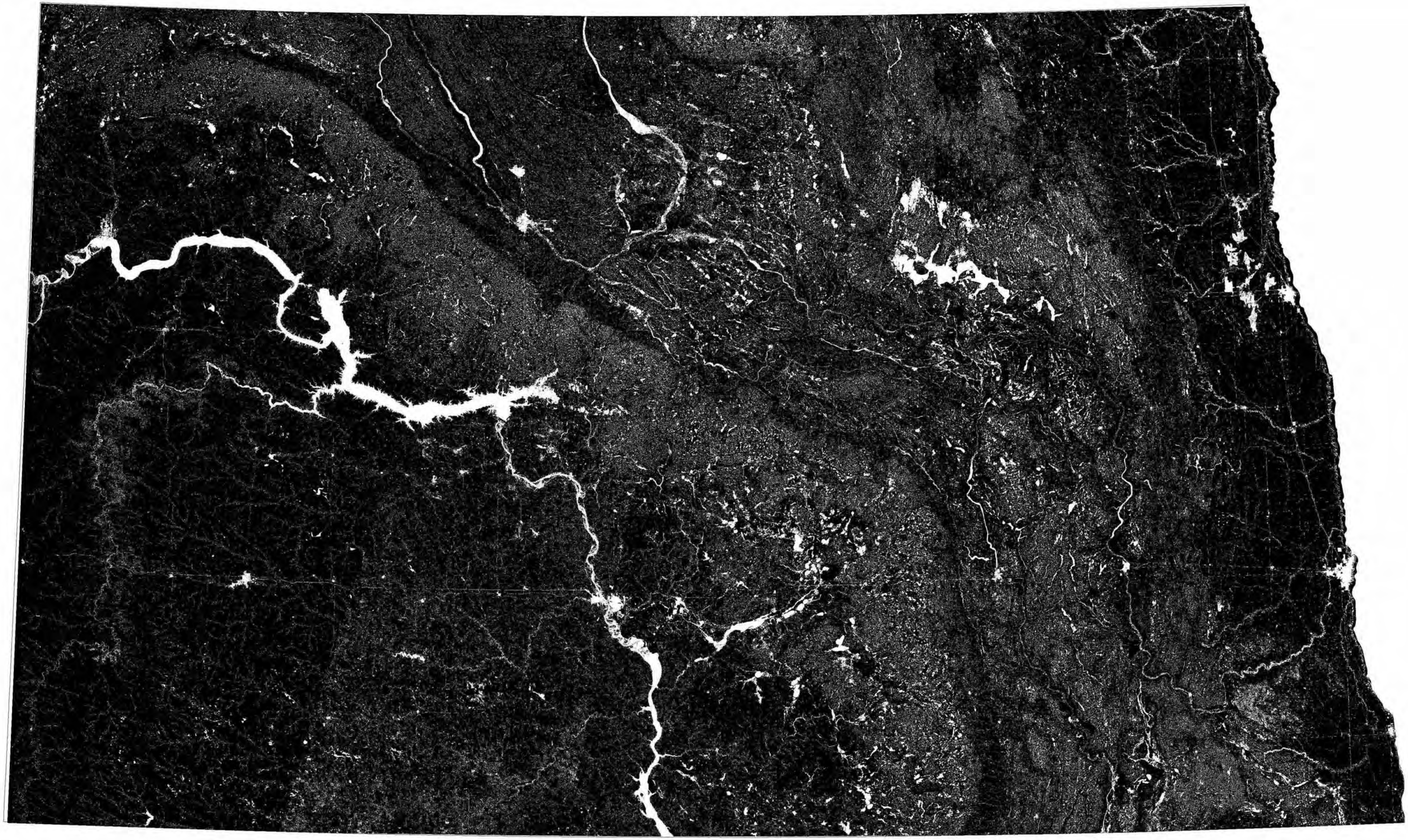
Striped Skunk(Mephitis mephitis)



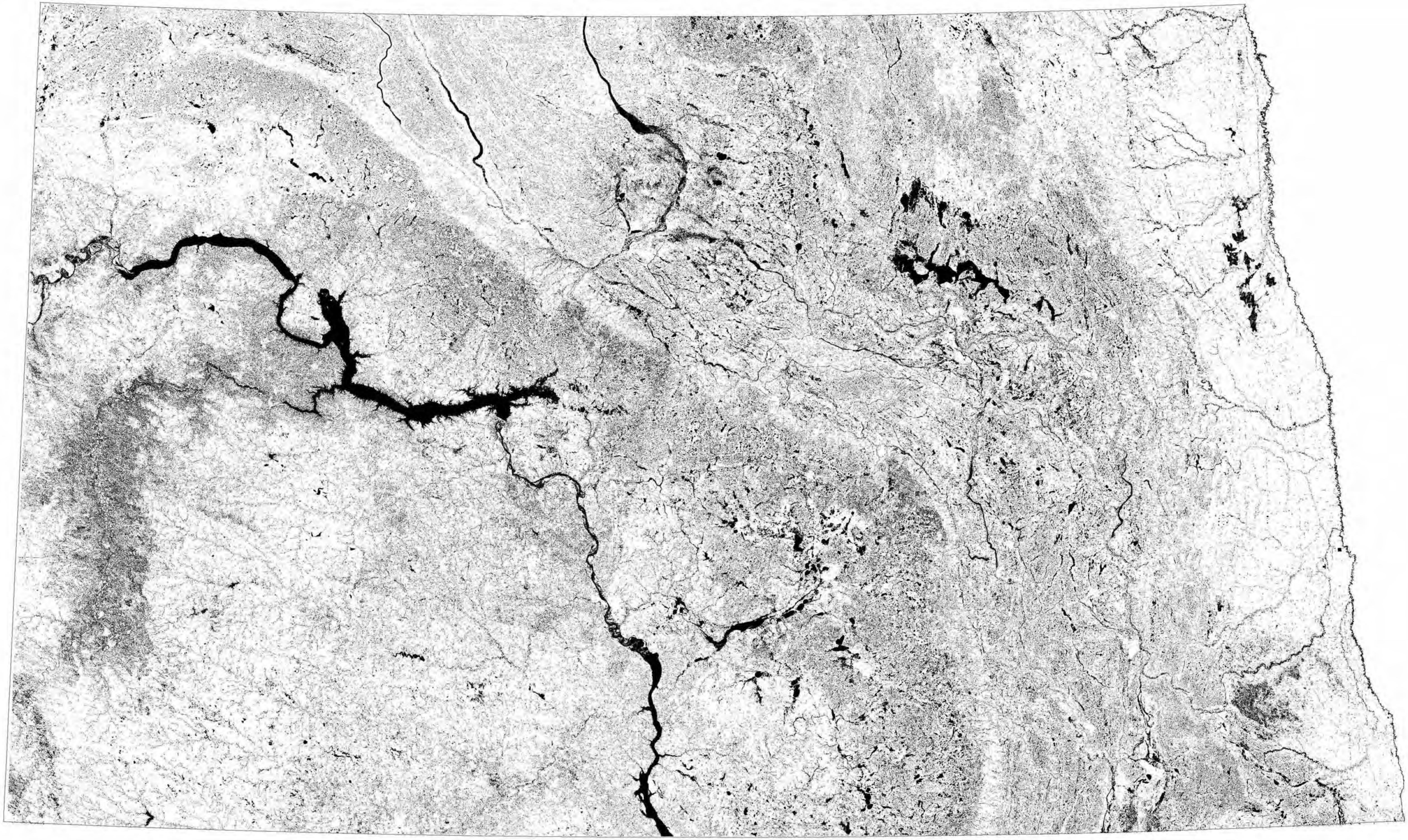
Eastern Spotted Skunk(Spilogale putorious)



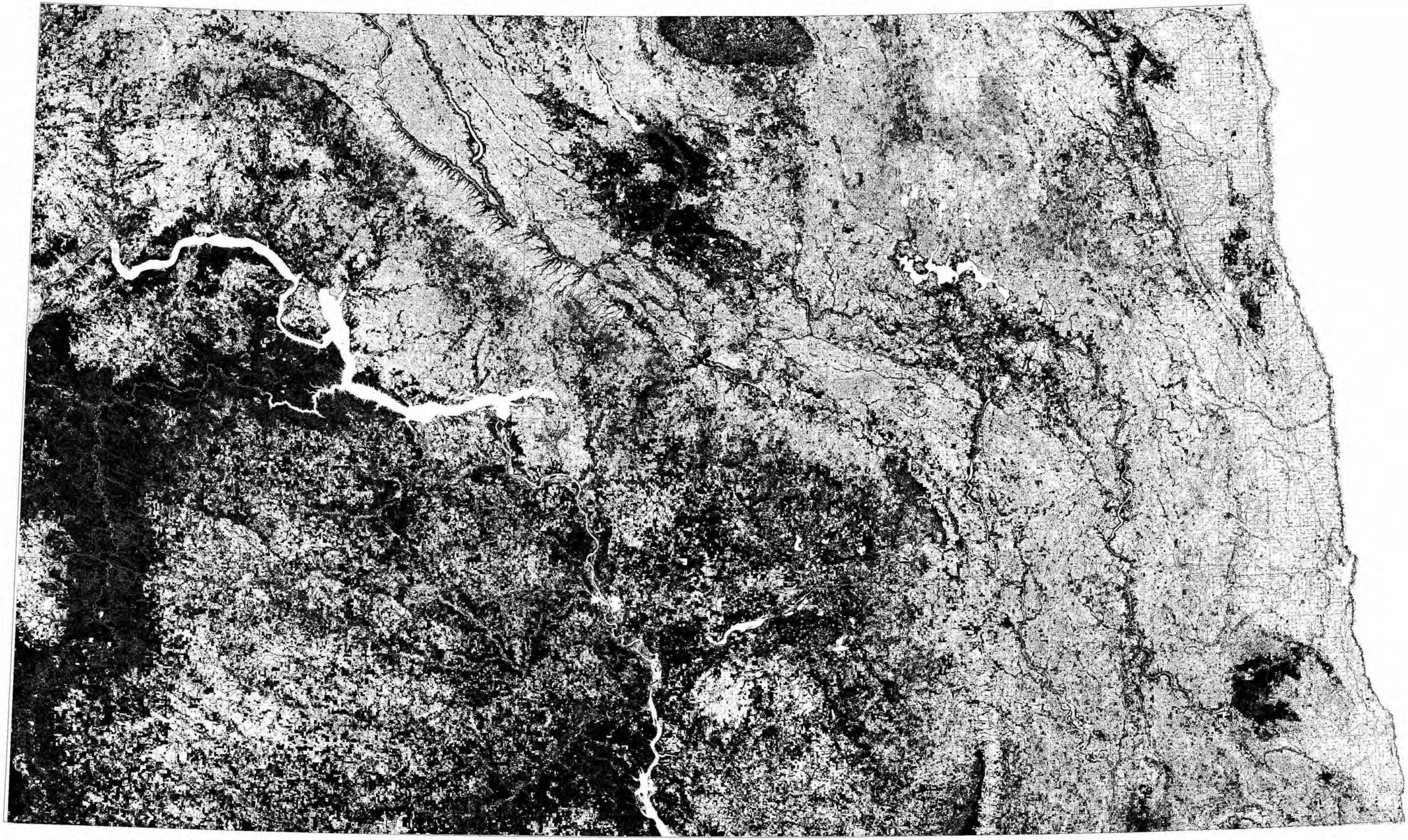
American Badger(Taxidea taxus)



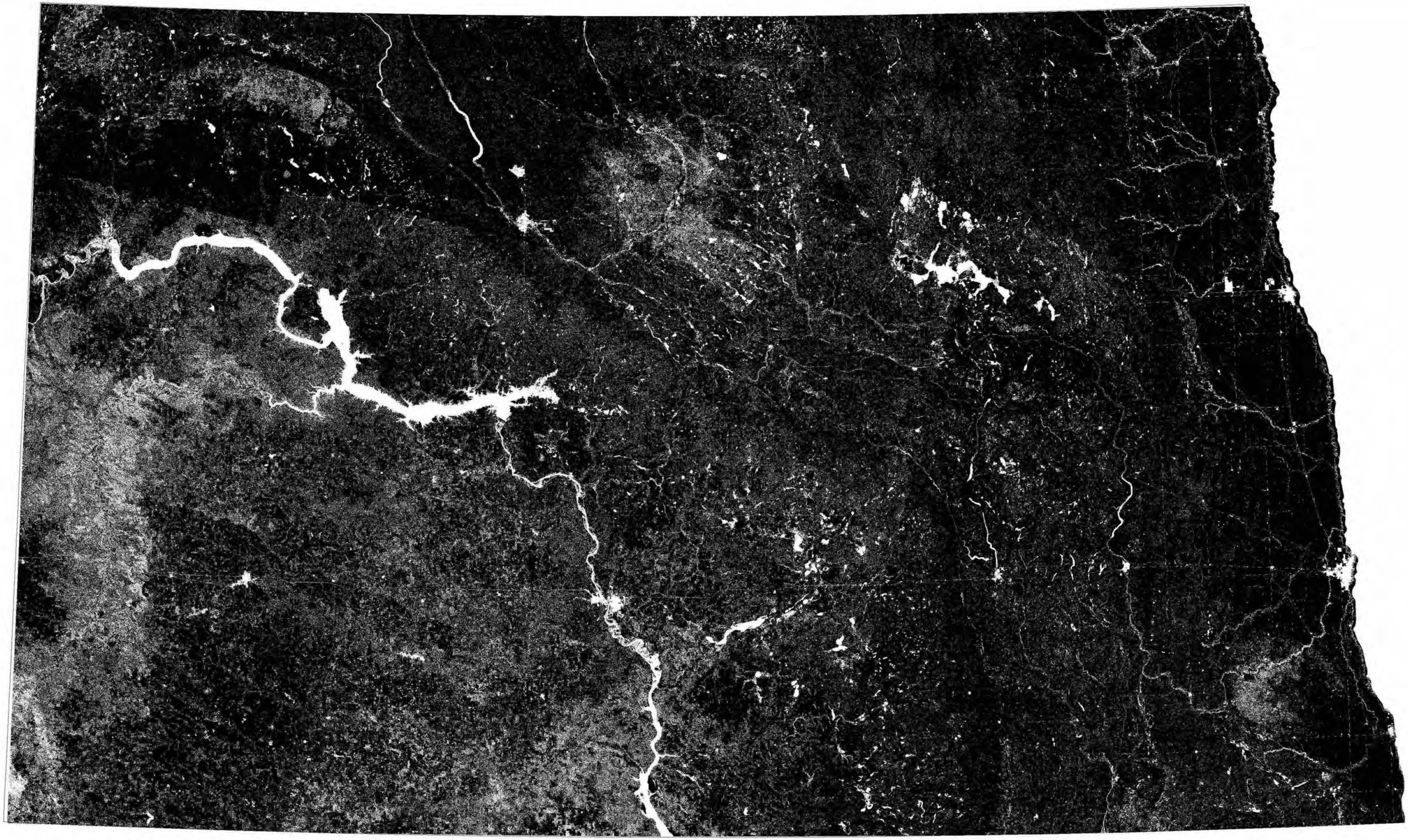
Mink(Mustela vison)



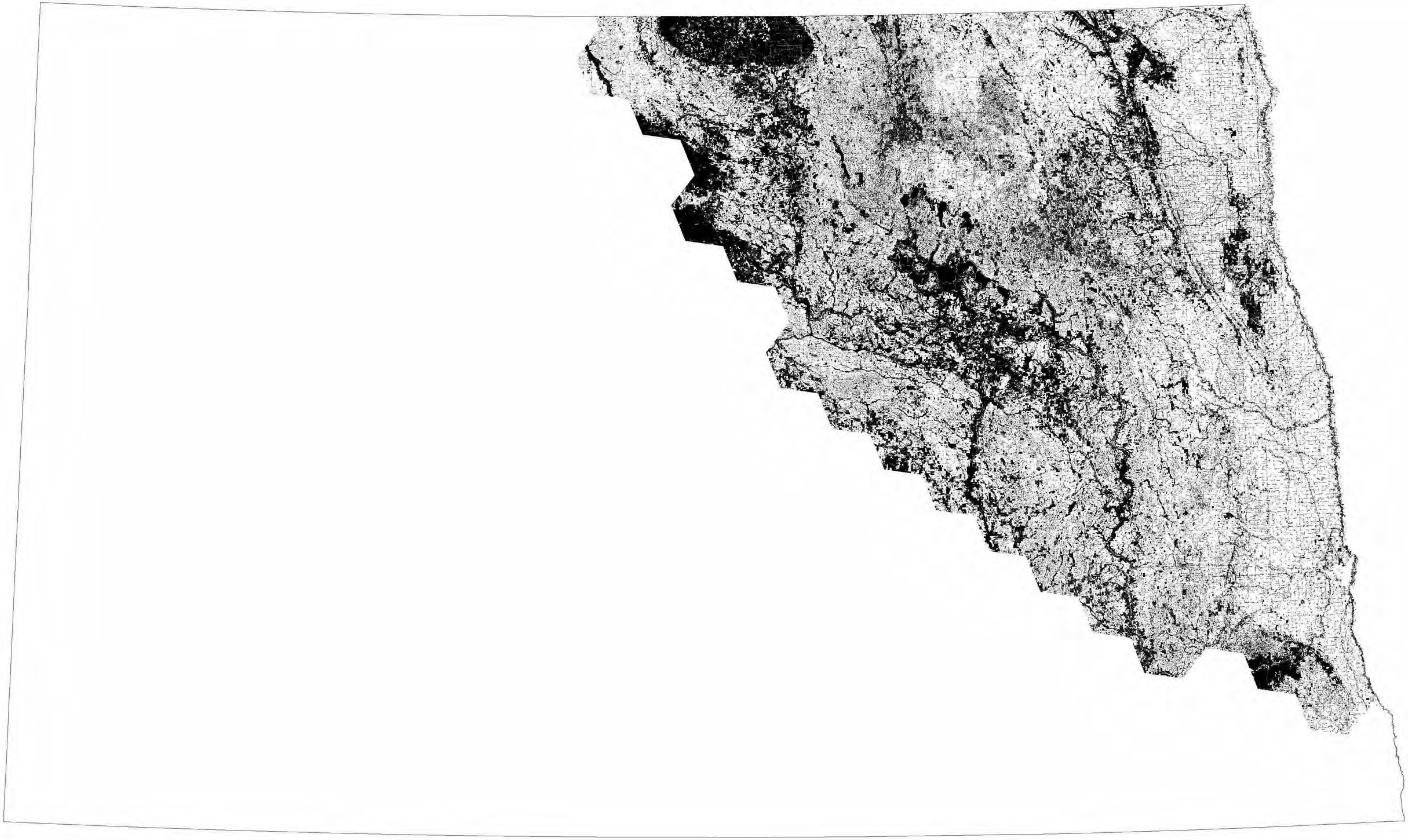
Long-tailed Weasel(Mustela frenata)

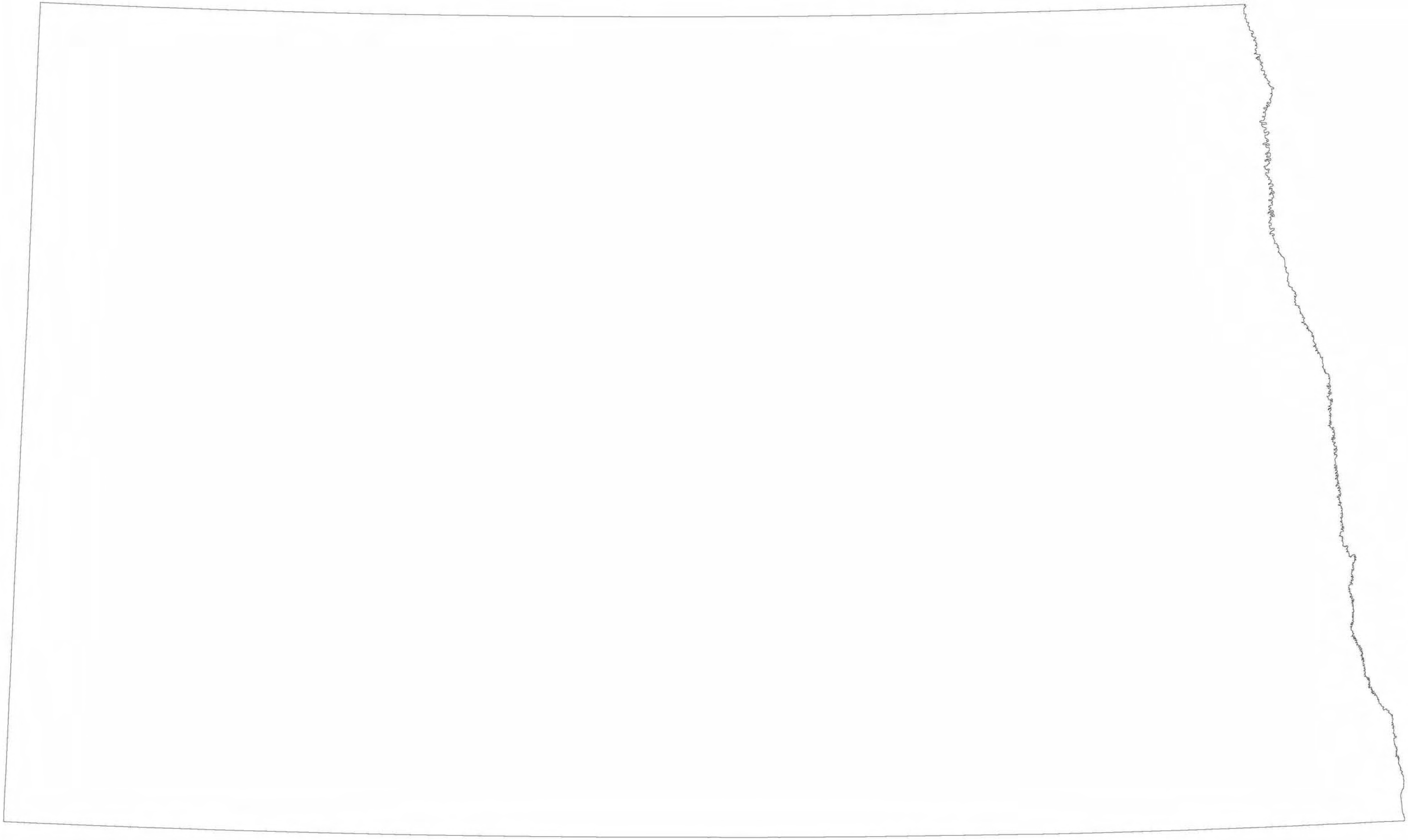


Least Weasel(Mustela nivalis)

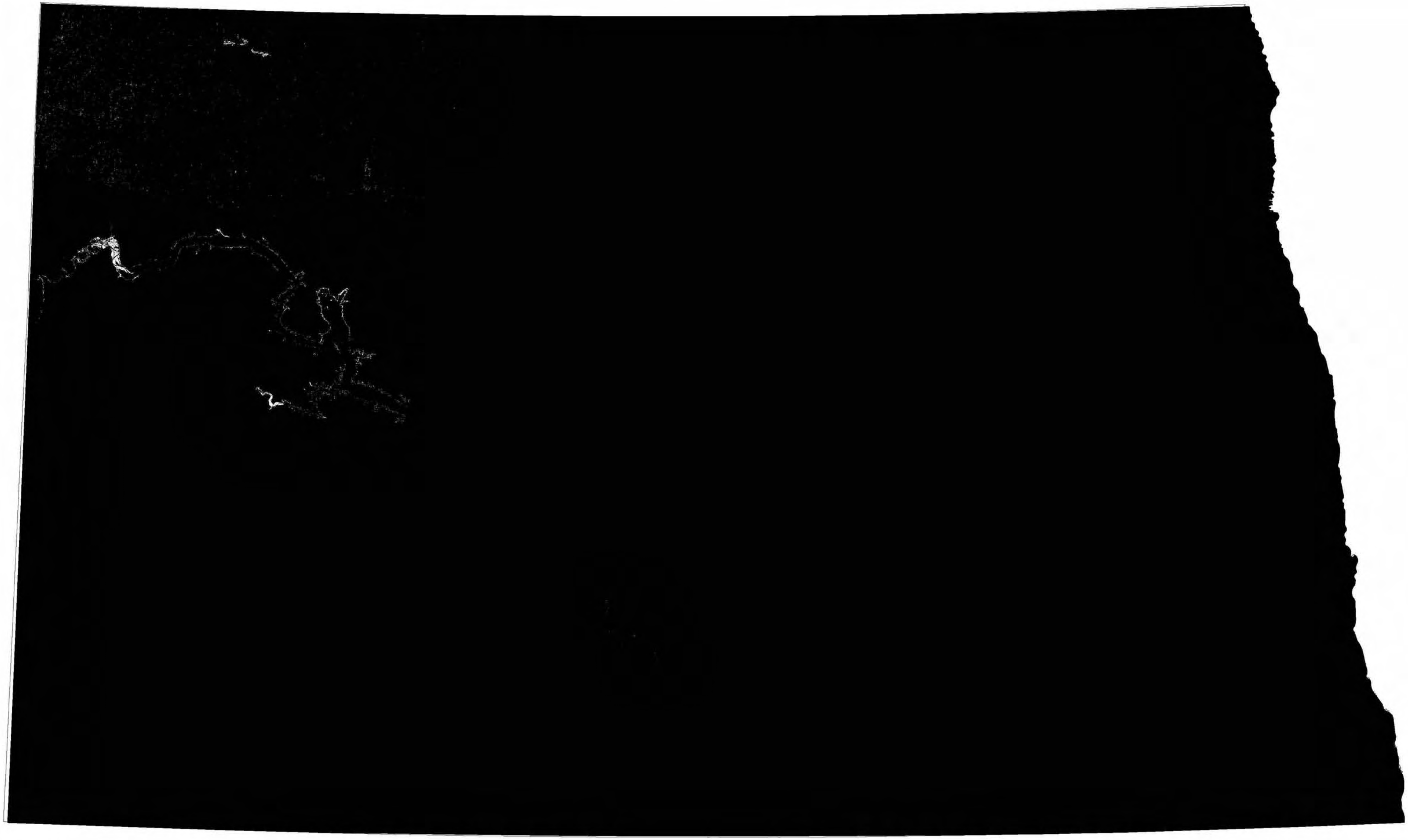


Ermine(Mustela erminea)

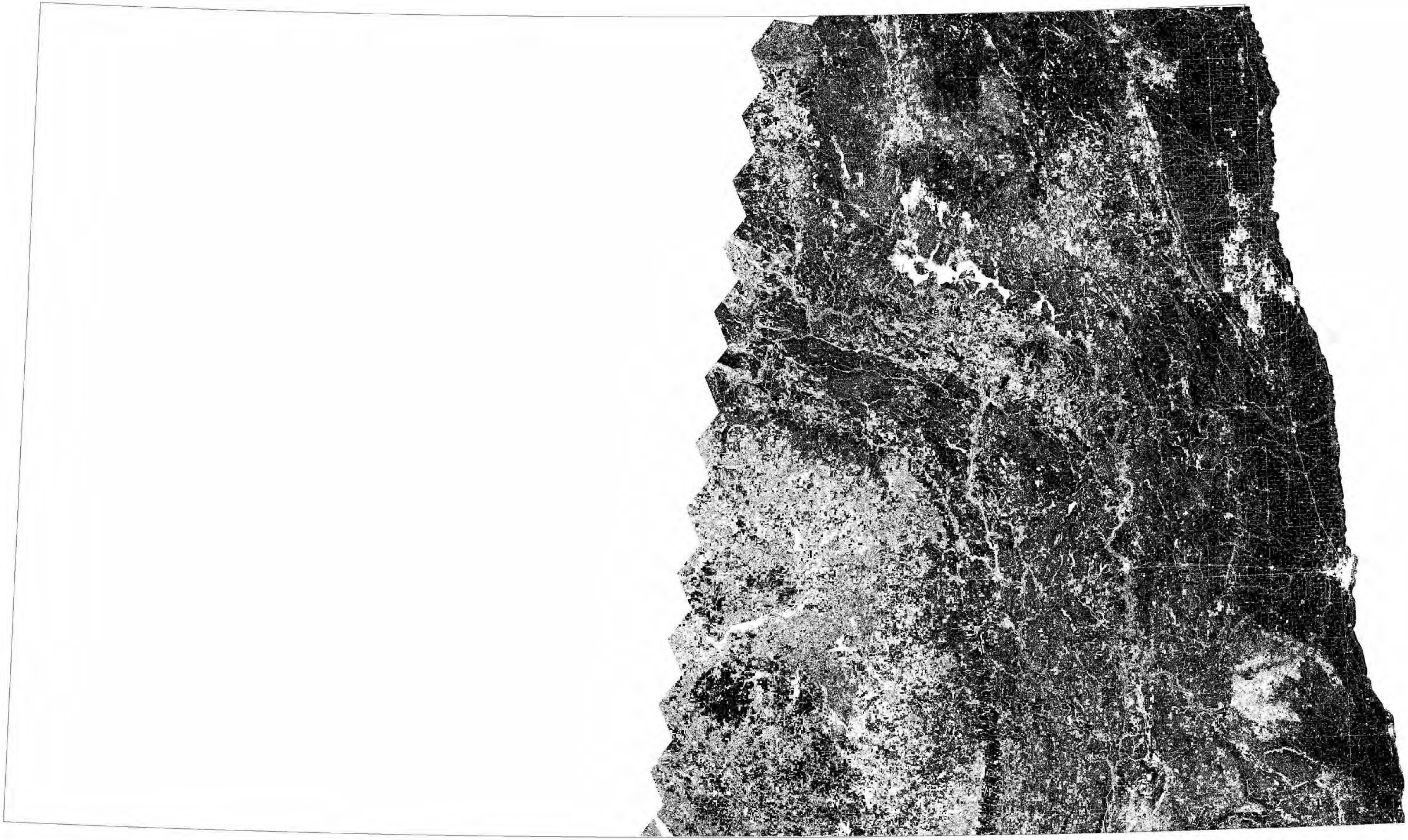




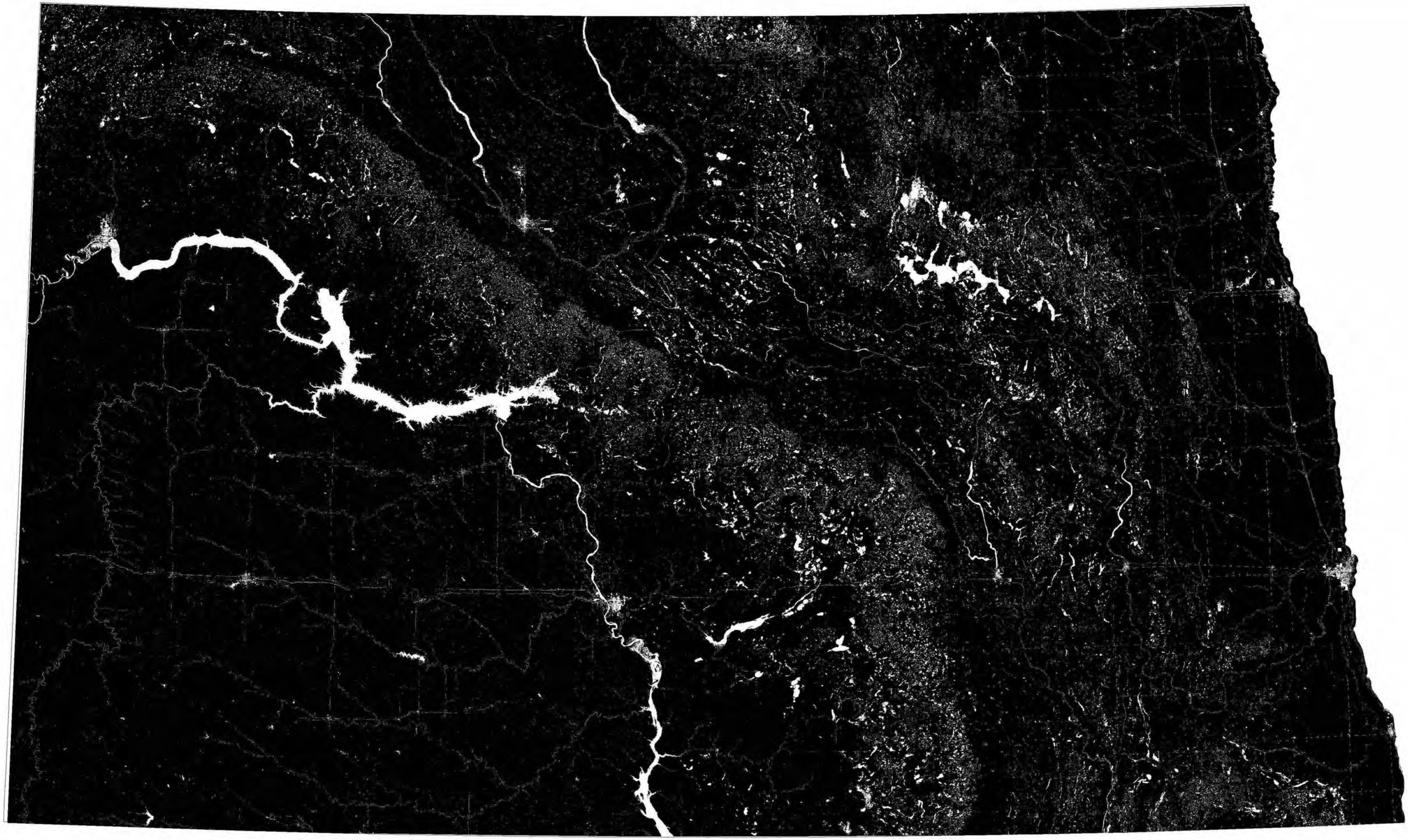
Common Raccoon(Procyon lotor)



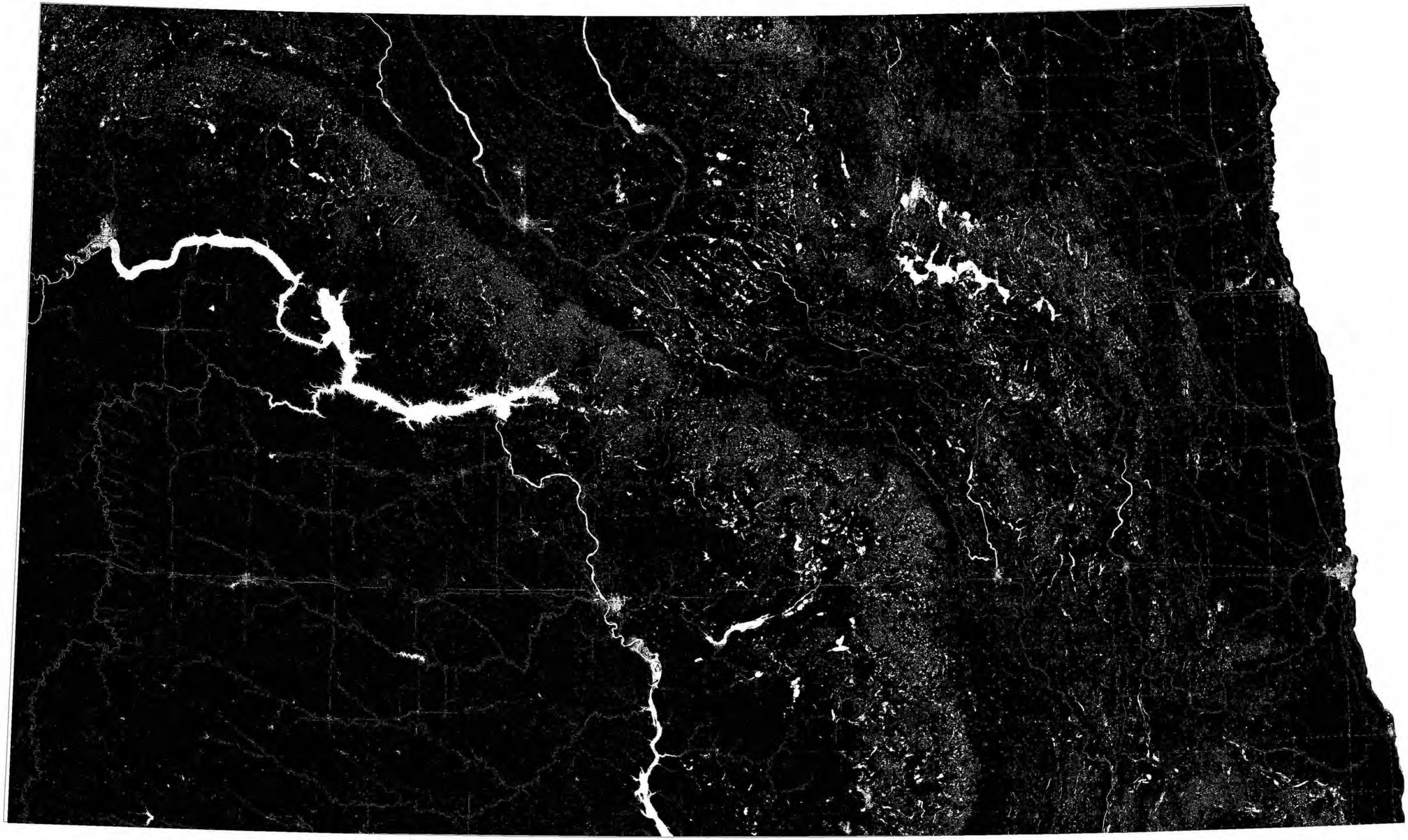
Common Gray Fox(Urocyon cineroargenteus)



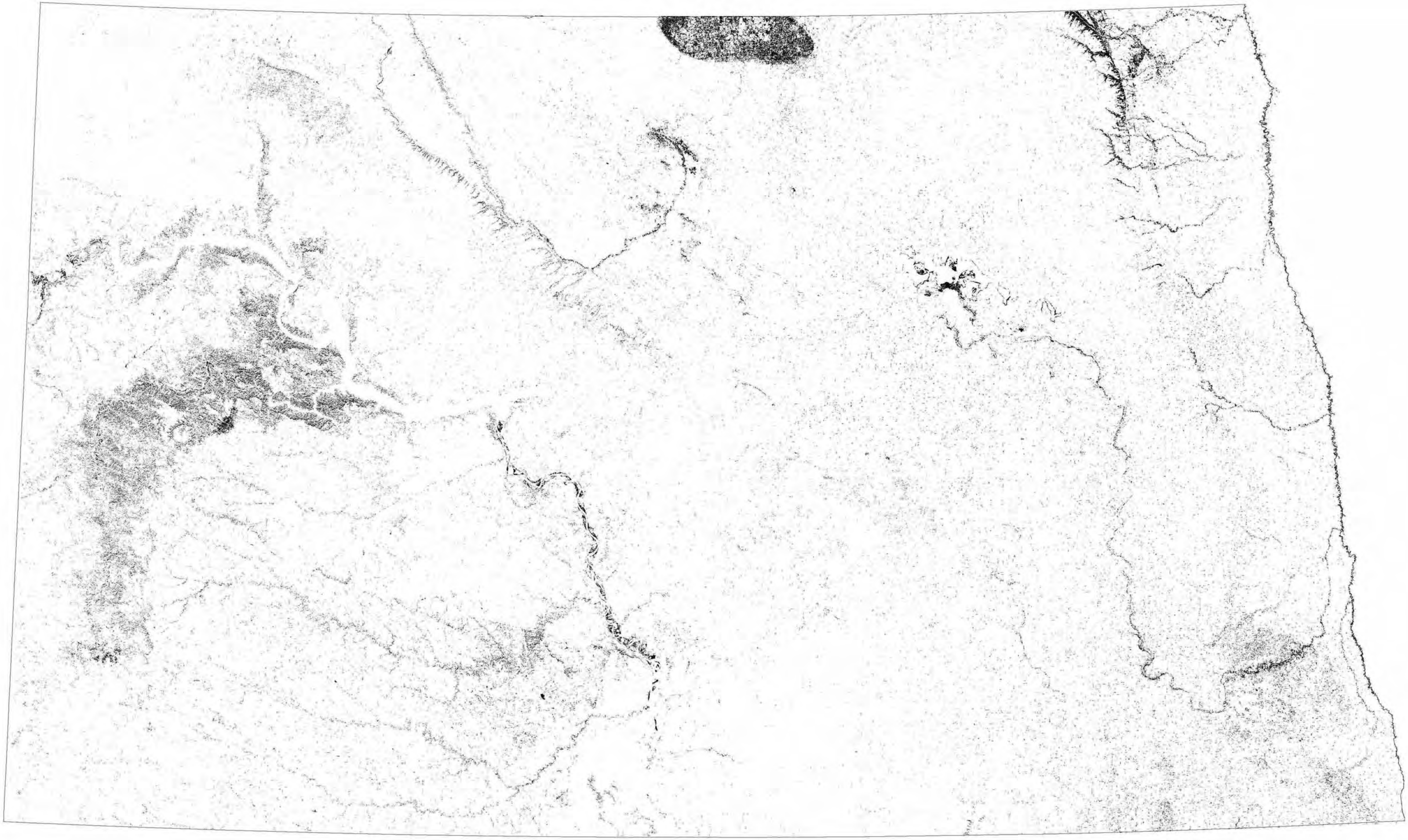
Red Fox(Vulpes vulpes)



Coyote(Canis Latrans)

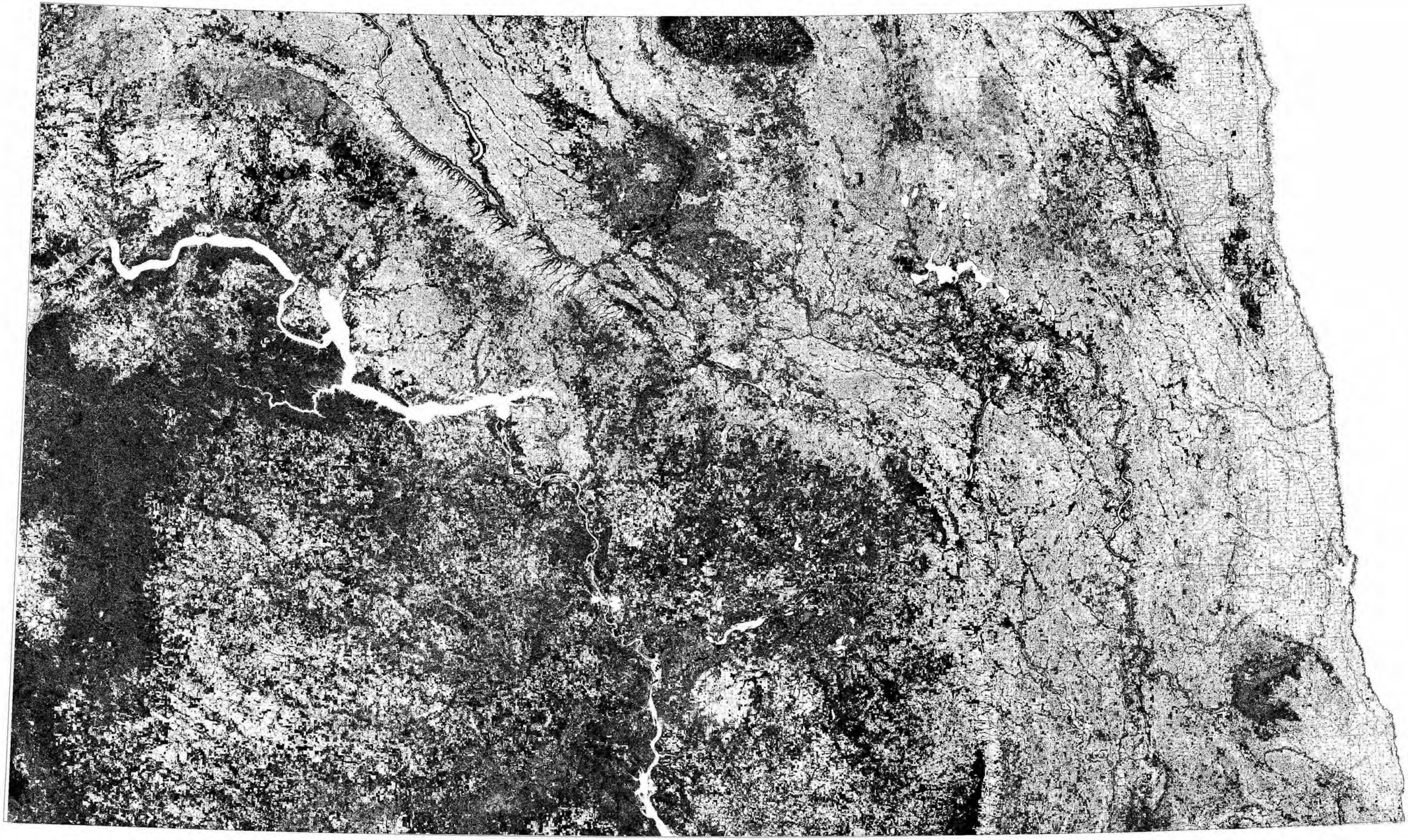


Common Porcupine(Erethizon dorsatum)

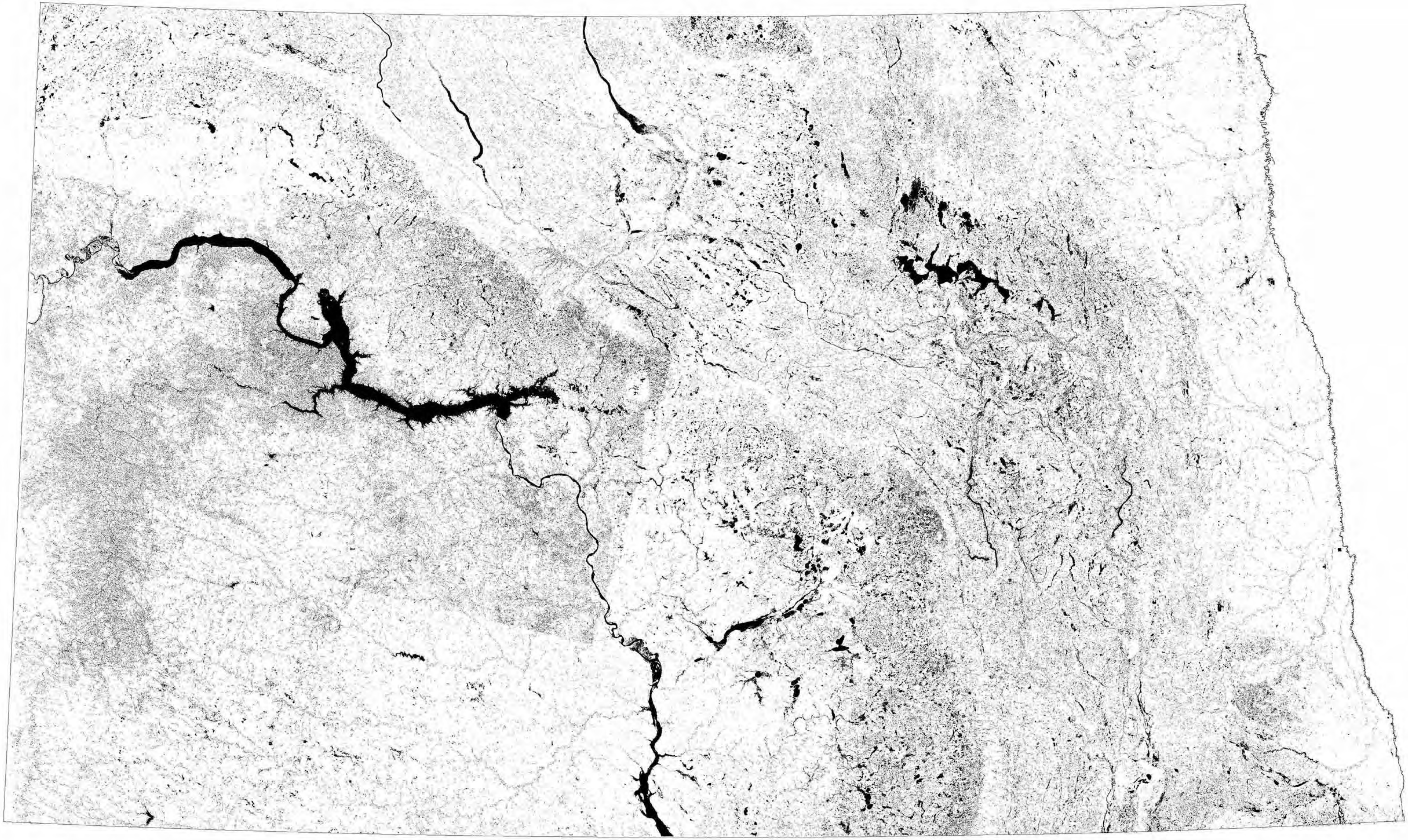


Western Jumping Mouse(Zapus princeps)

Meadow Jumping Mouse(Zapus hudsonius)

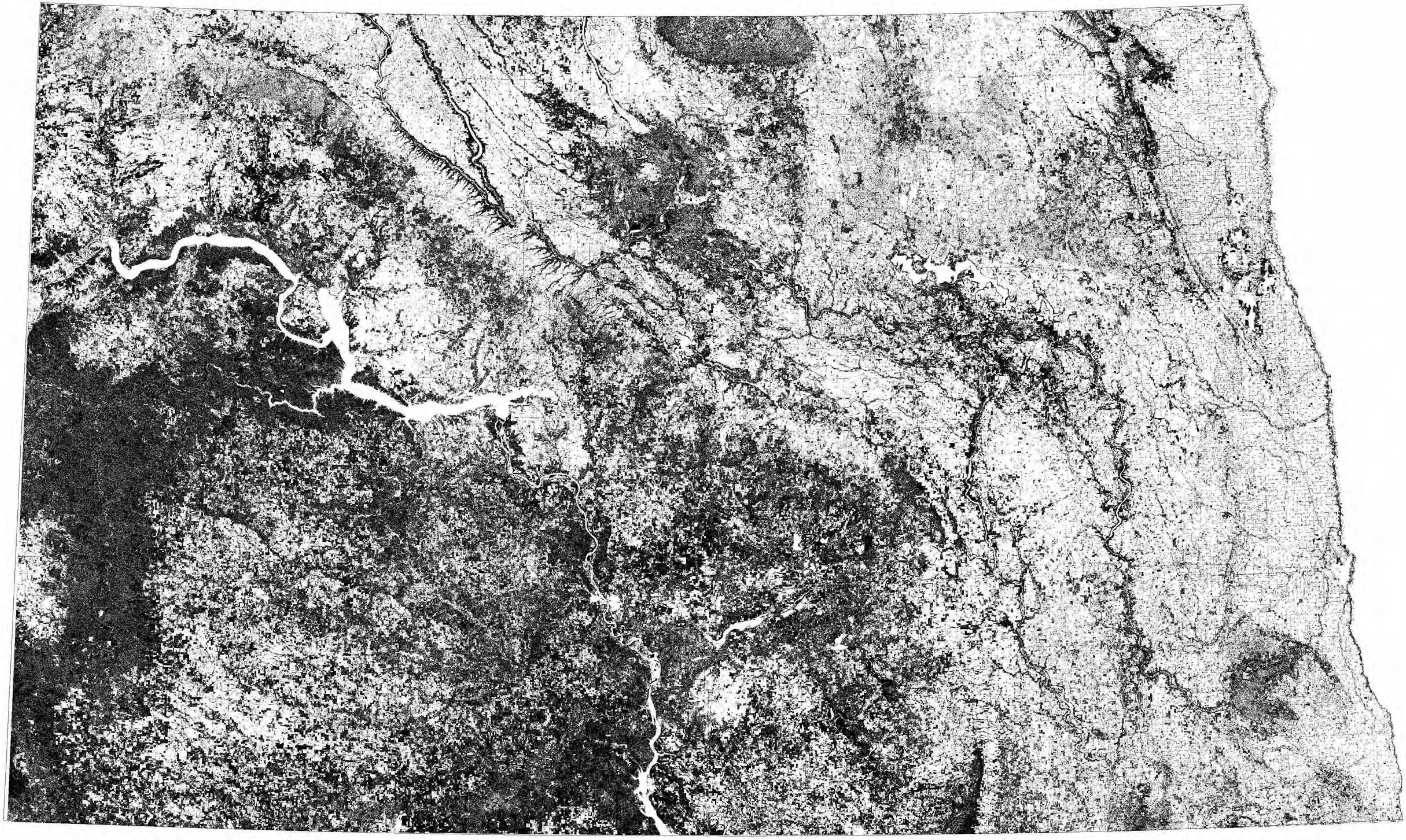


Muskrat(Ondatra zibethicus)

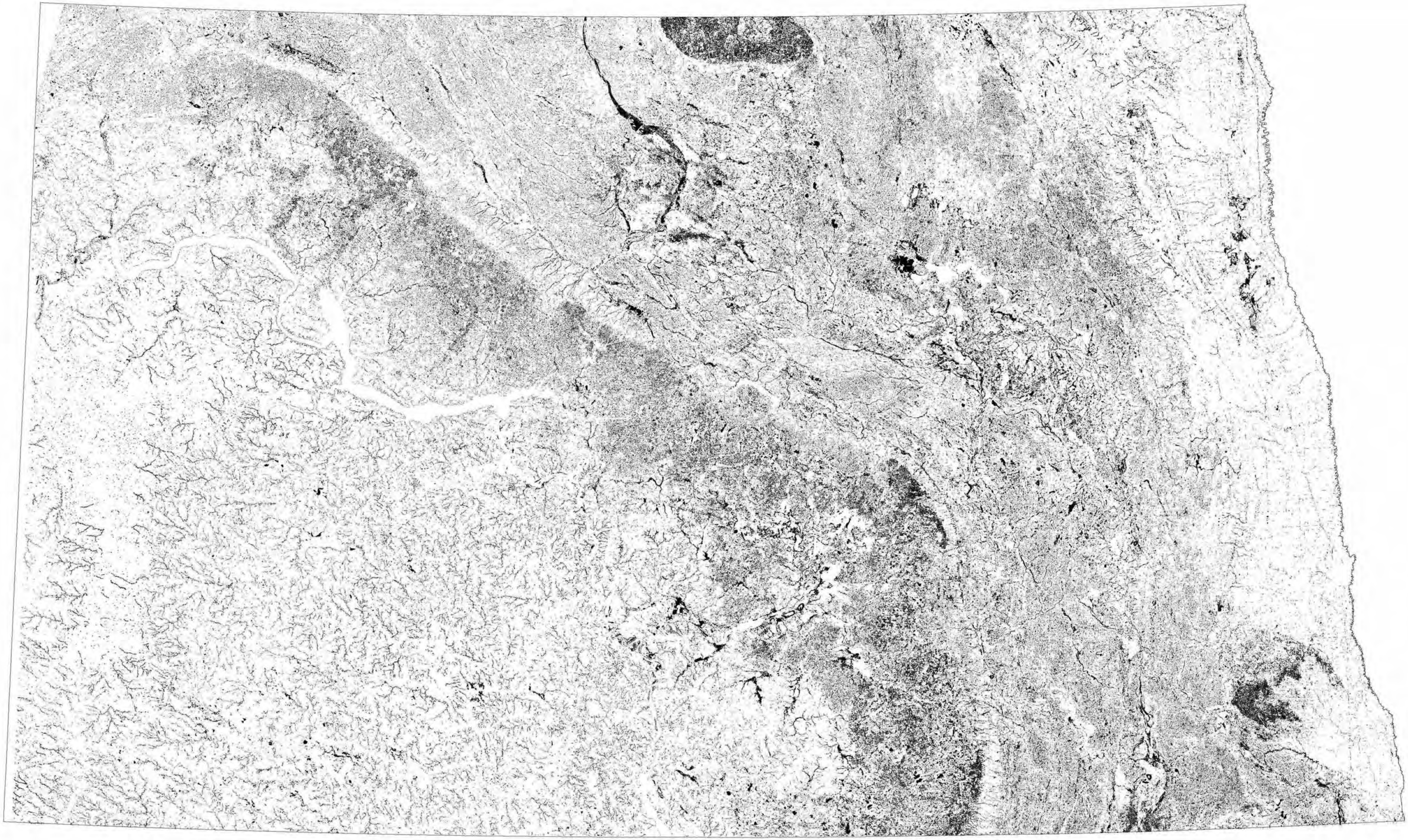


Sagebrush Vole(Lagurus curtatus)

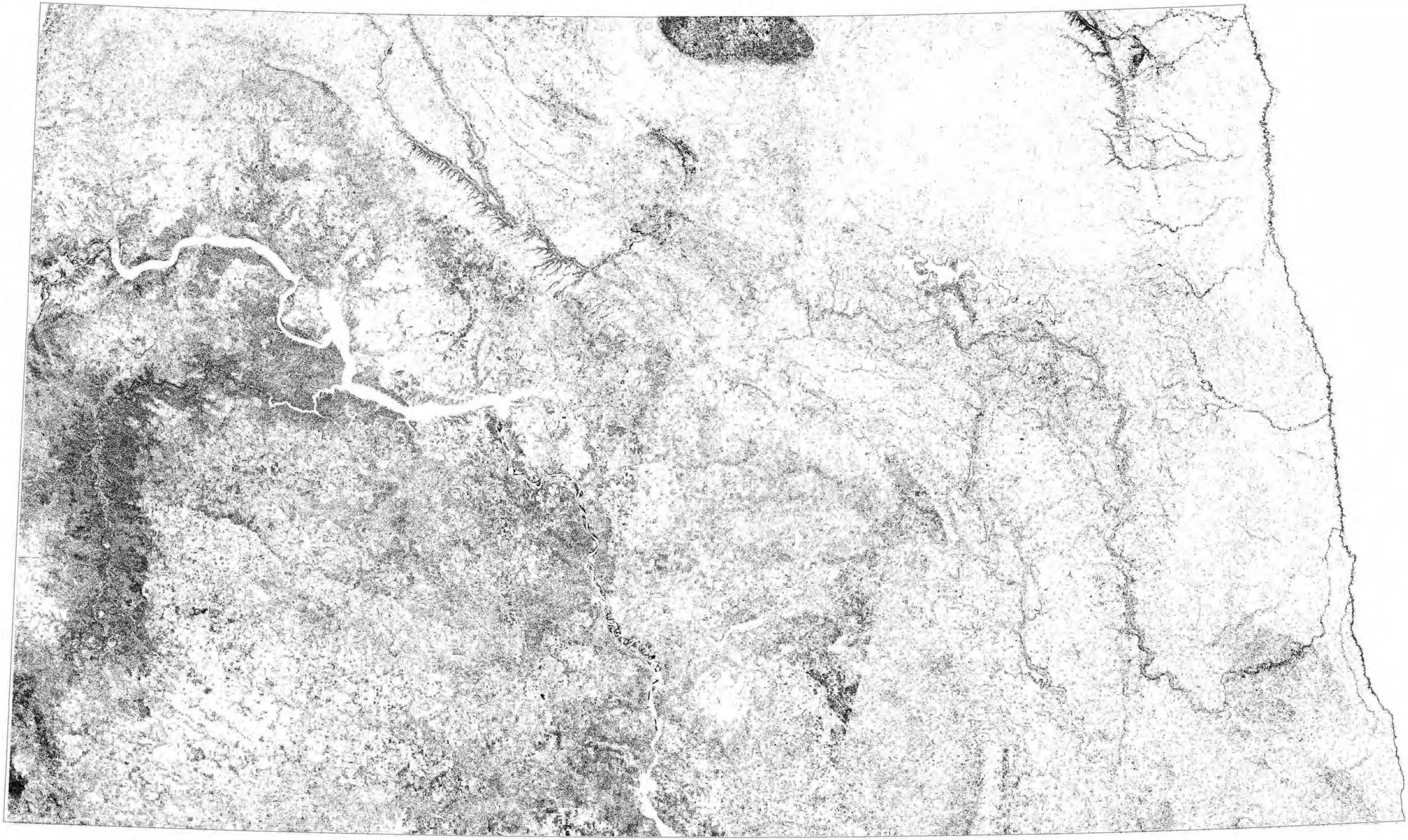
Prairie Vole(Microtus ochrogaster)



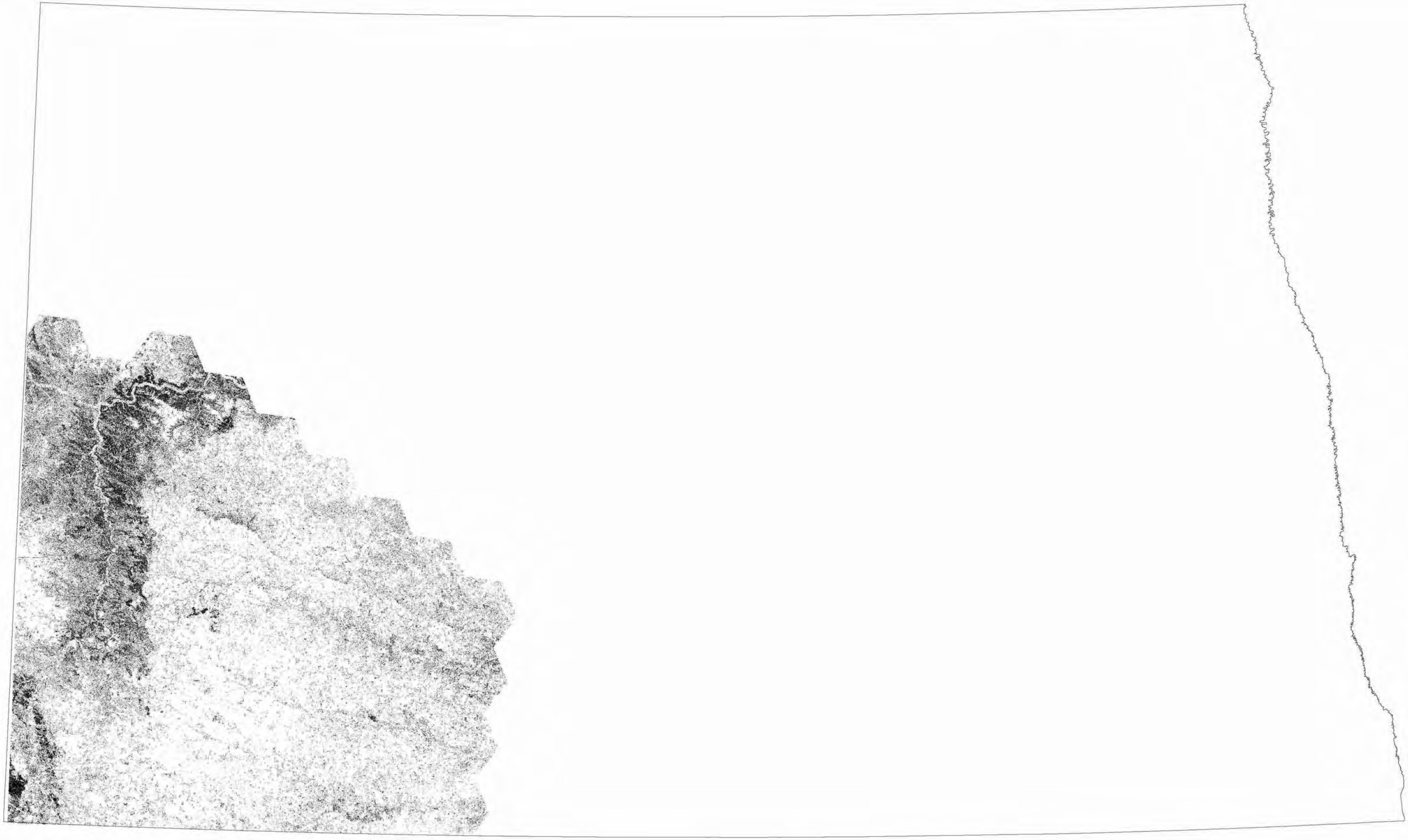
Meadow Vole(Microtus pennsylvanicus)



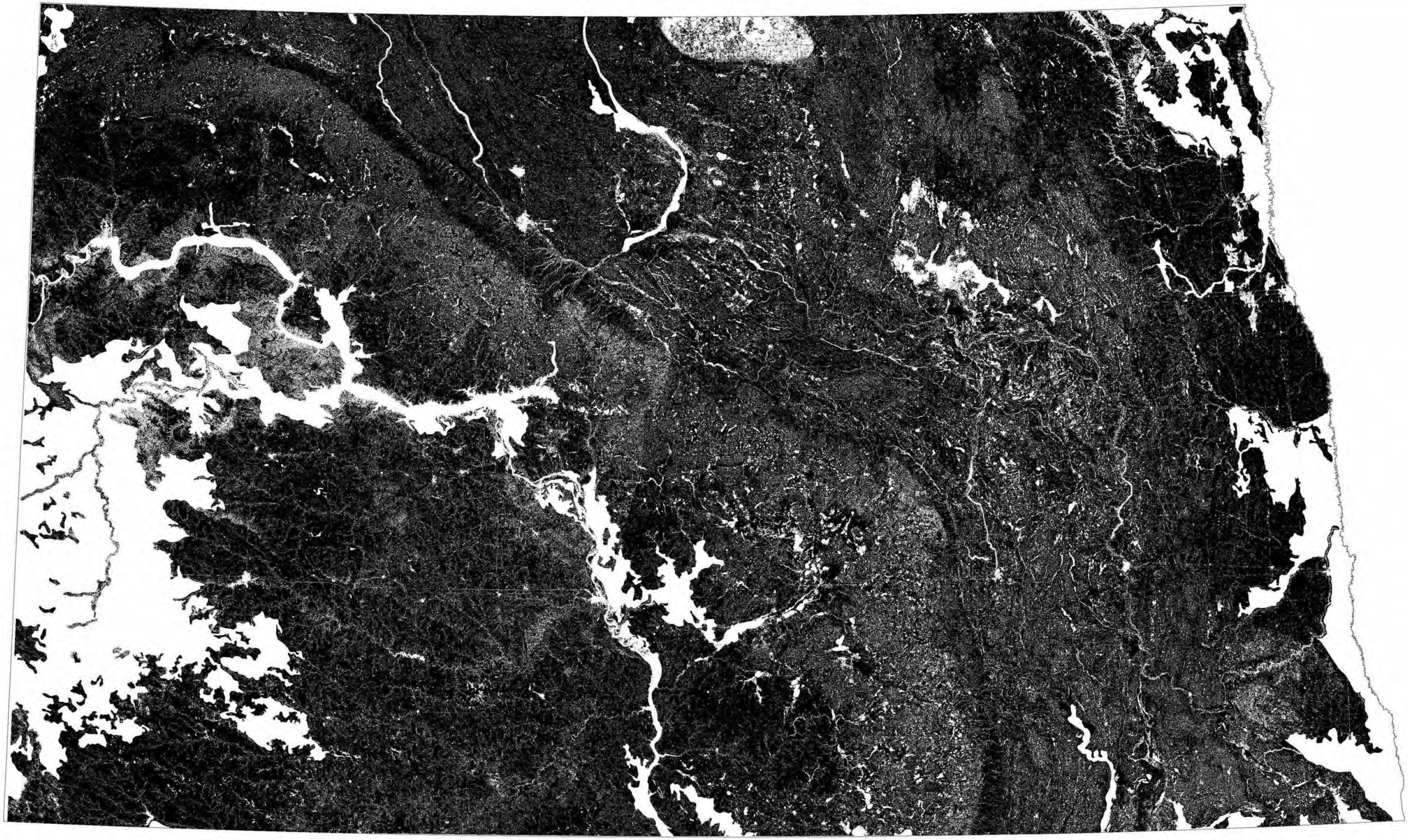
Southern Red-backed Vole(Clethrionomys gapperi)



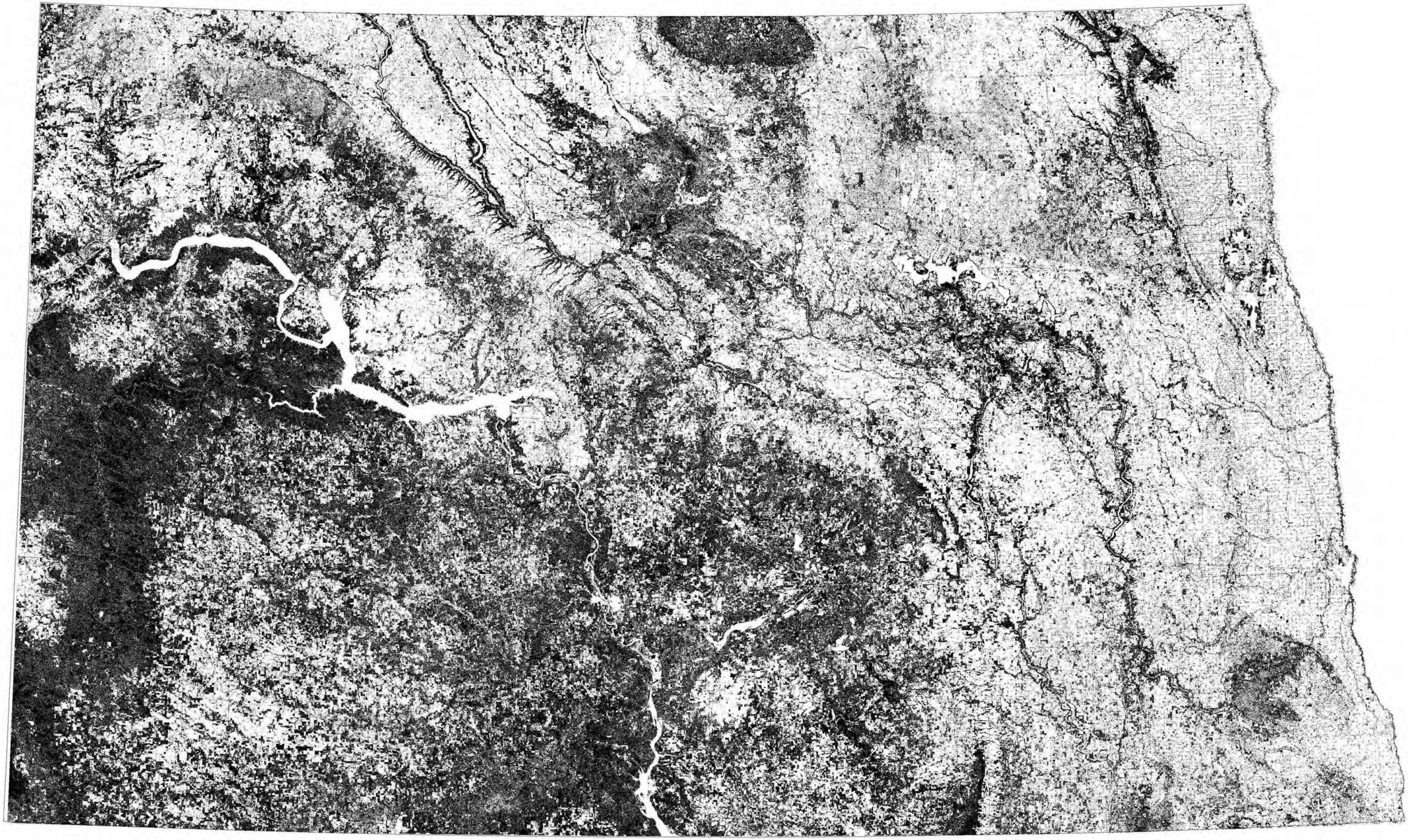
Bushy-tailed Woodrat(Neotoma cinerea)



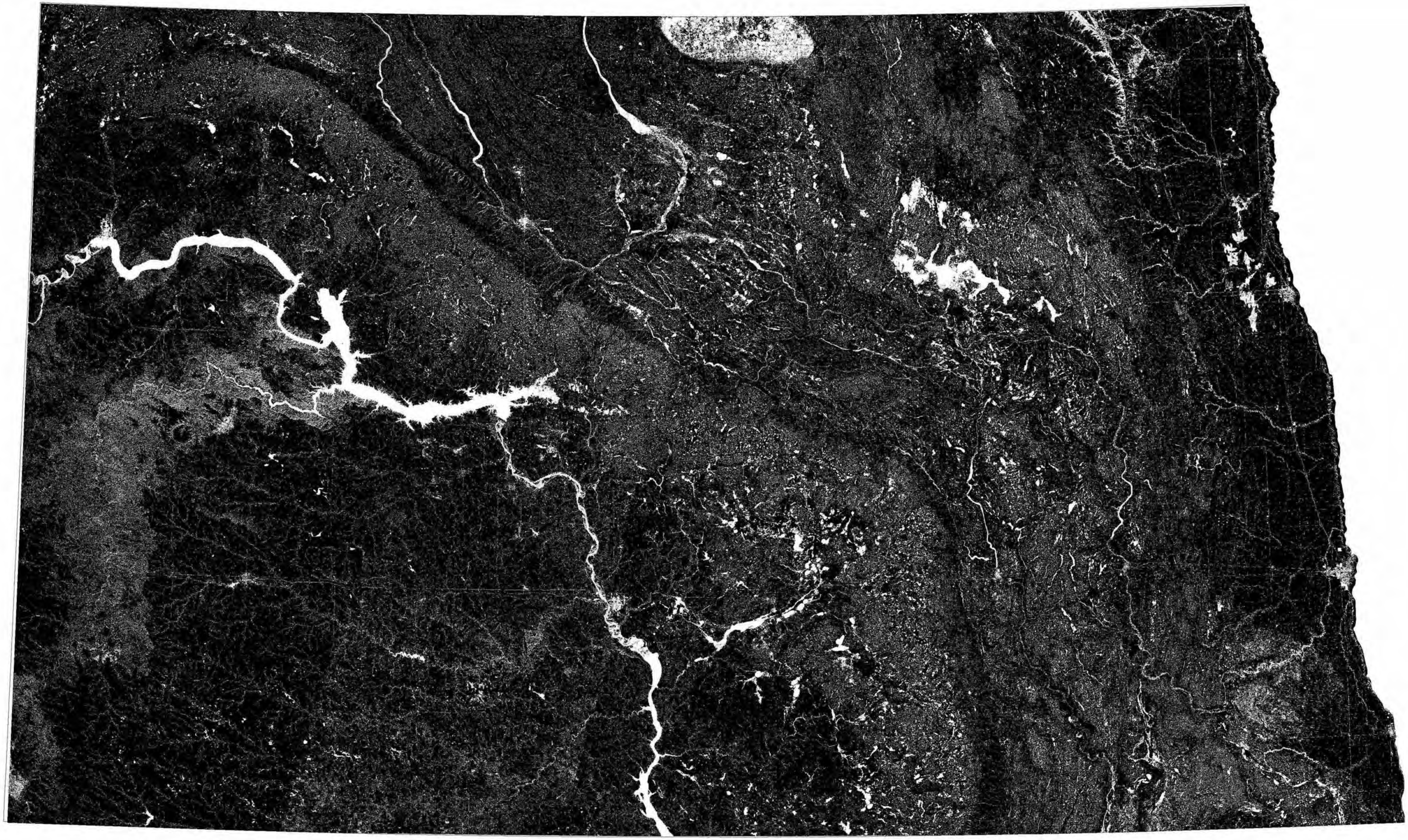
Northern Grasshopper Mouse(Onychomys leucogaster)



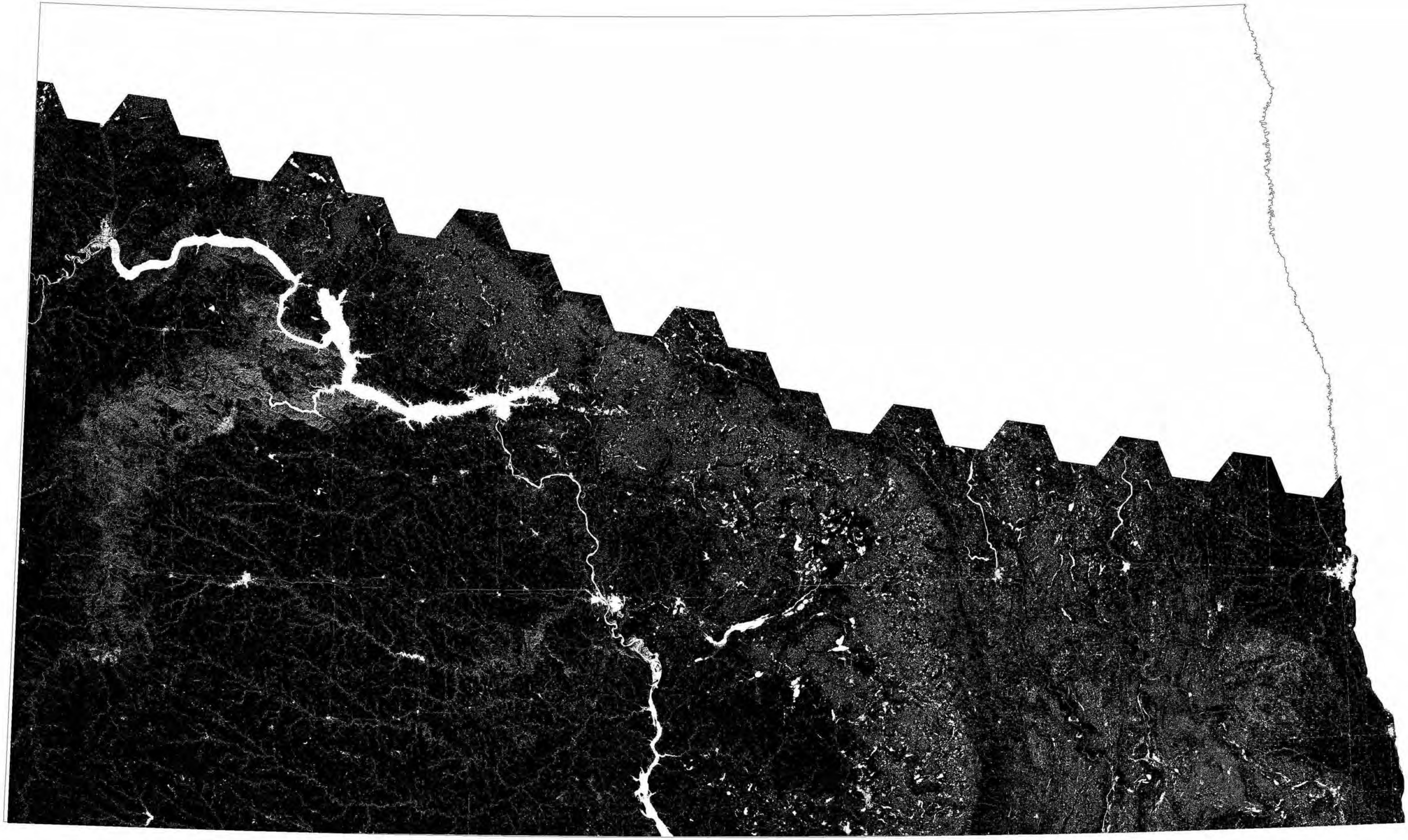
White-footed Mouse(Peromyscus leucopus)



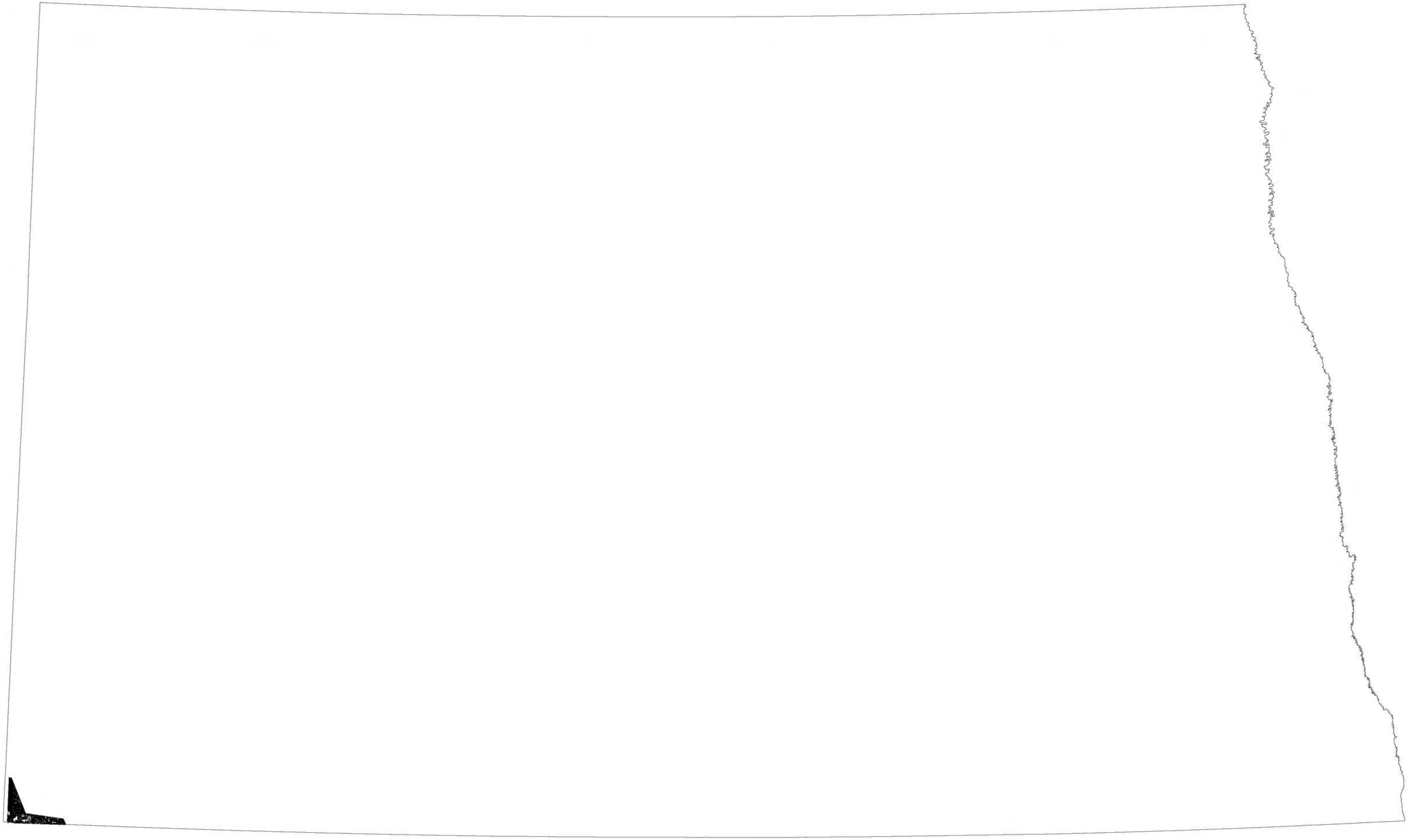
Deer Mouse(Peromyscus maniculatus)



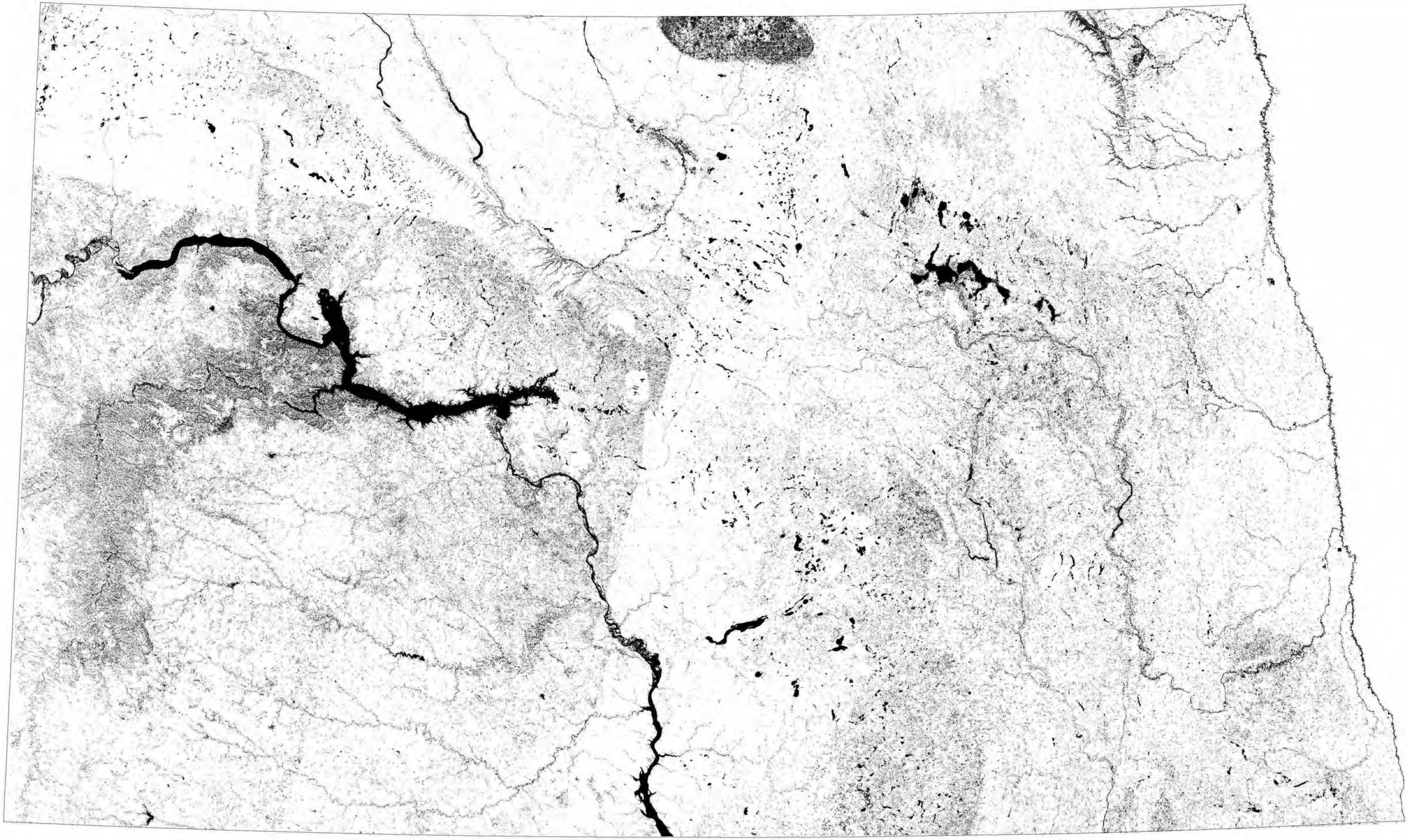
Western Harvest Mouse(Reithrodontomys megalotis)



Plains Harvest Mouse(Reithrodontomys montanus)



American Beaver(Castor Canadensis)

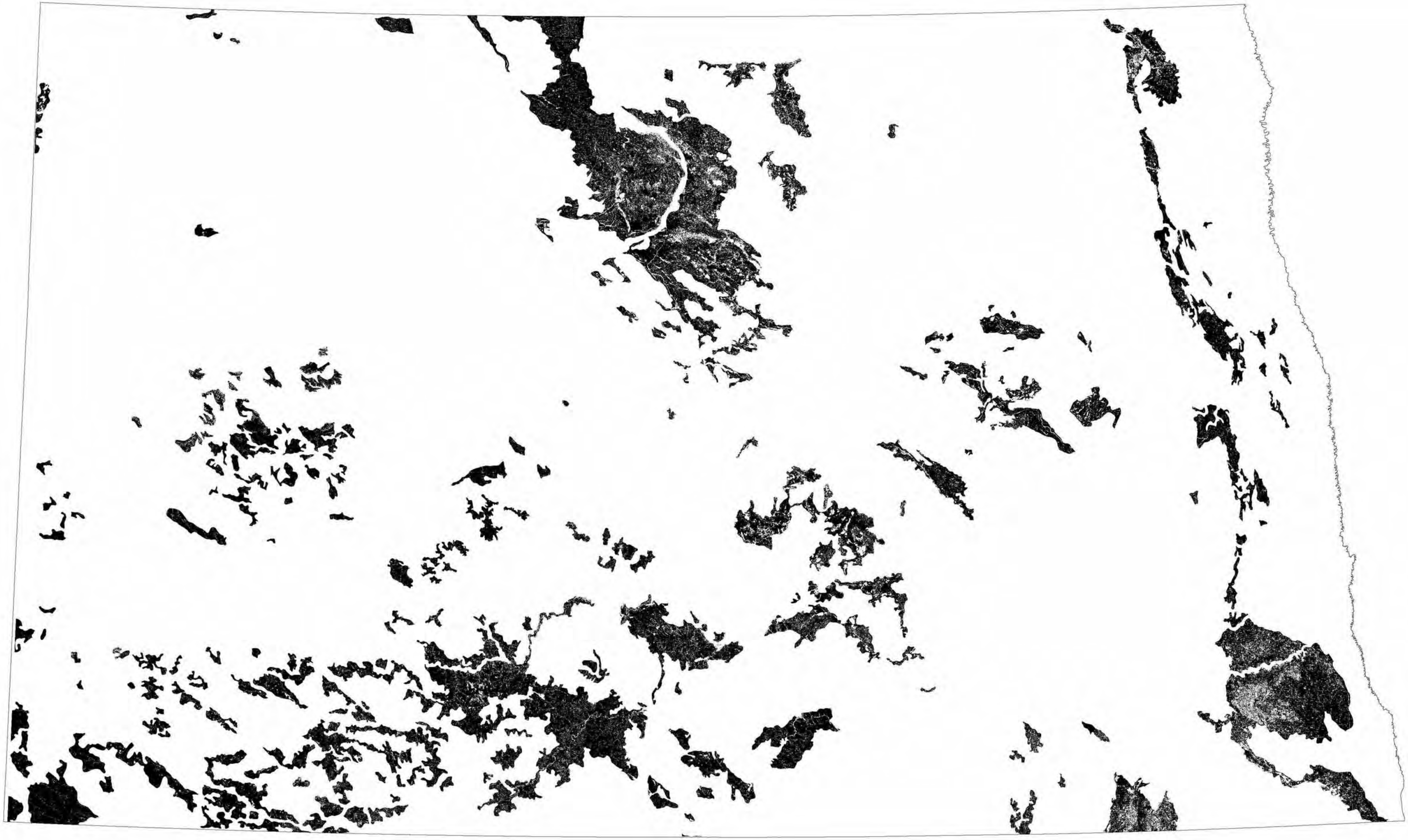


Hispid Pocket Mouse(Perognathus hispidus)

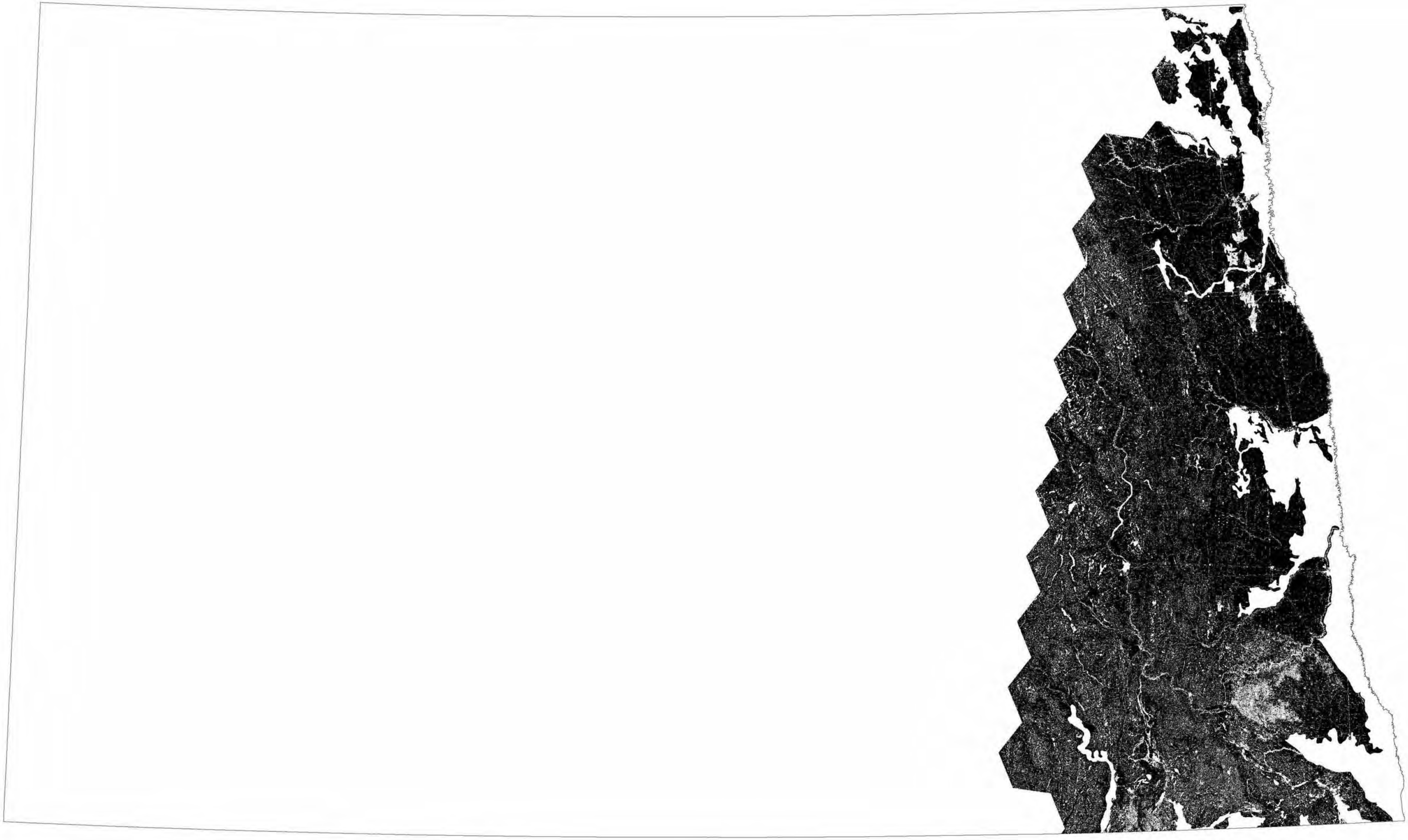
Ord's Kangaroo Rat(Dipodomys ordii)

Plains Pocket Mouse(Perognathus flavescens)

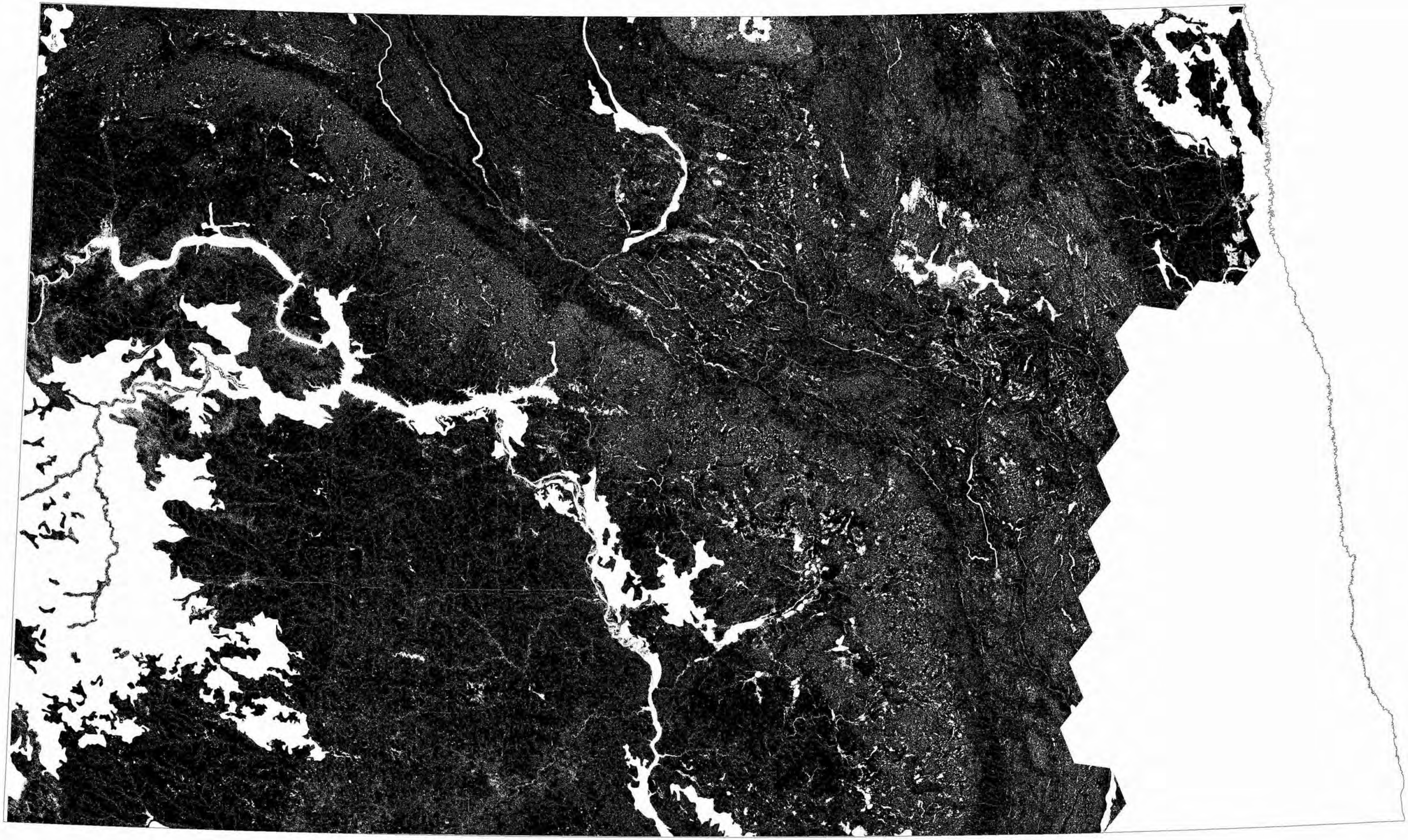
Olived-backed Pocket Mouse(Perognathus fasciatus)



Plains Pocket Gopher(Geomy bursarius)

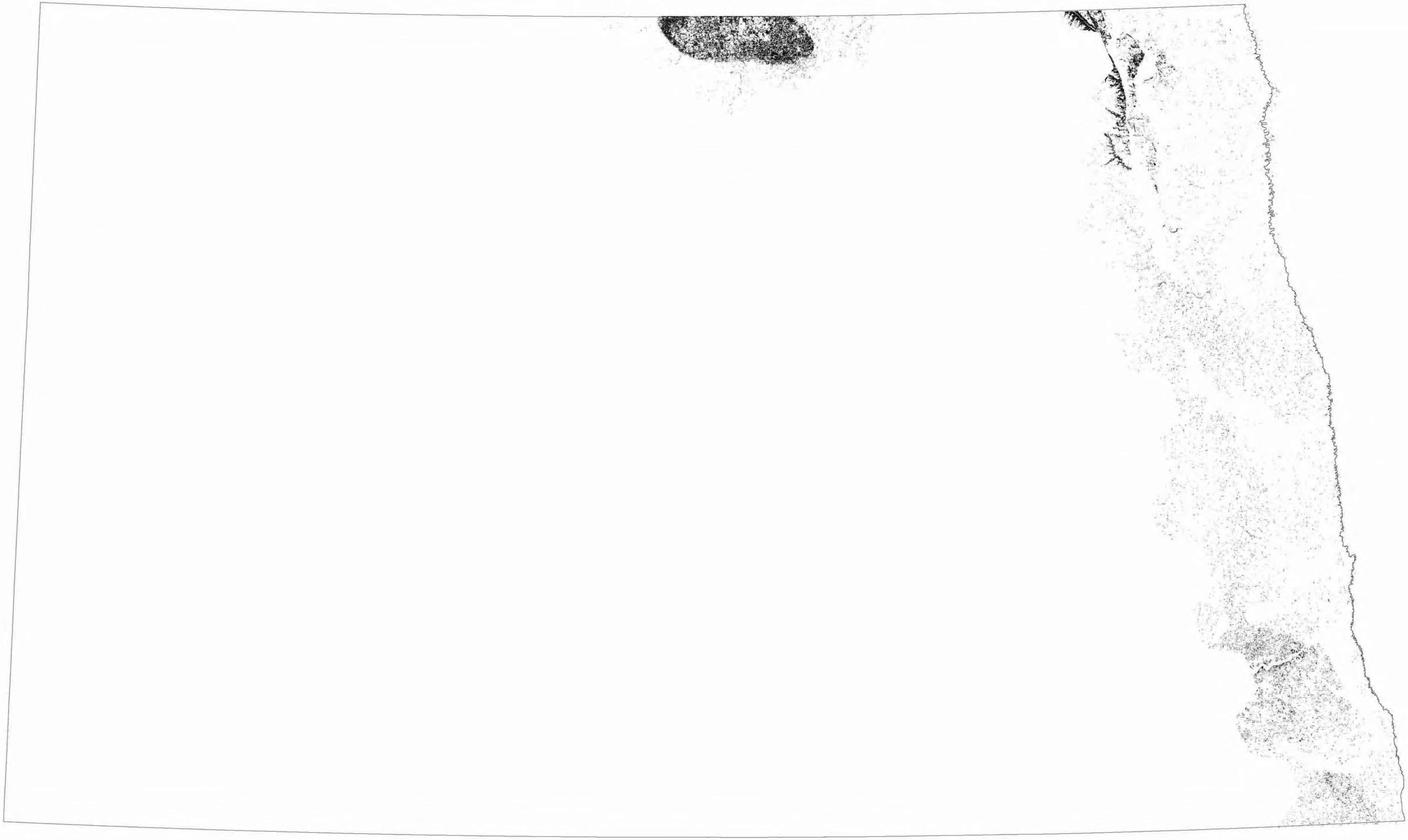


Northern Pocket Gopher(Thomomys talpoides)

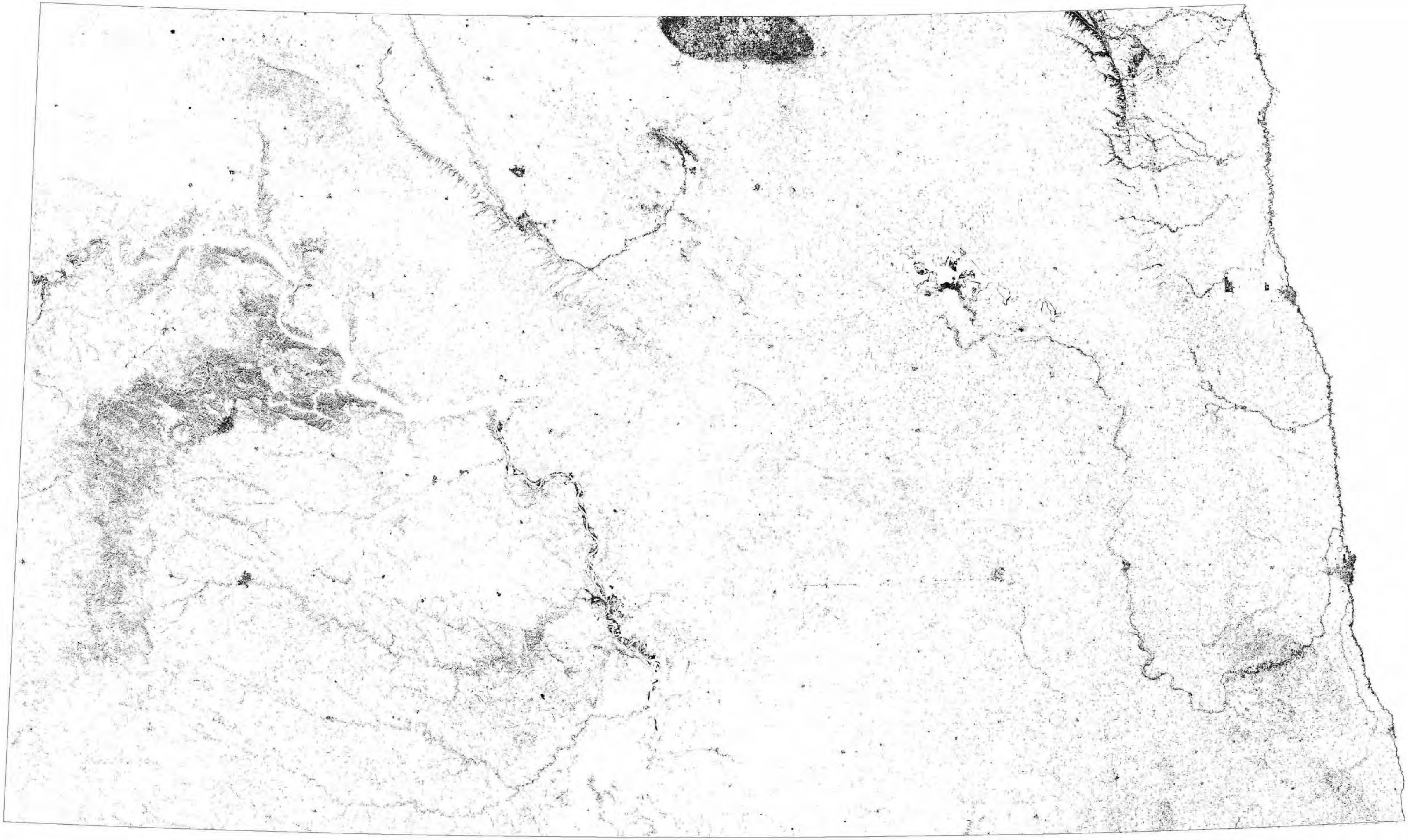


Northern Flying Squirrel(Glaucomys sabrinus)

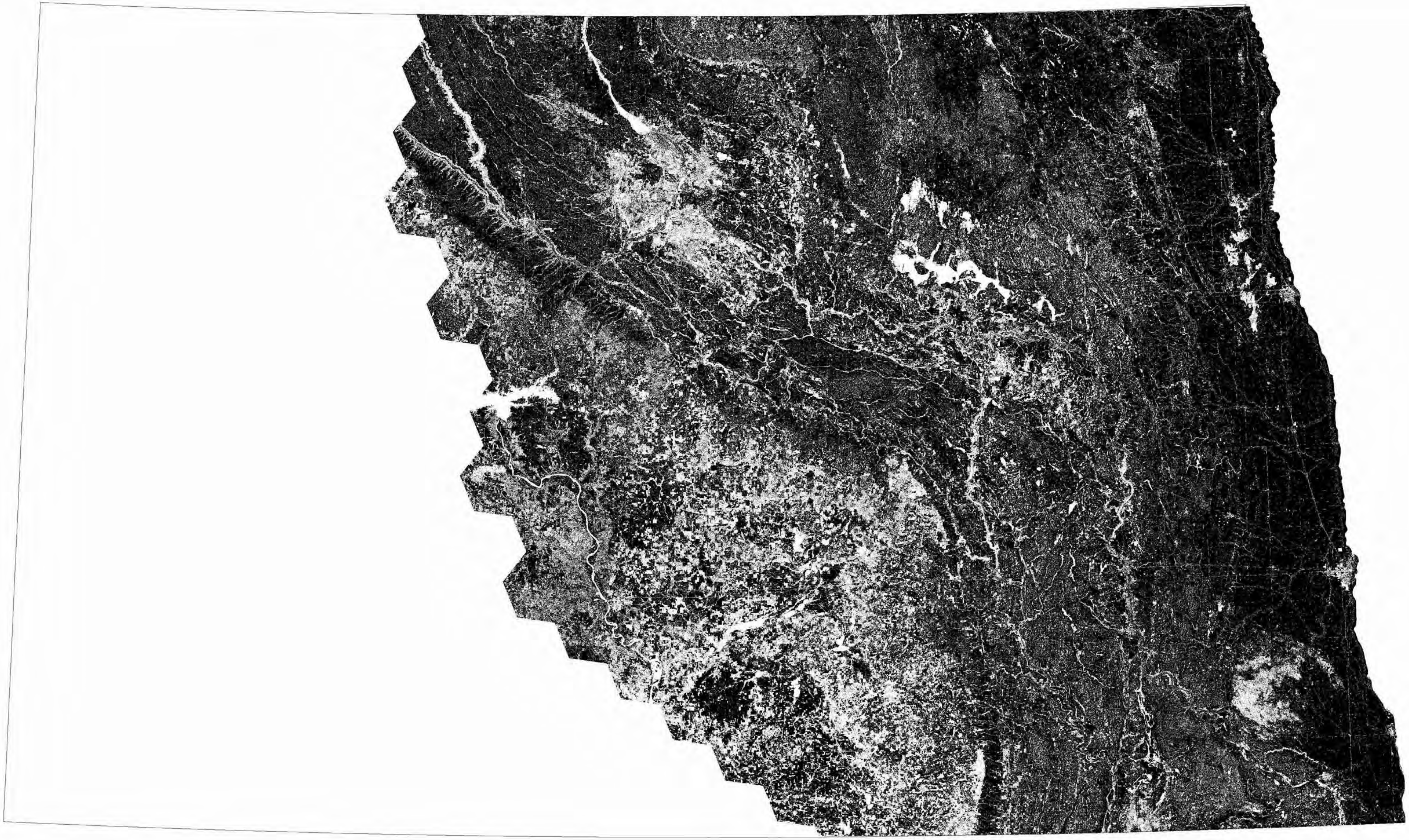
Red Squirrel(Tamiasciurus hudsonicus)



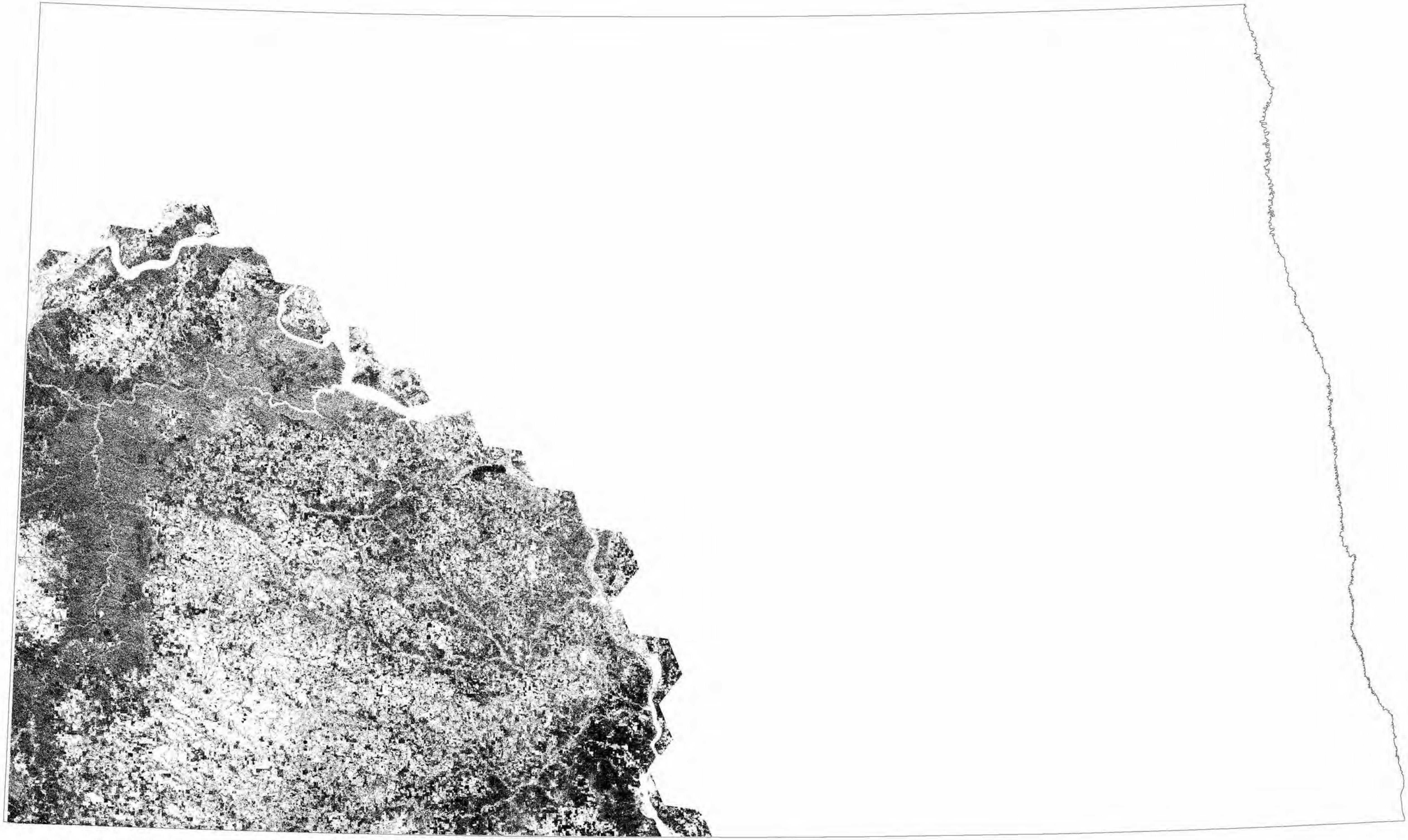
Eastern Fox Squirrel(Sciurus niger)



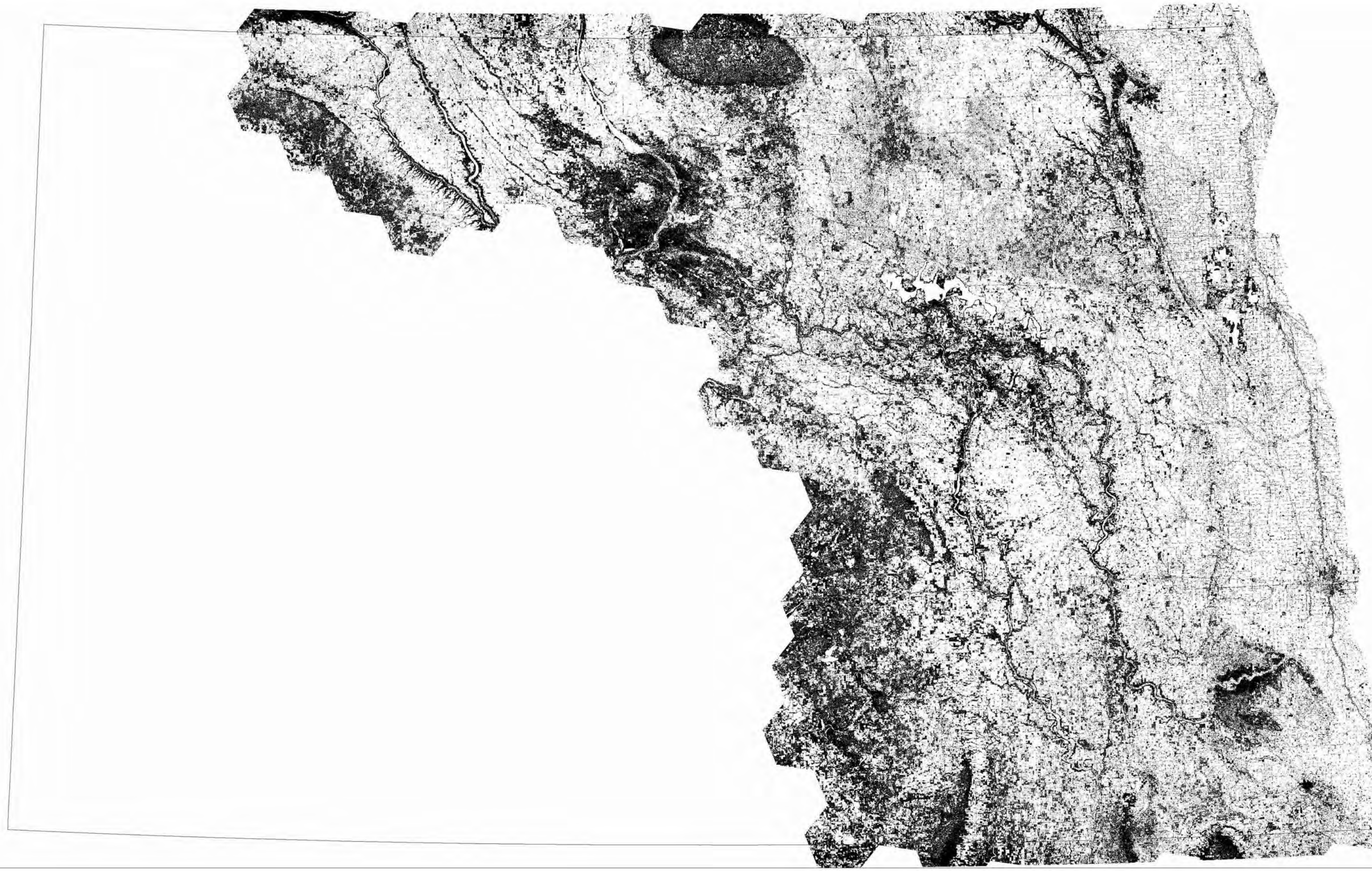
Gray Squirrel(Sciurus carolinensis)



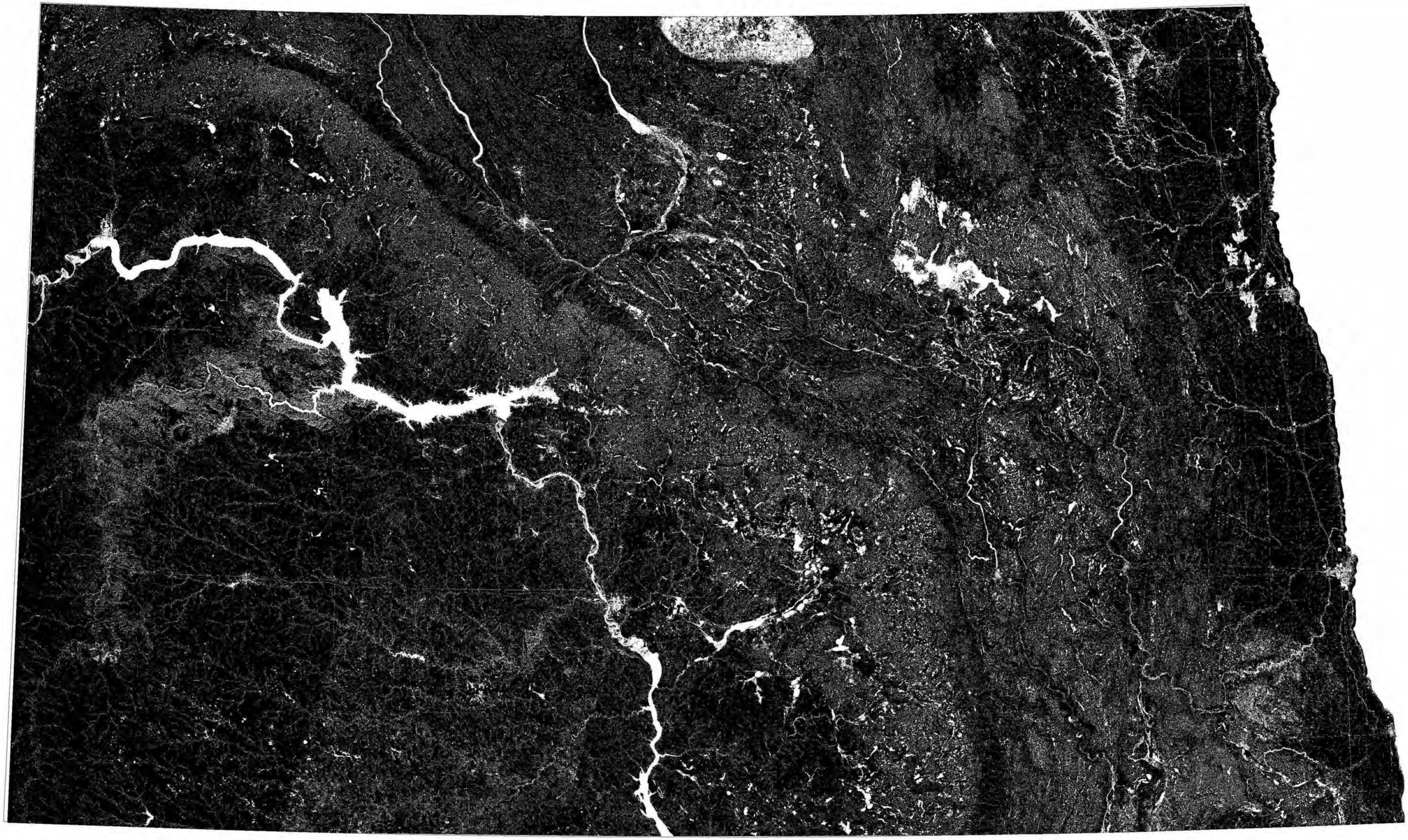
Black-tailed Prairie Dog(Cynomys ludovicianus)



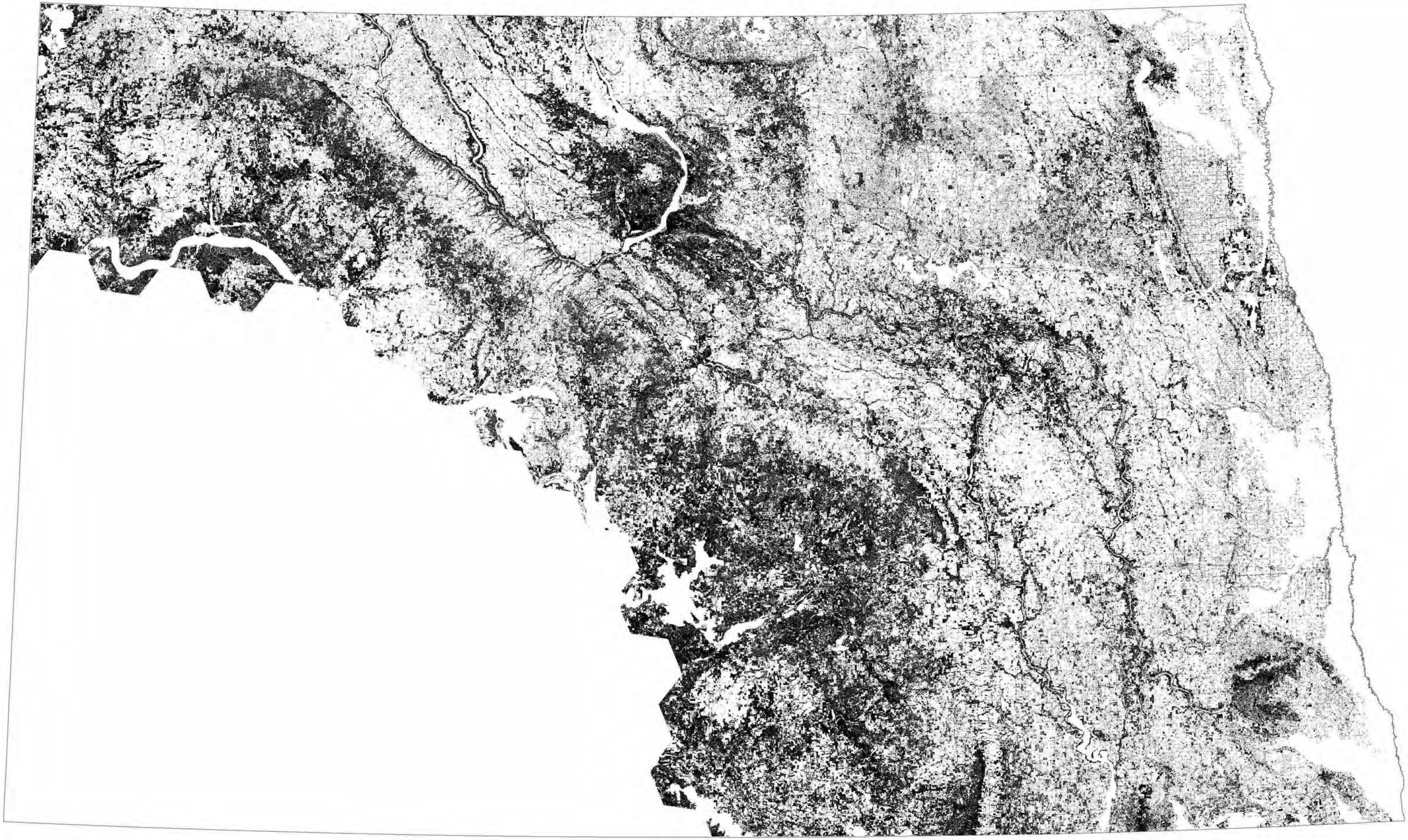
Franklin's Ground Squirrel(Spermophilus franklinii)



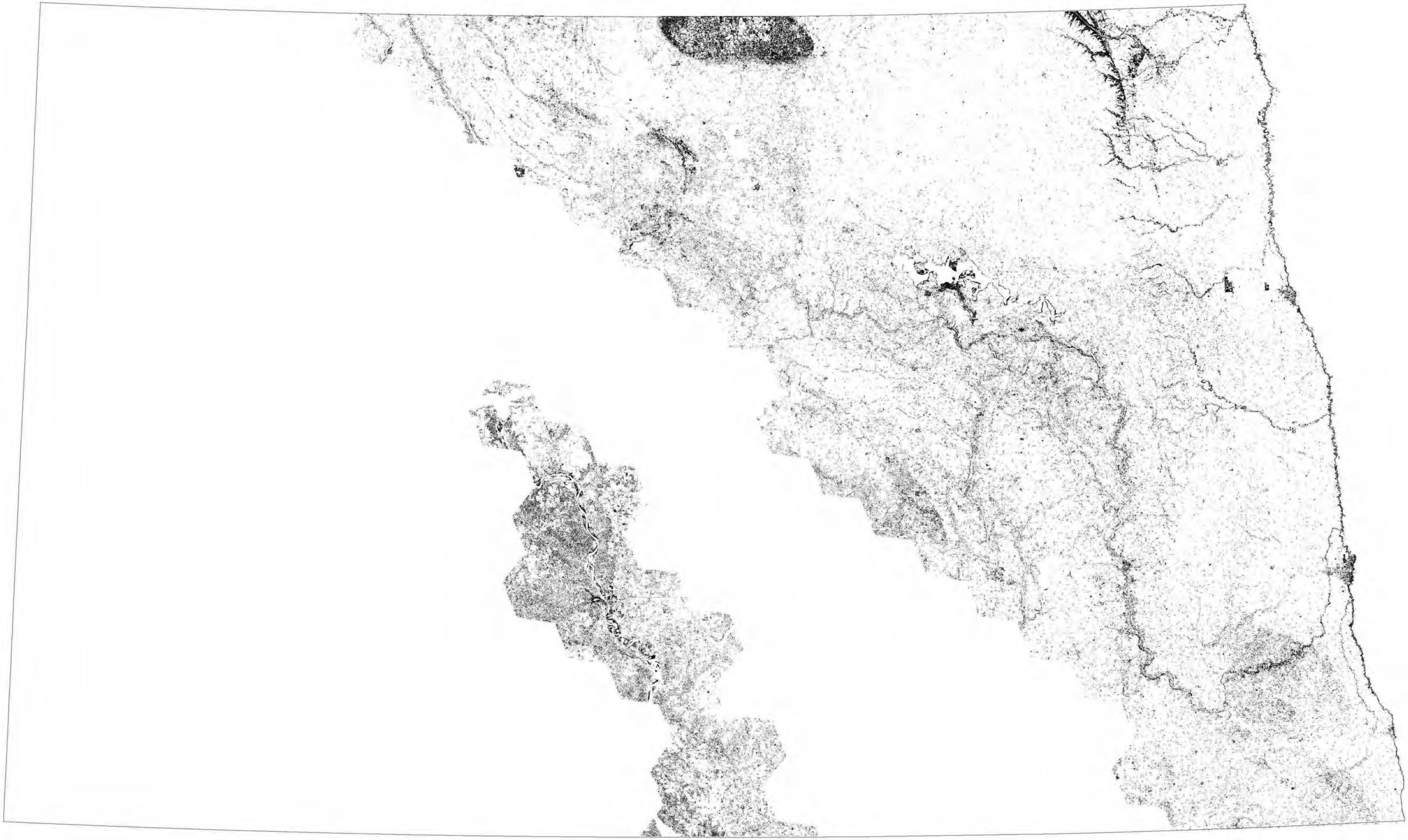
Thirteen-lined Ground Squirrel(Spermophilus tridecemlineatus



Richardson's Ground Squirrel(Spermophilus richardsonii)



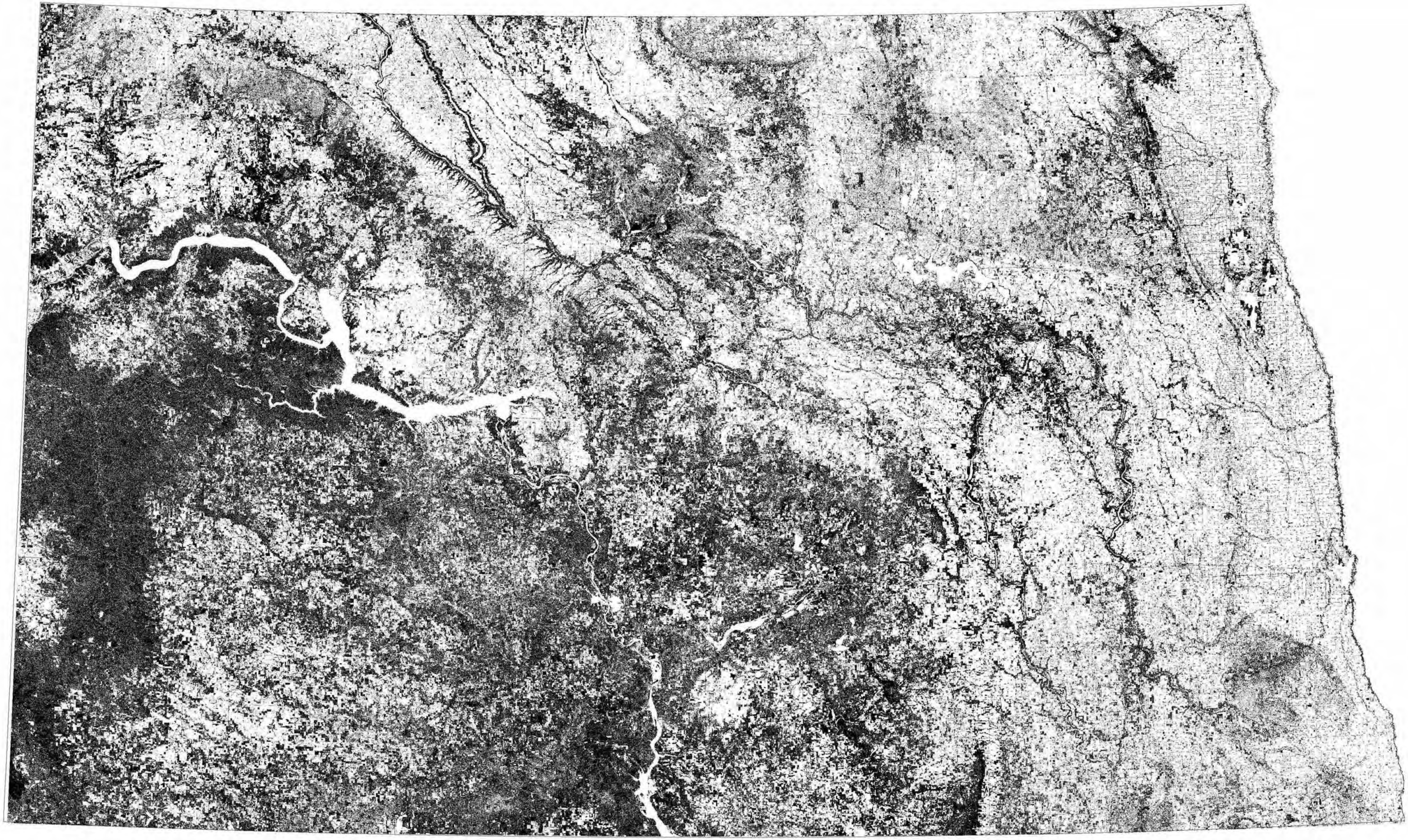
Woodchuck(Marmota monax)



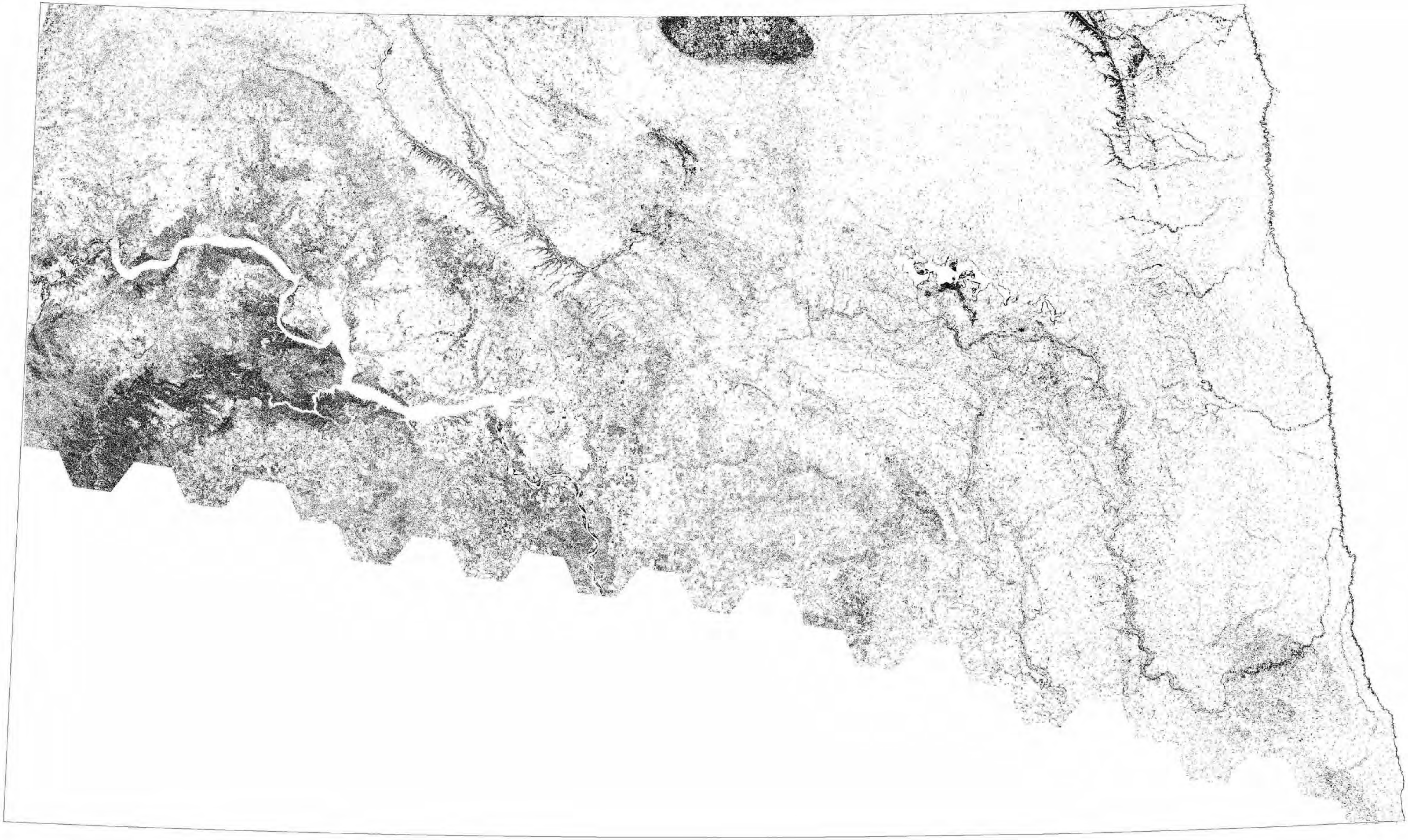
Eastern Chipmunk(Tamias striatus)

Least Chipmunk(Eutamius minimus)

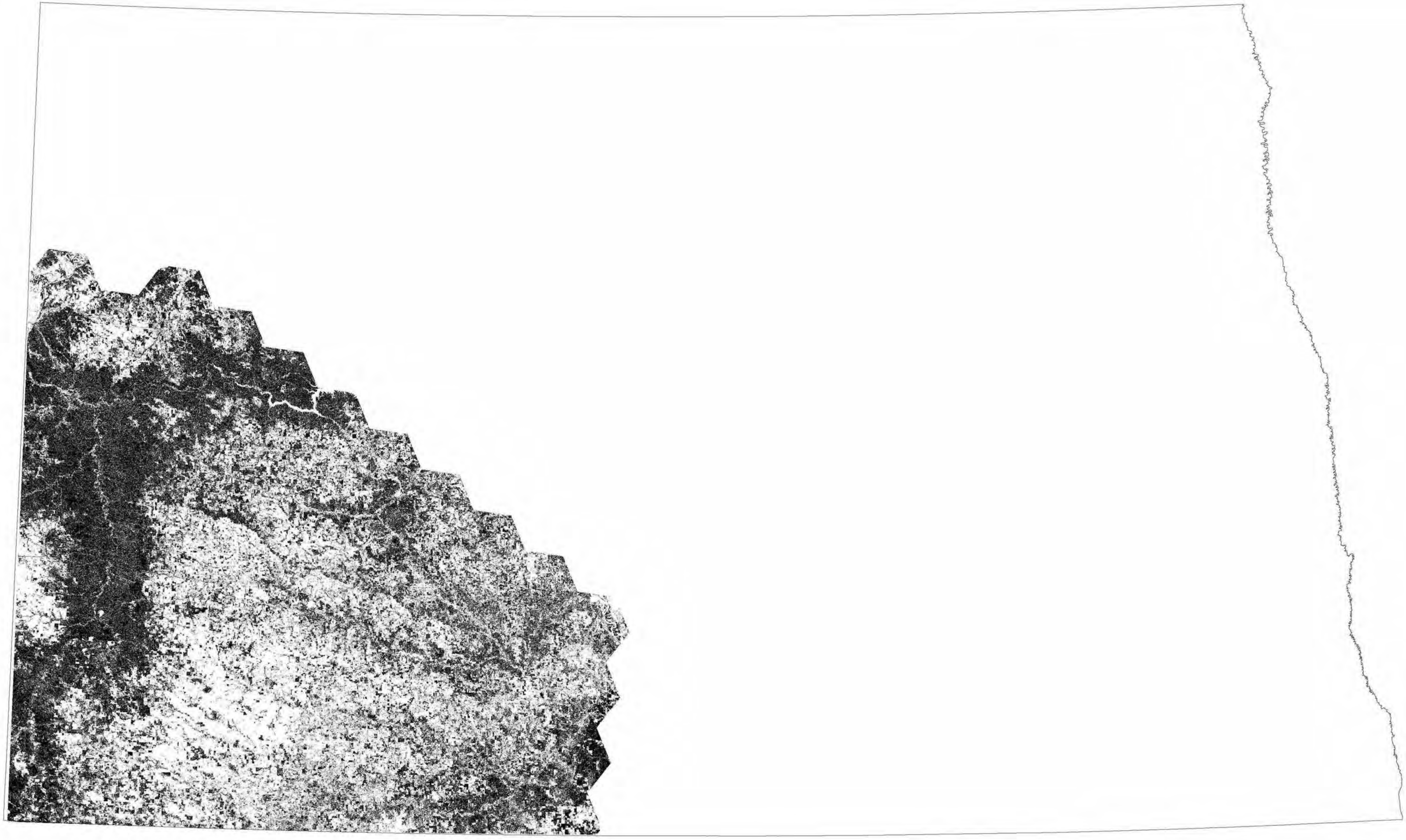
White-tailed Jack Rabbit(Lepus townsendii)



Snowshoe Hare(Lepus americanus)

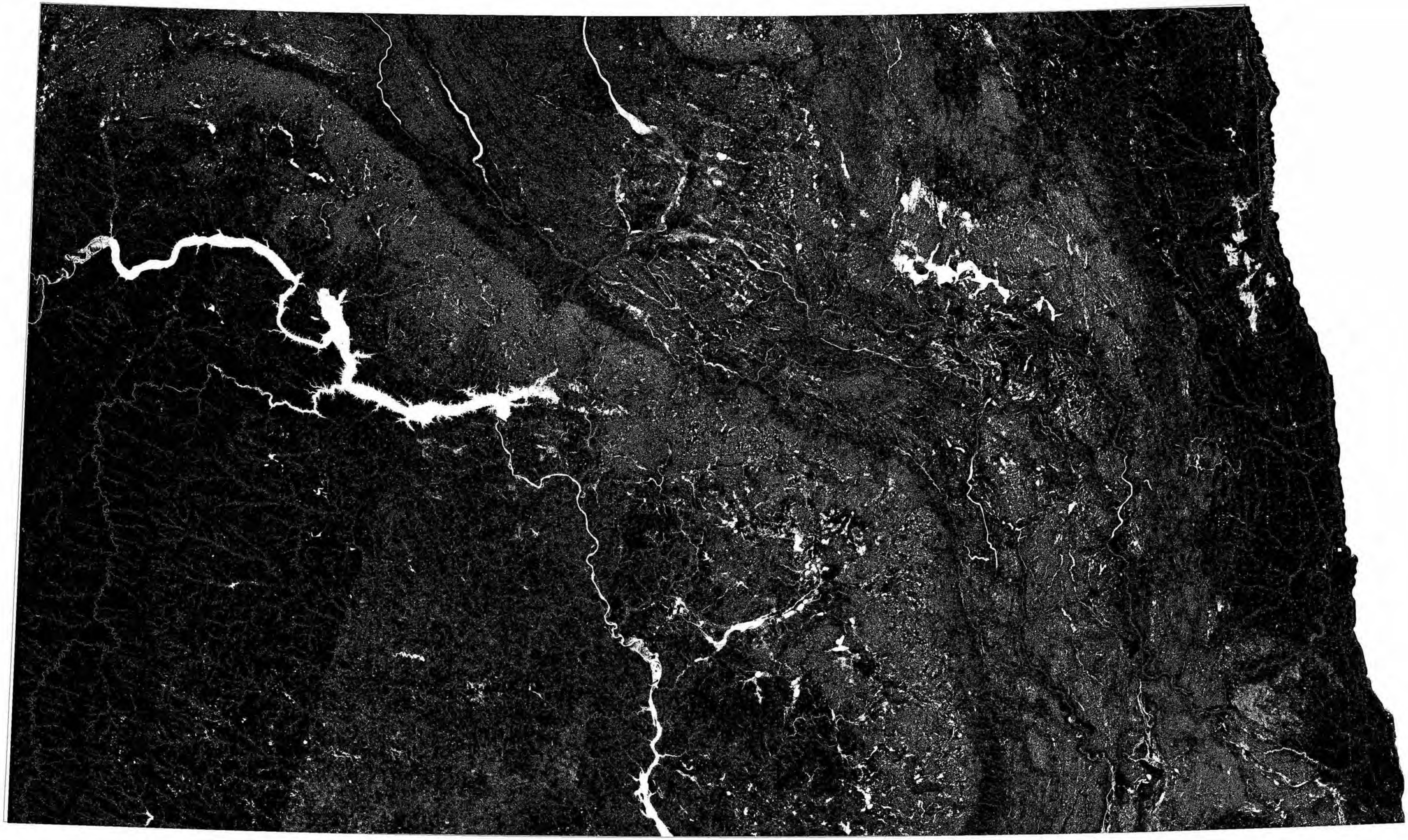


Desert Cottontail(Sylvilagus audubonii)

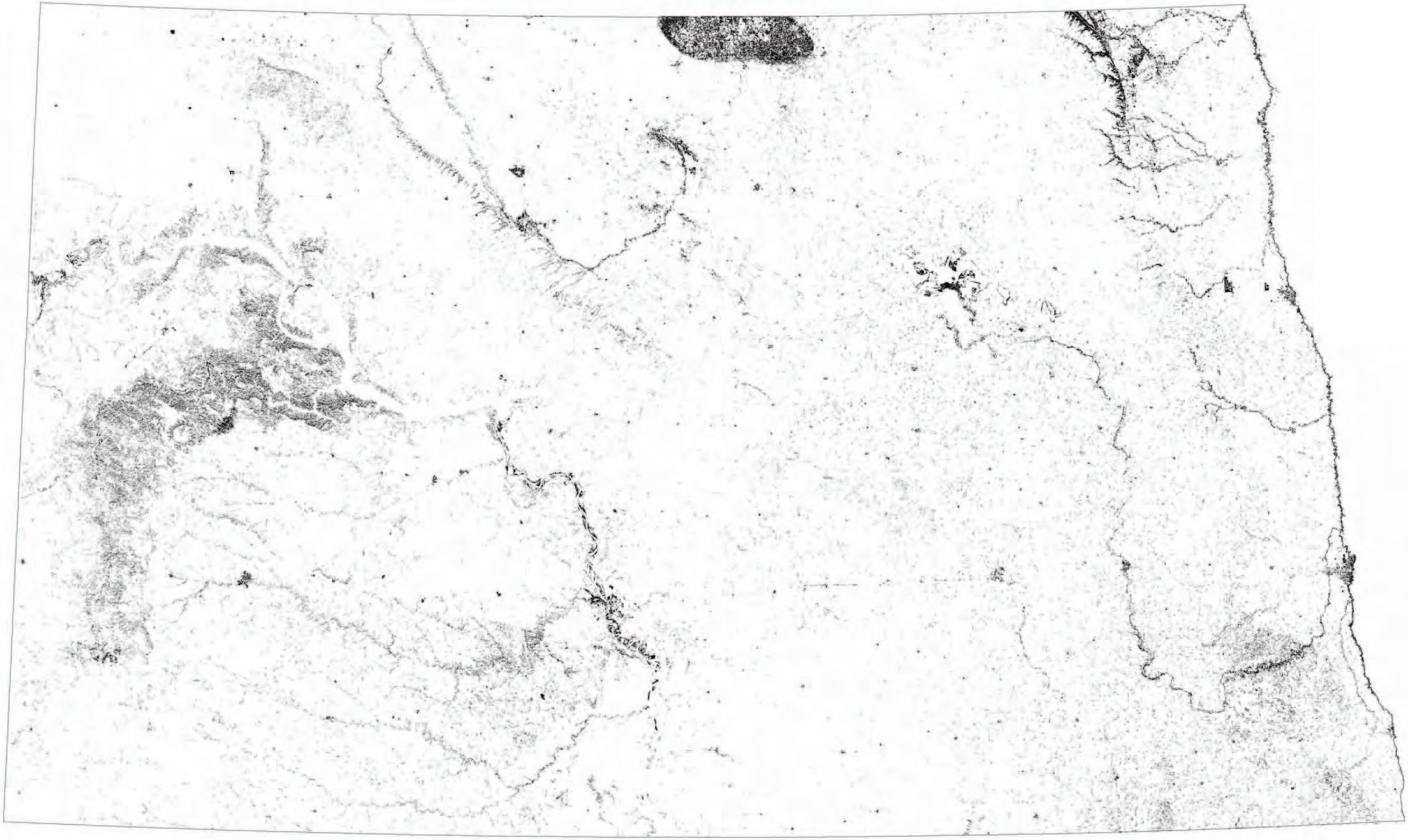


Nuttall's Cottontail(Sylvilagus nuttallii)

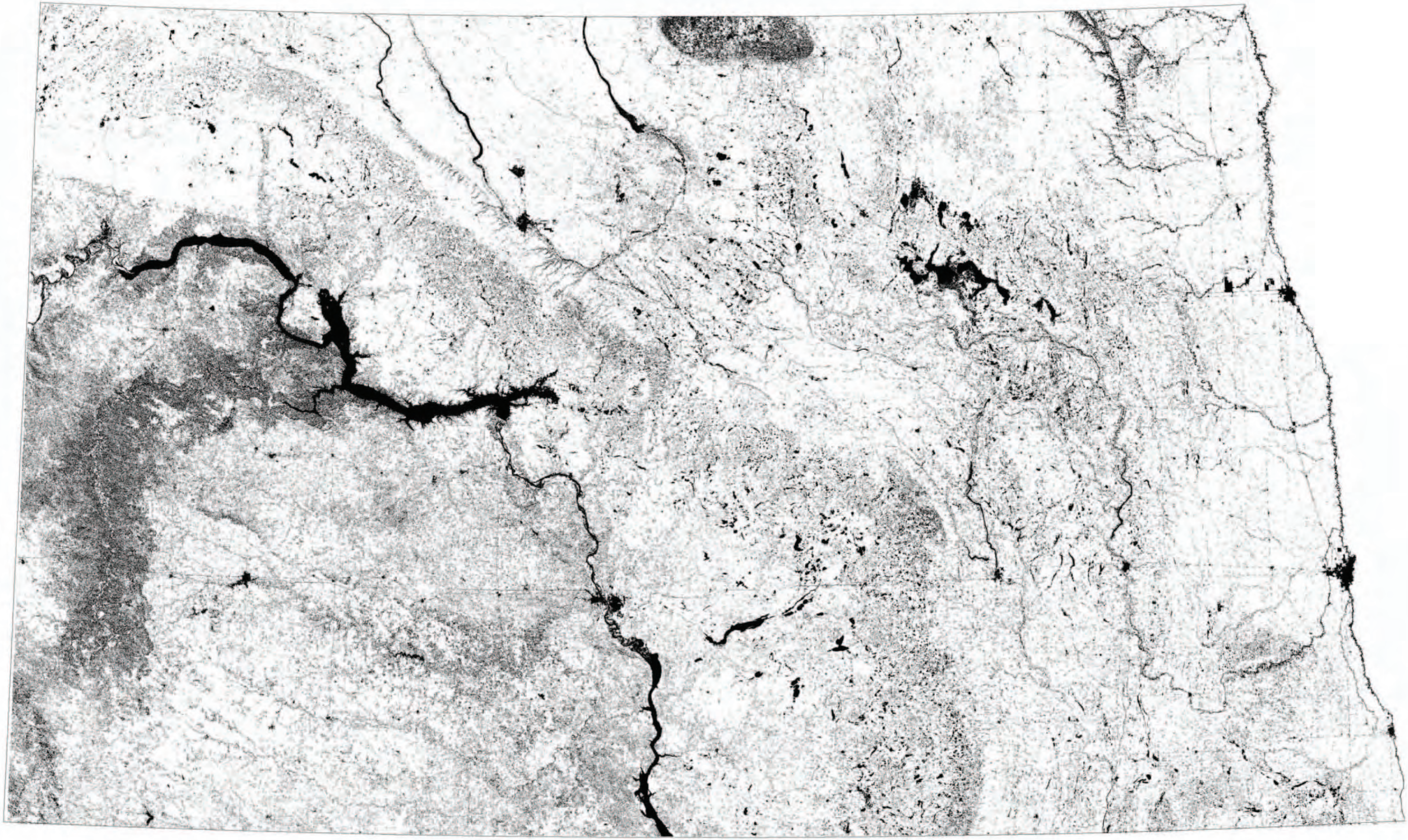
Eastern Cottontail(Sylvilagus floridanus)



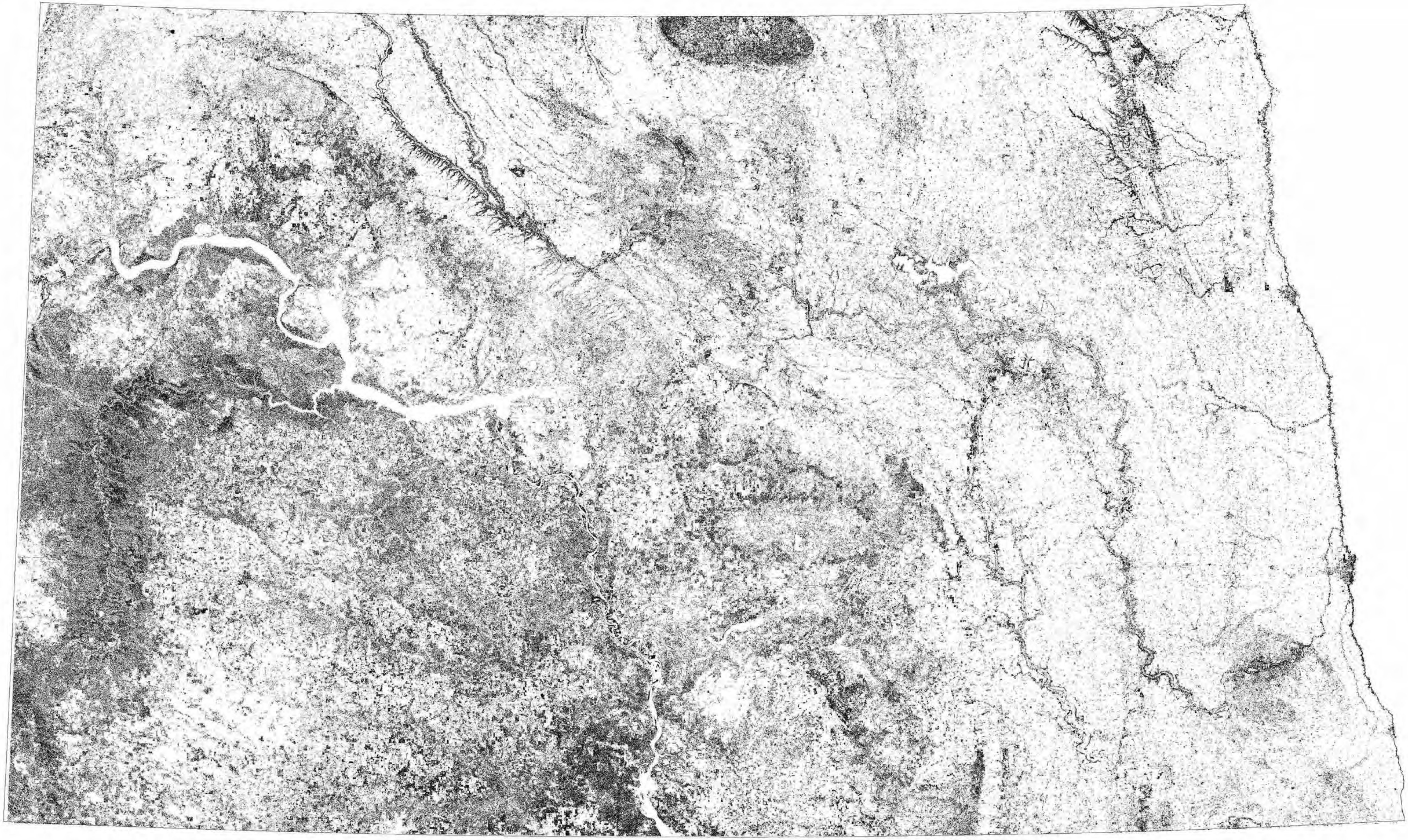
Hoary Bat (Lasiurus cinereus)



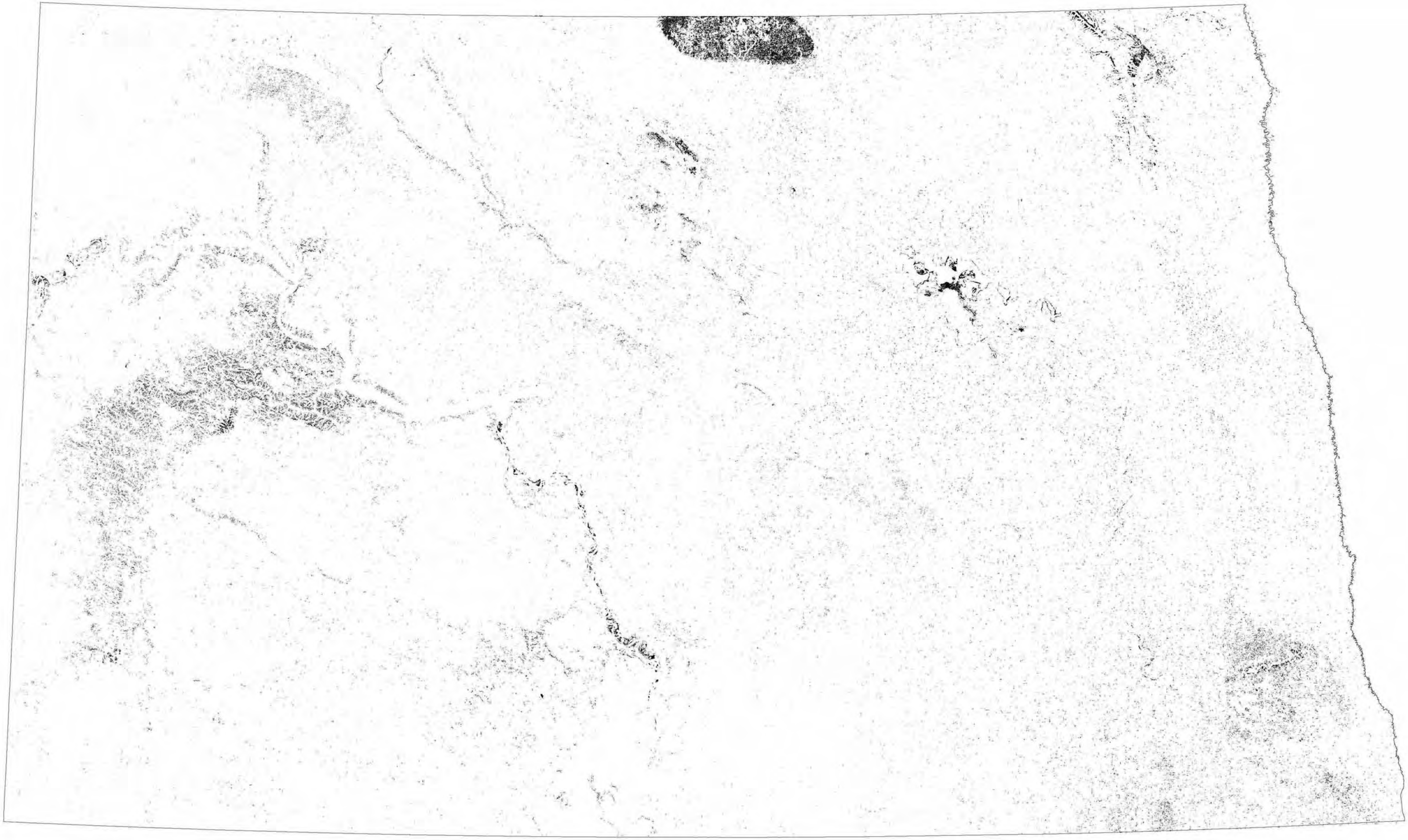
Eastern Red Bat(Lasiurus borealis)



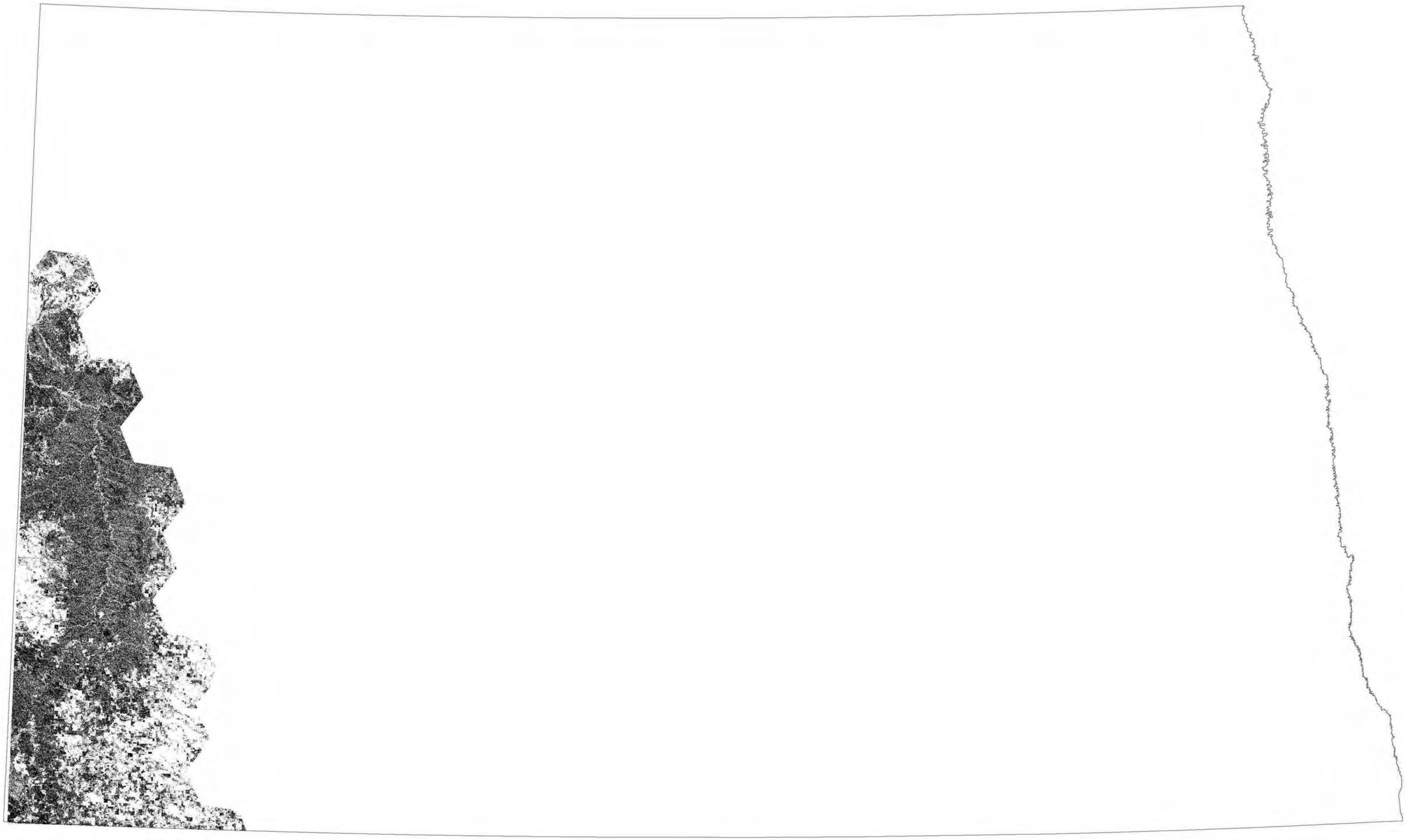
Big Brown Bat(Eptesicus fuscus)



Silver-haired Bat(Lasionycteris noctivagans)



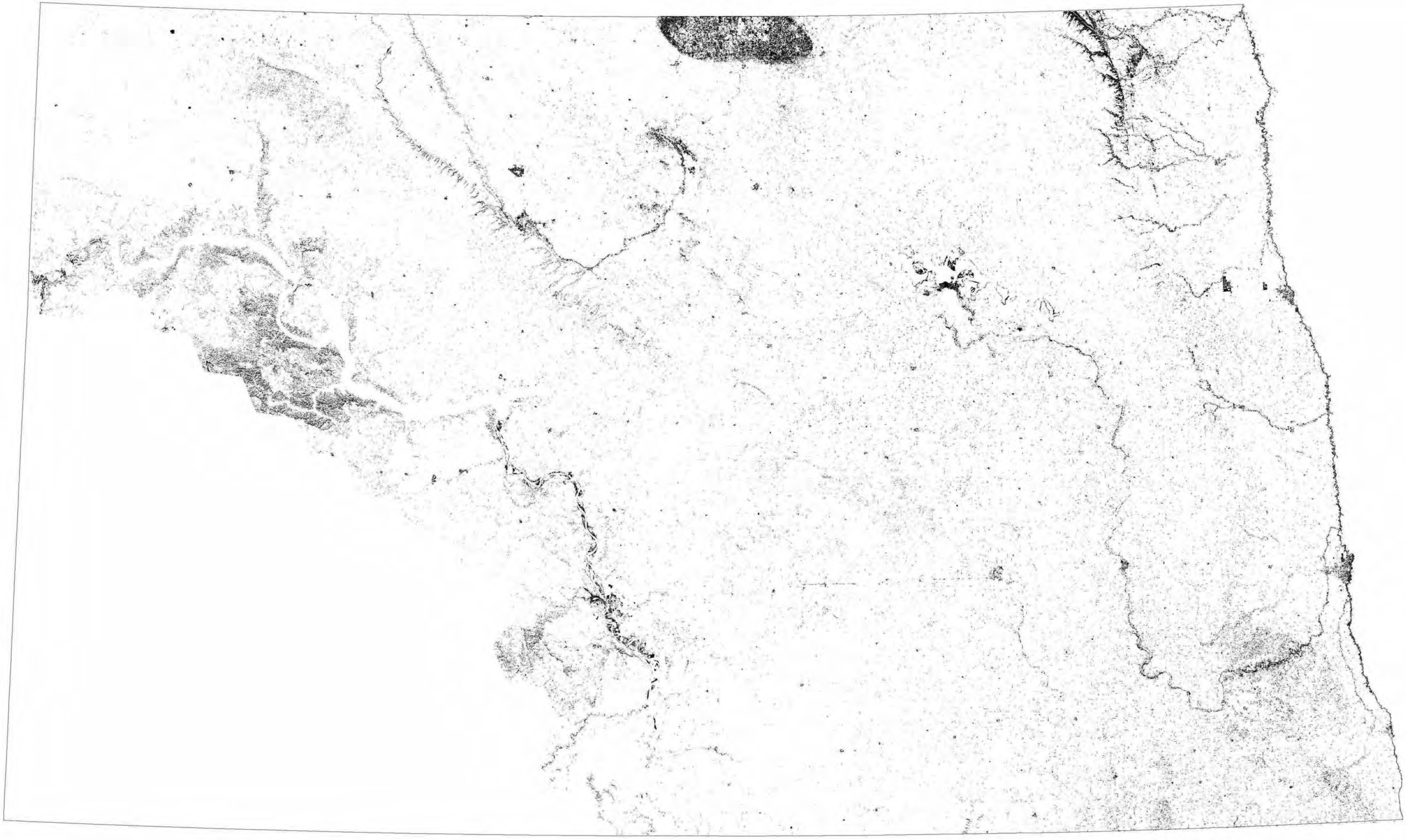
Small-footed Myotis(Myotis leibii)



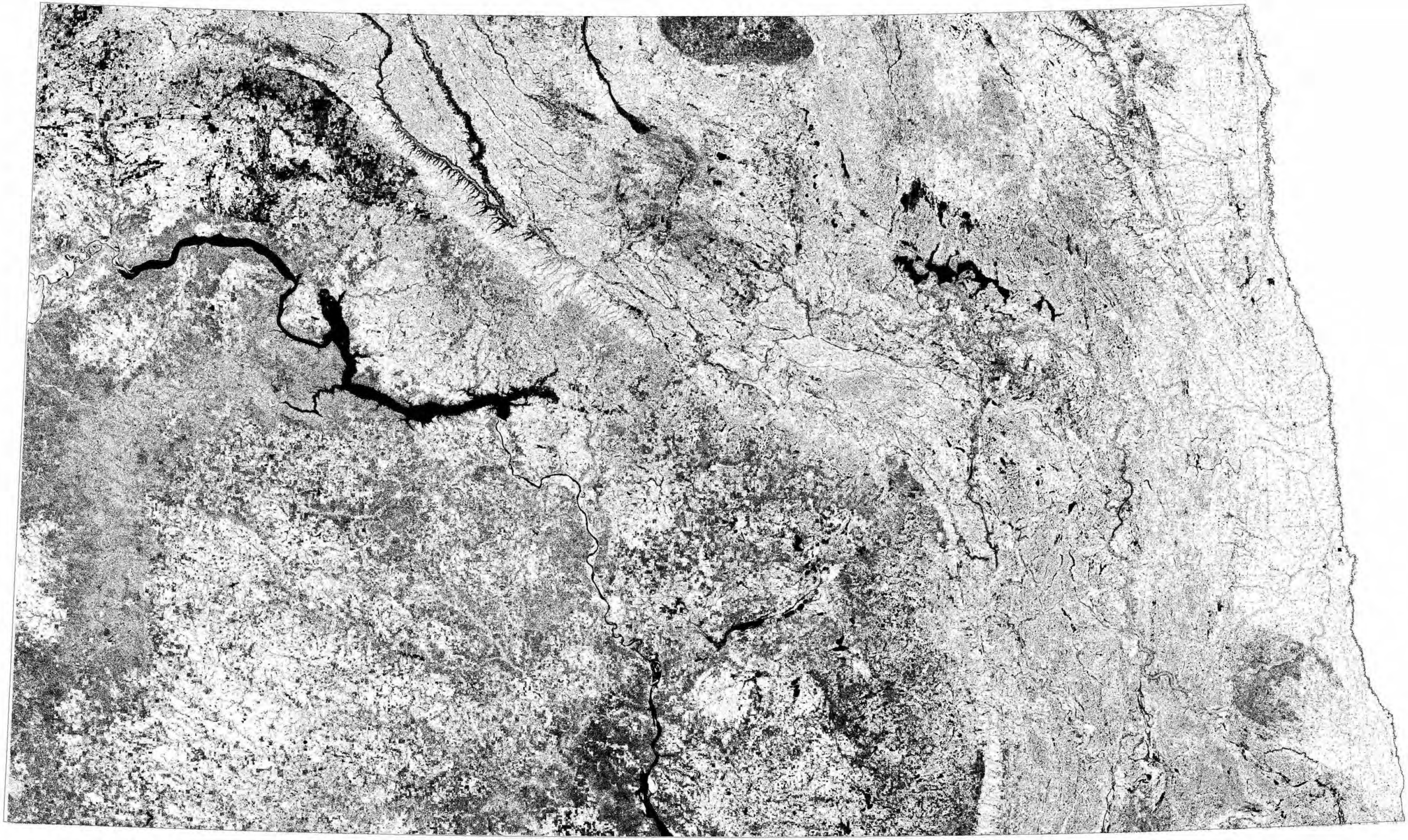
Long-legged Myotif(Myotis volans)

Long-eared Myotis(Myotis evotis)

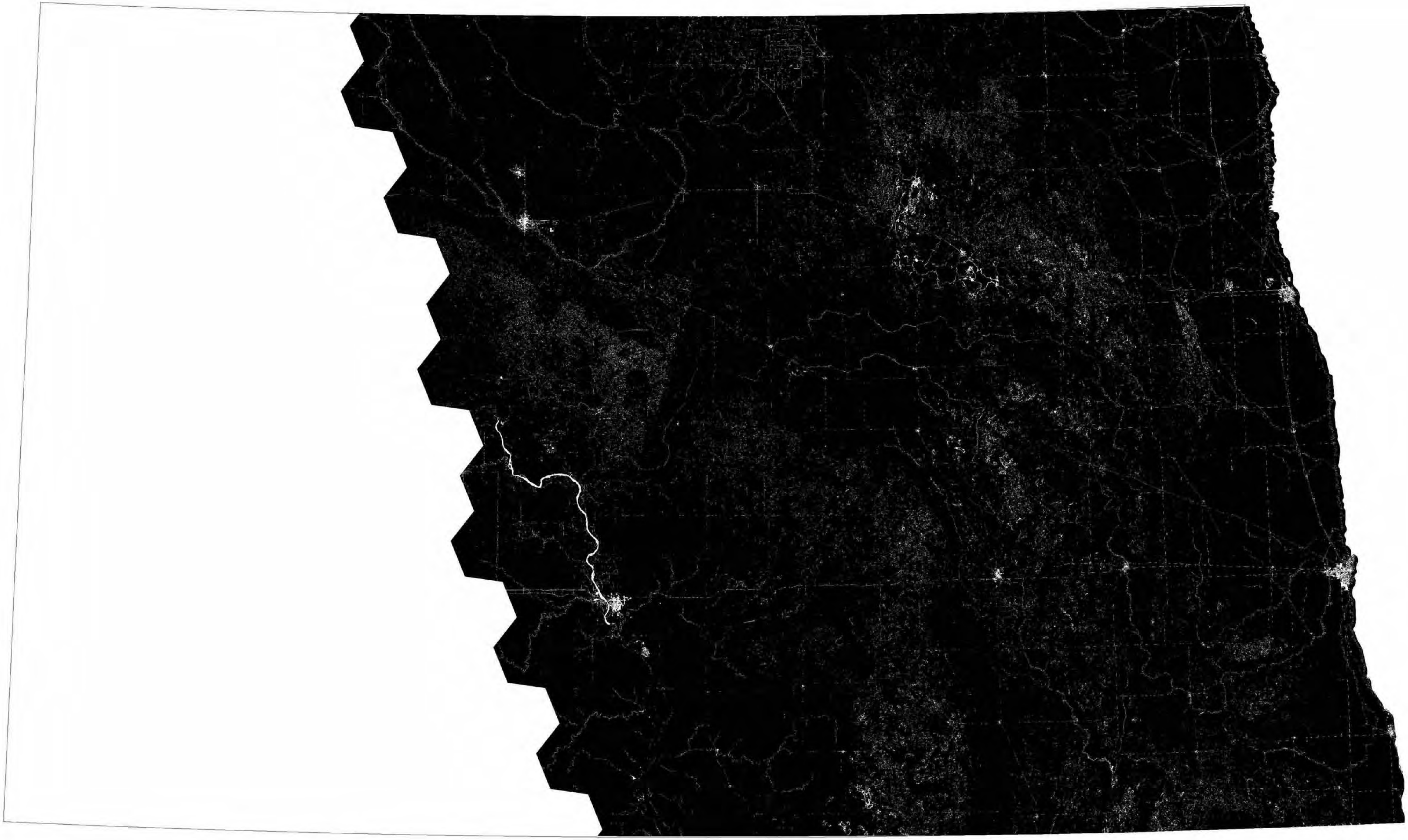
Keen's Myotis(Myotis keenii)



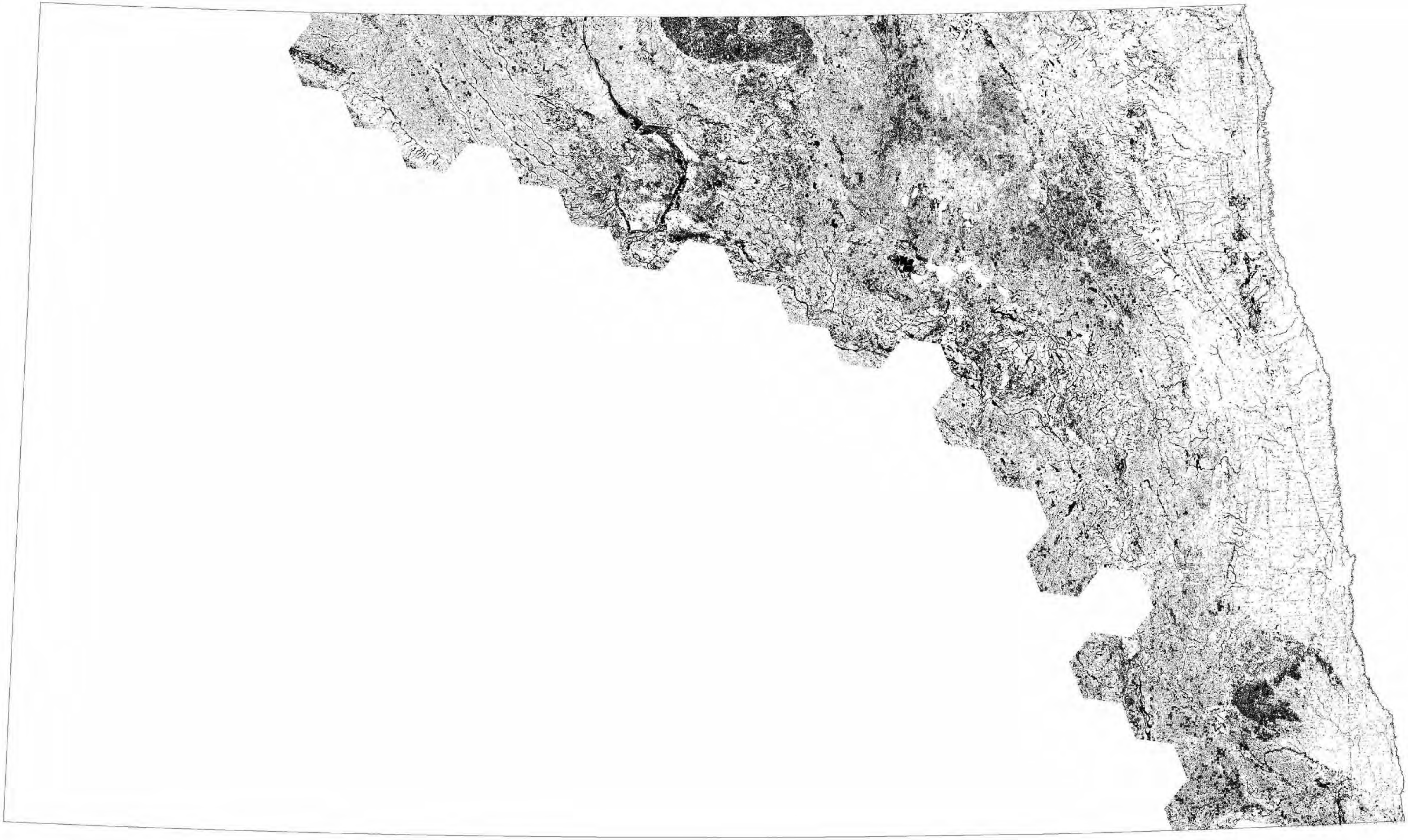
Little Brown Bat(Myotis lucifugus)



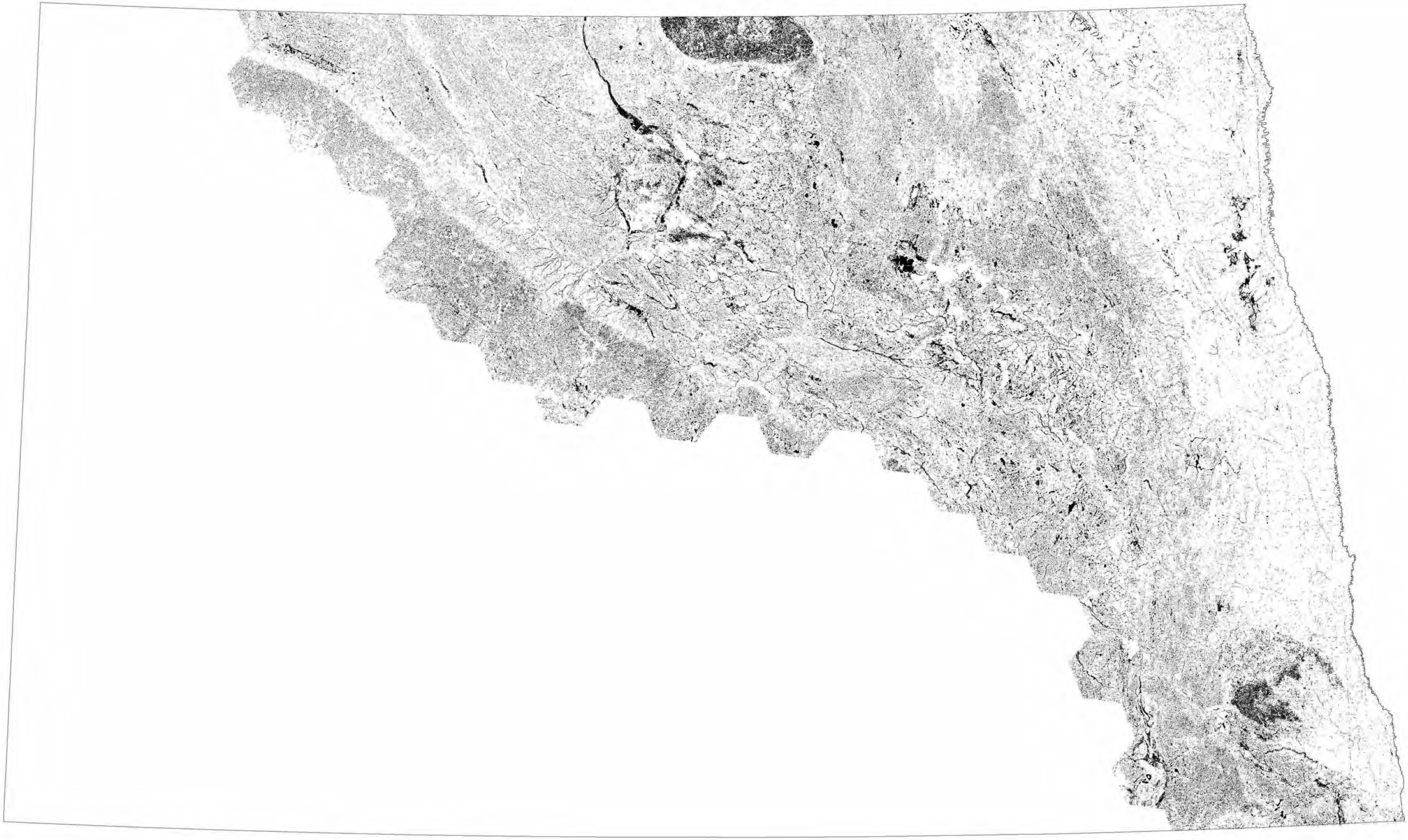
Northern Short-tailed Shrew(Blarina brevicauda)



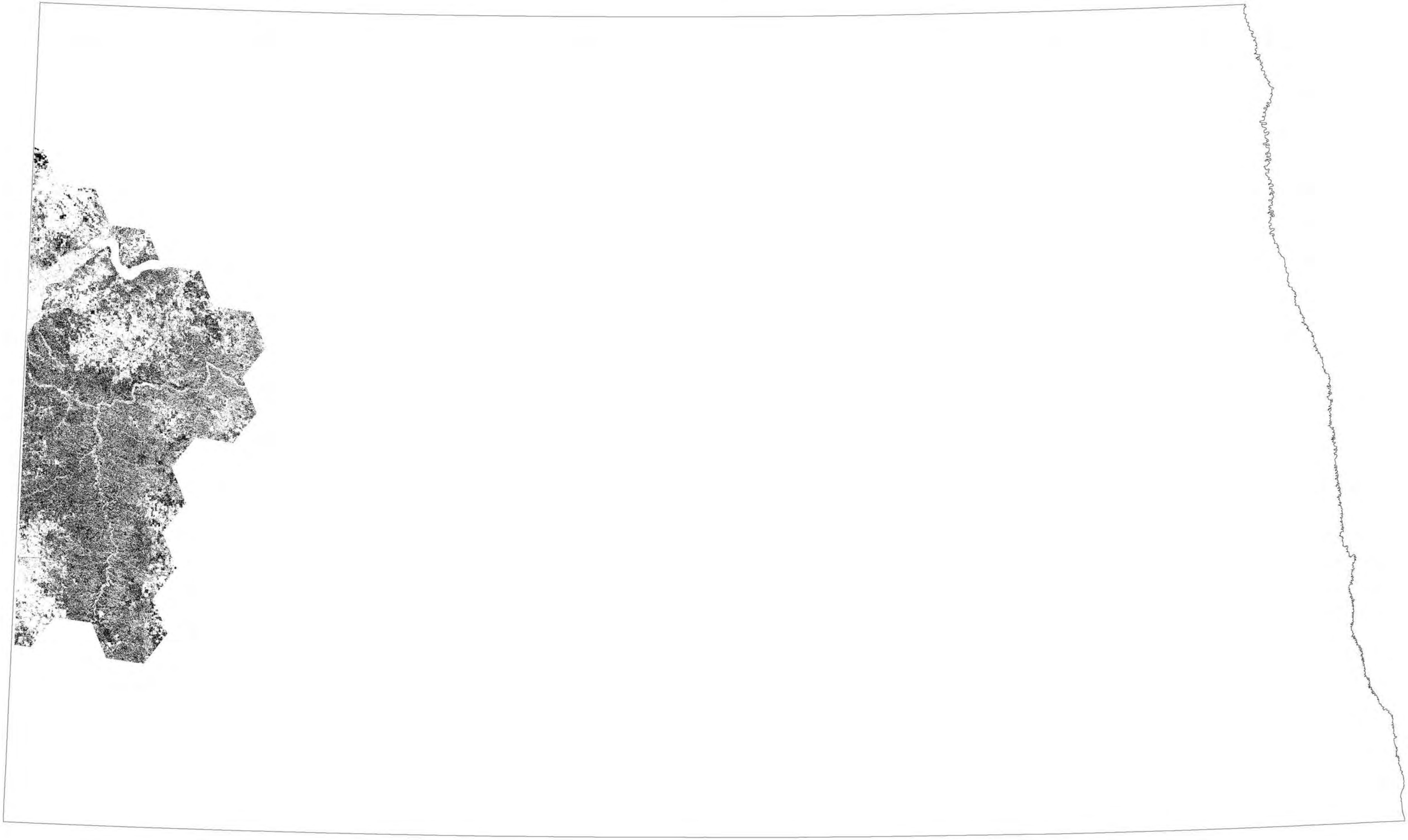
Pigmy Shrew(Microsorex hoyi)



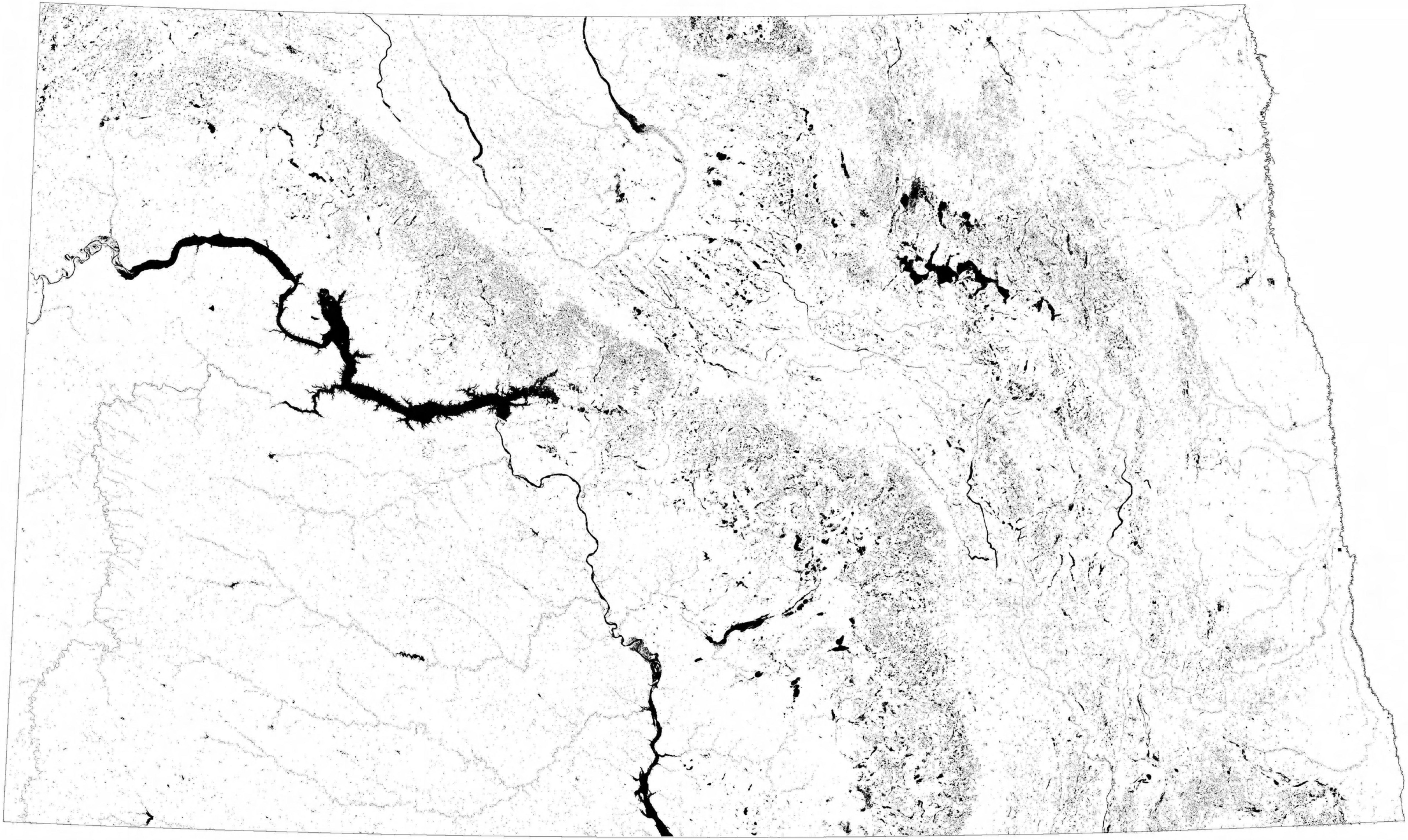
Arctic Shrew(Sorex articus)



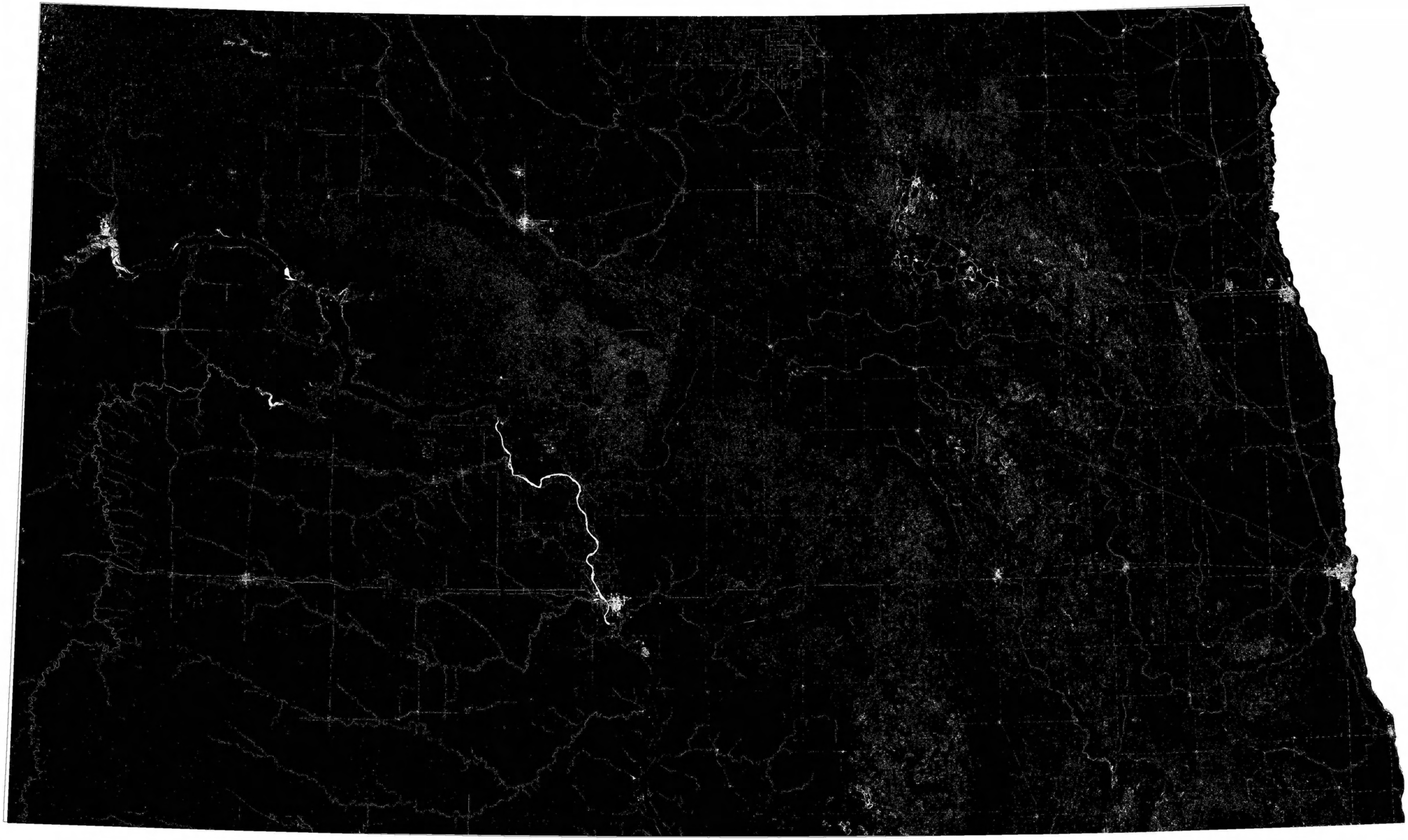
Bighorn Sheep (Ovis canadensis)



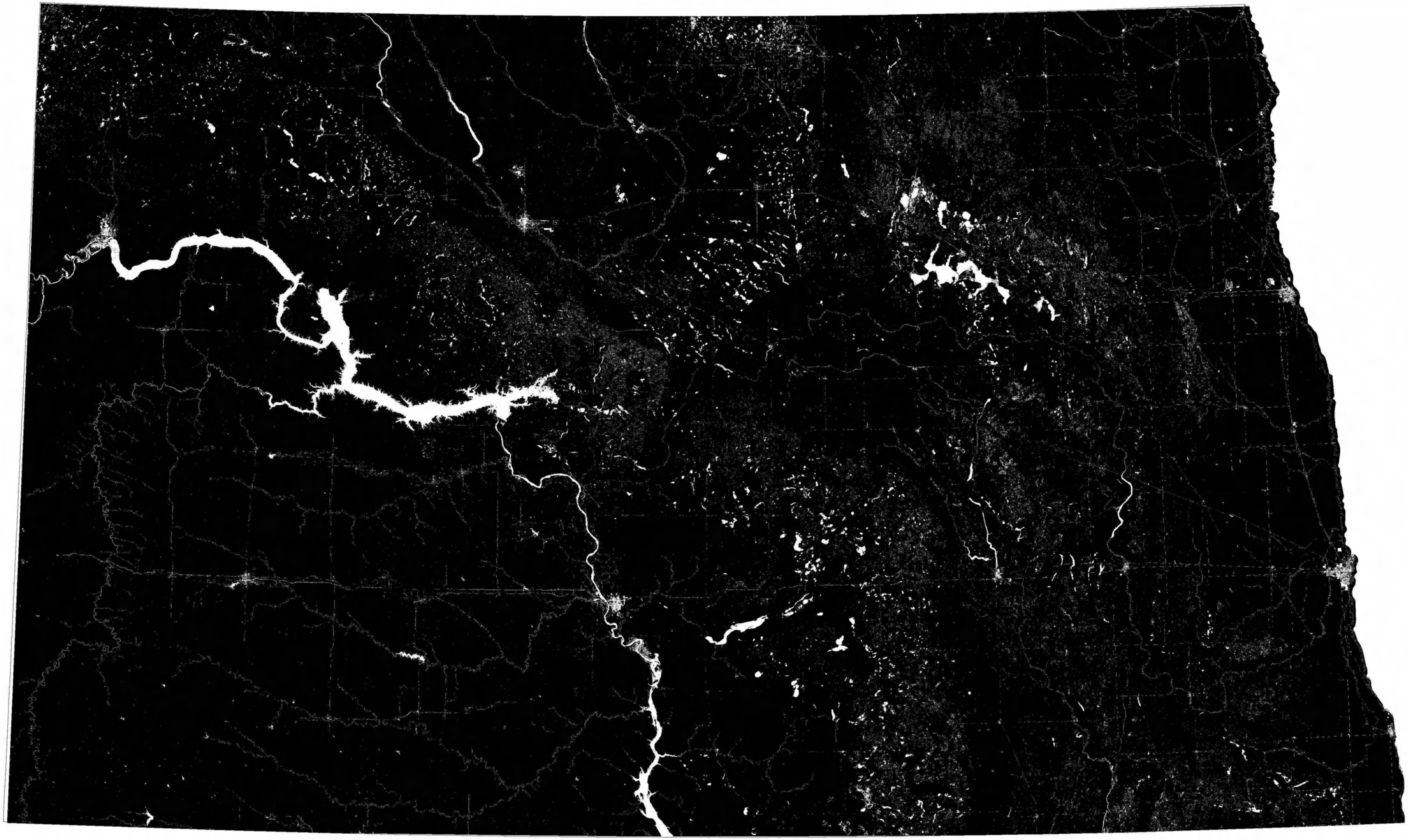
Common Snapping Turtle(Chelydra s. serpentina)



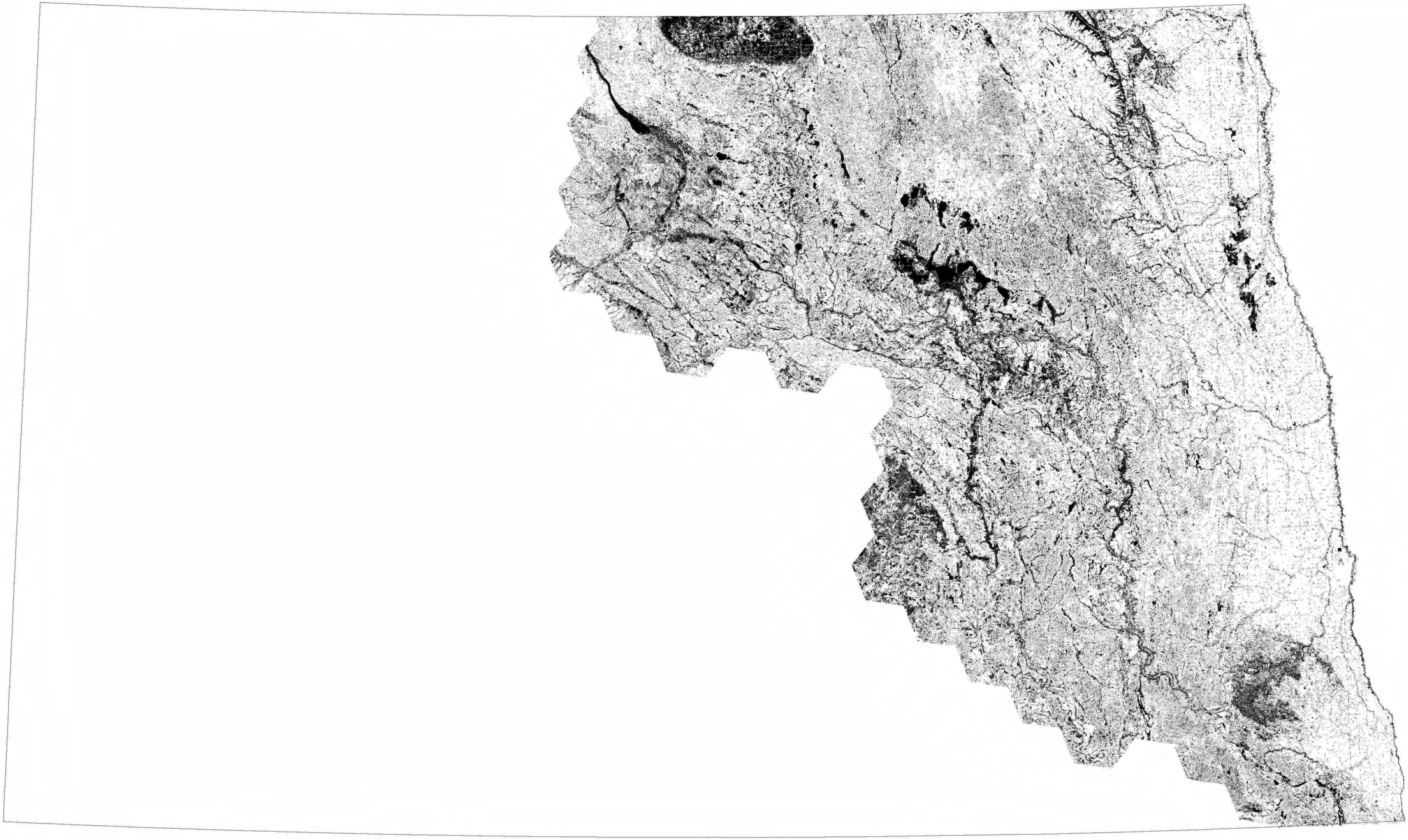
Red Sided Garter Snake(Thamnophis sirtalis parietalis)



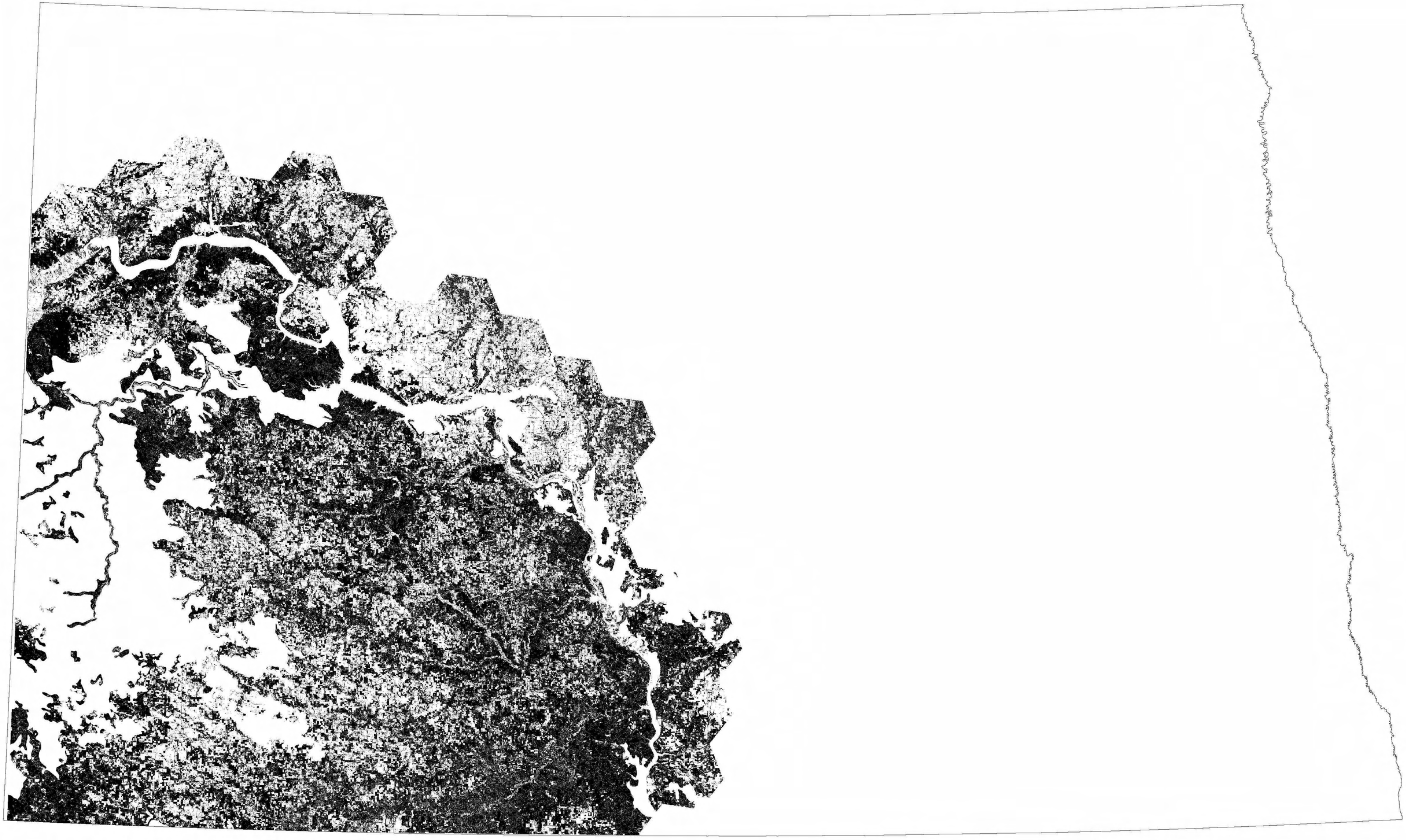
Plains Garter Snake(Thamnophis radix)



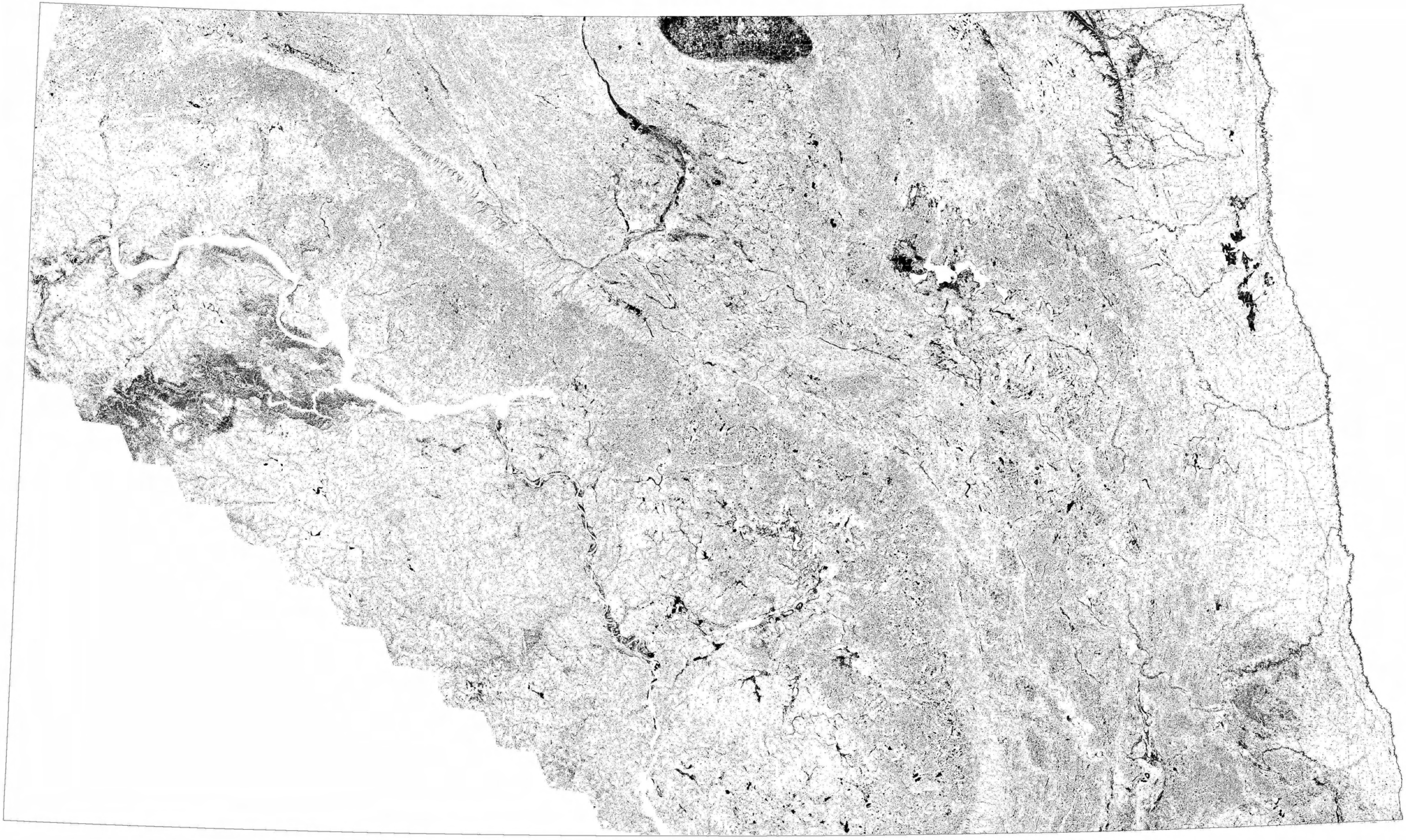
Northern Redbelly Snake(Storeria o. occipitomaculata)



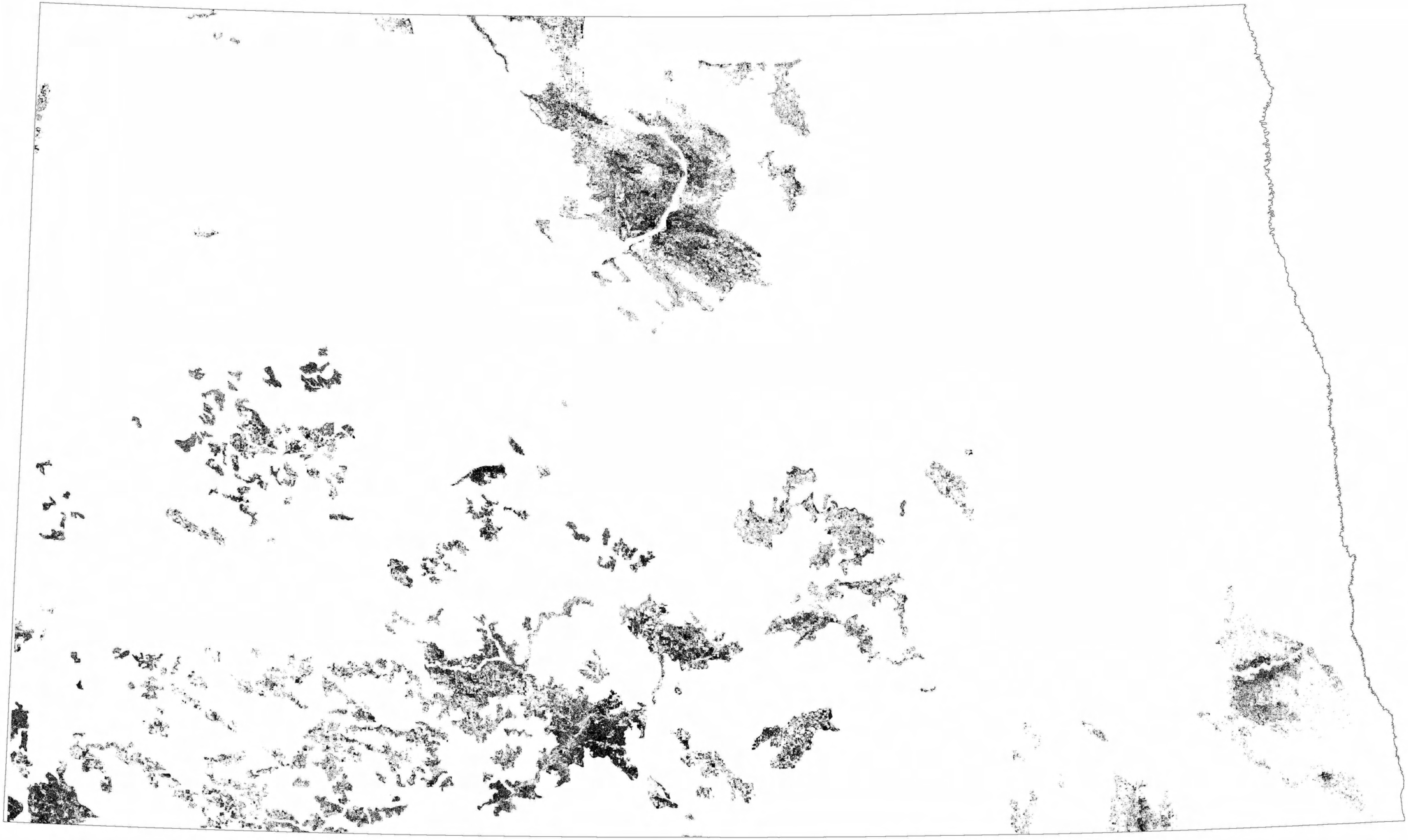
Bullsnake(Pituophis melanoleucus sayi)



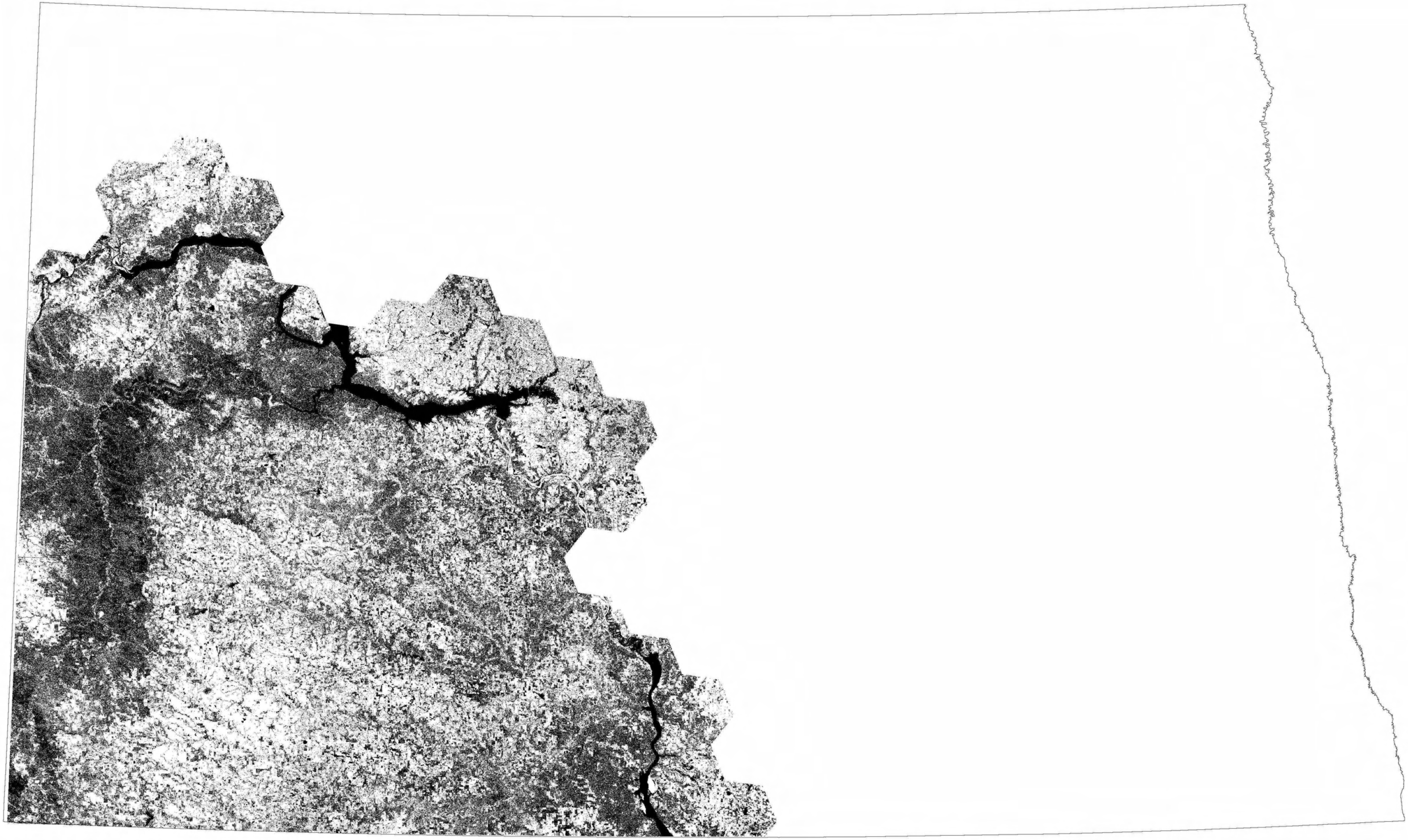
Smooth Green Snake(Opheodrys vernalis)



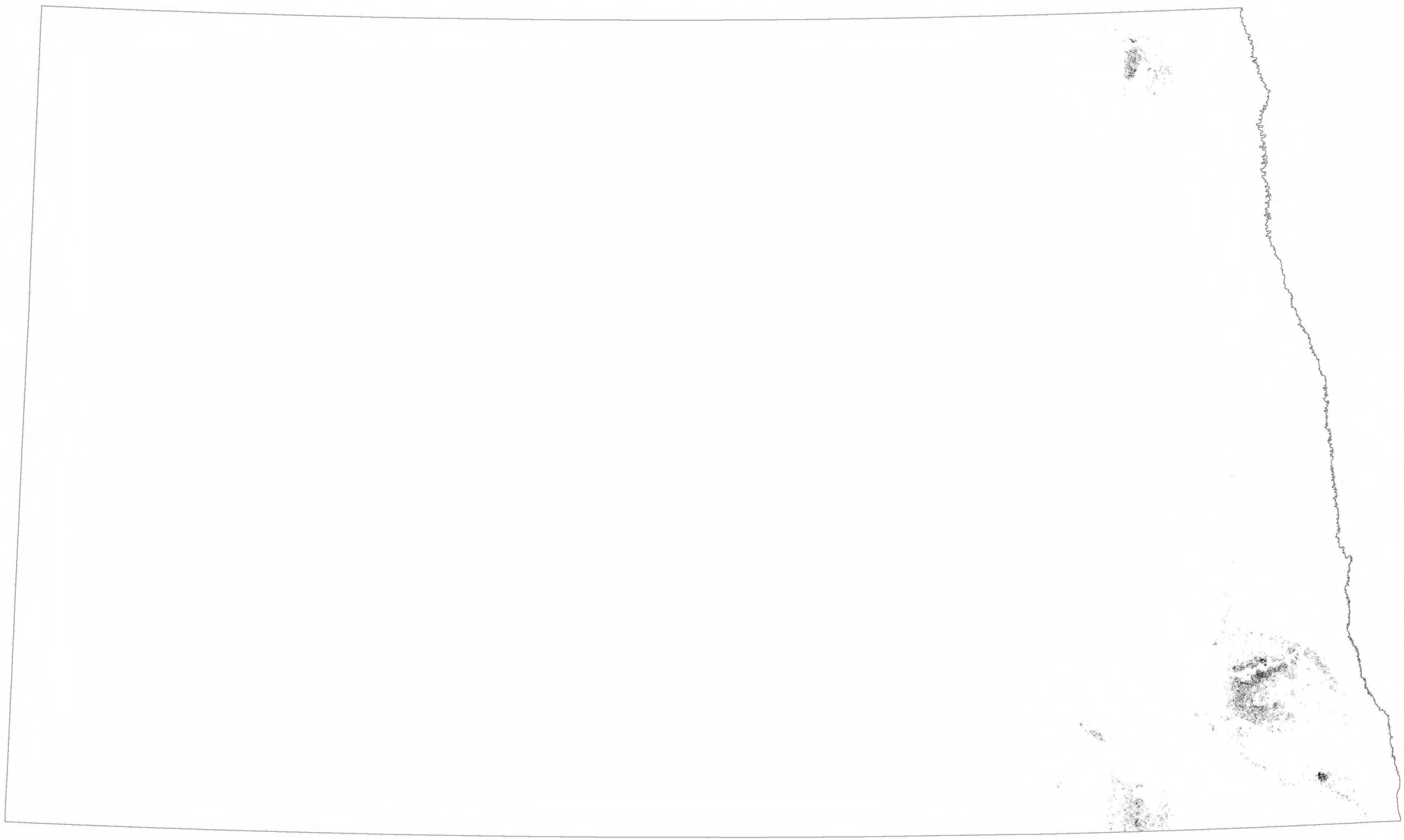
Western Hognose Snake(Heterodon nasicus)



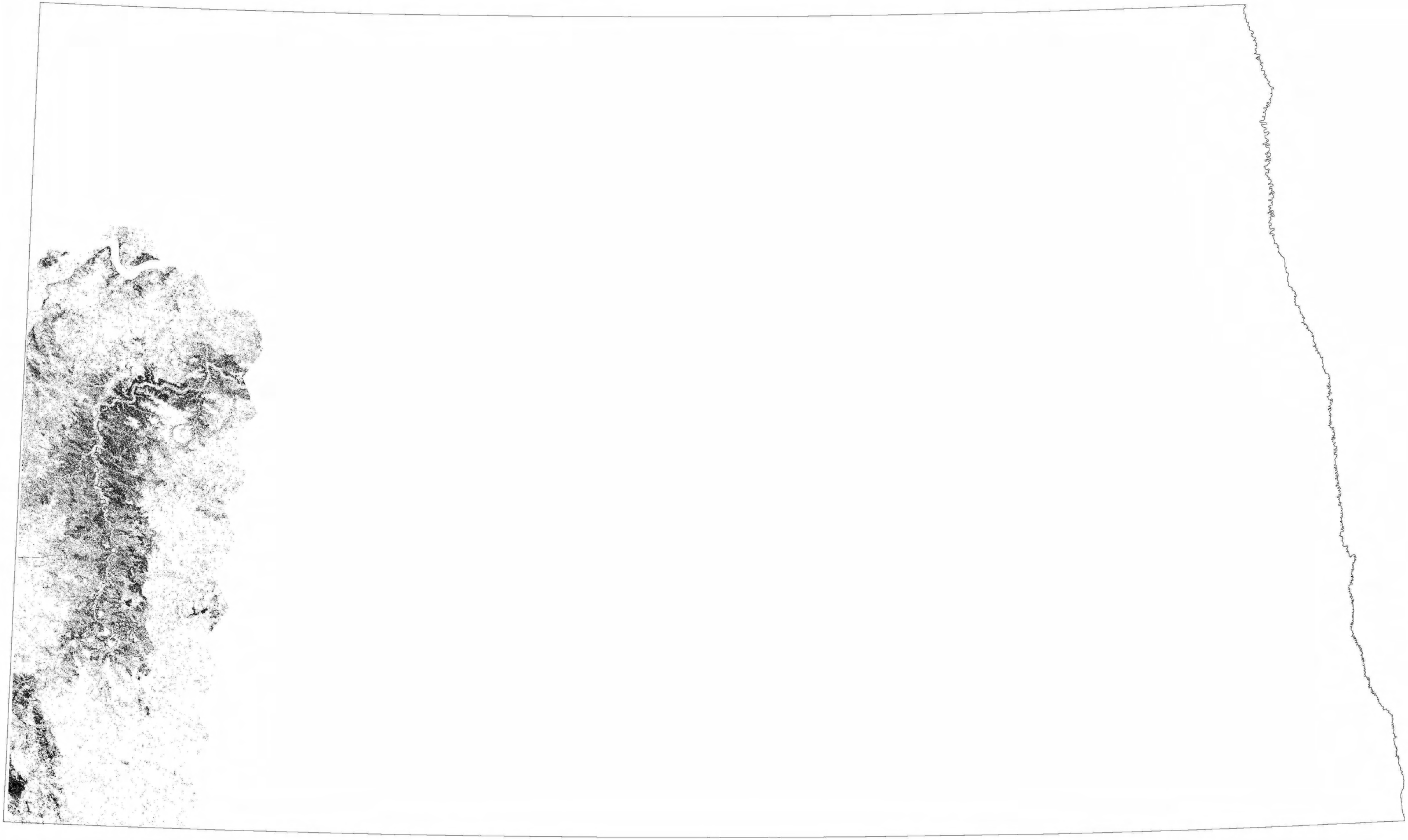
Eastern Yellowbelly Racer(Coluber constrictor flaviventris



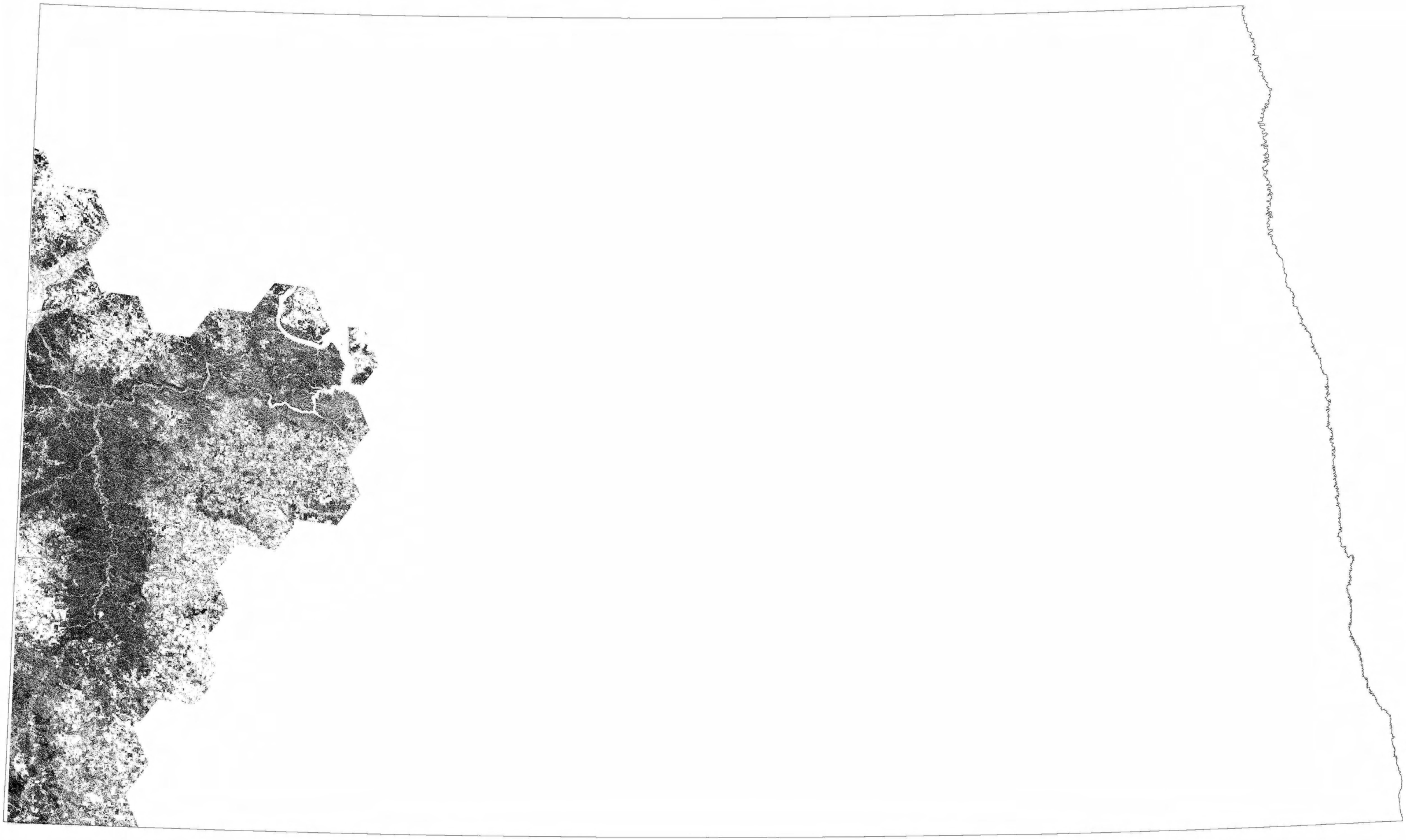
Northern Prairie Skink(Eumeces septentrionalis)



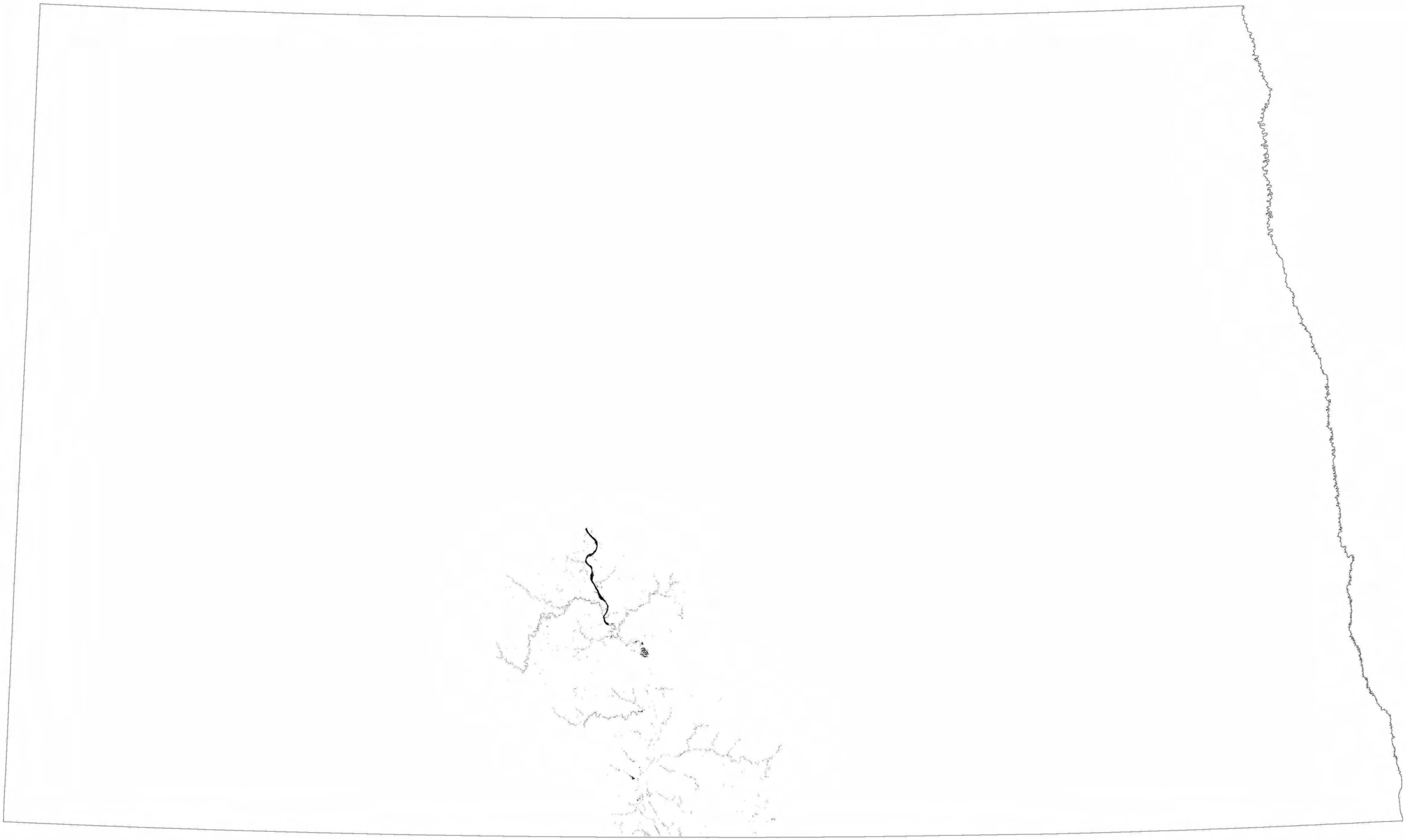
Northern Sagebrush Lizard(Sceloporus g. graciosus)



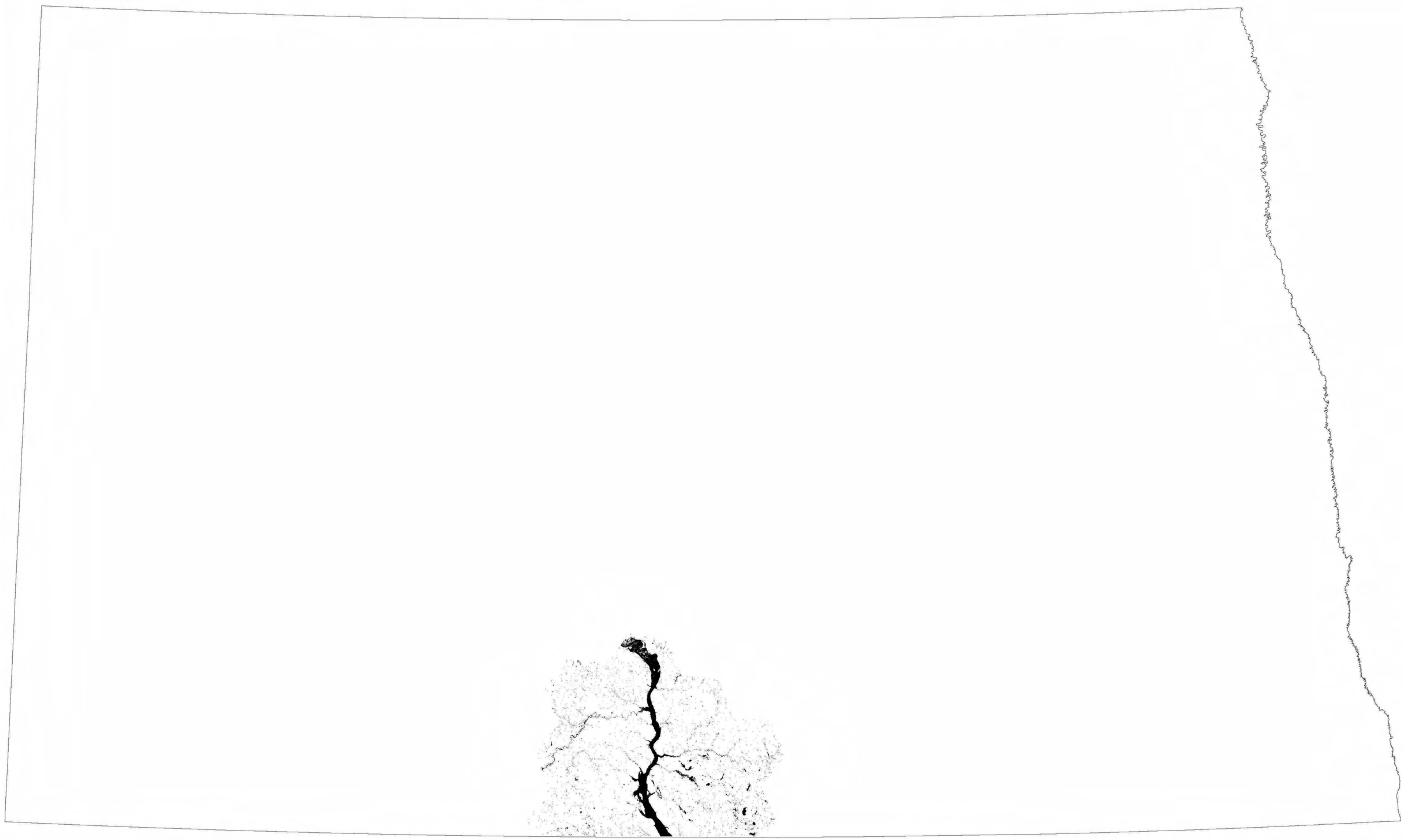
Eastern Short Horned Lizard(Phrynosoma douglassi brev



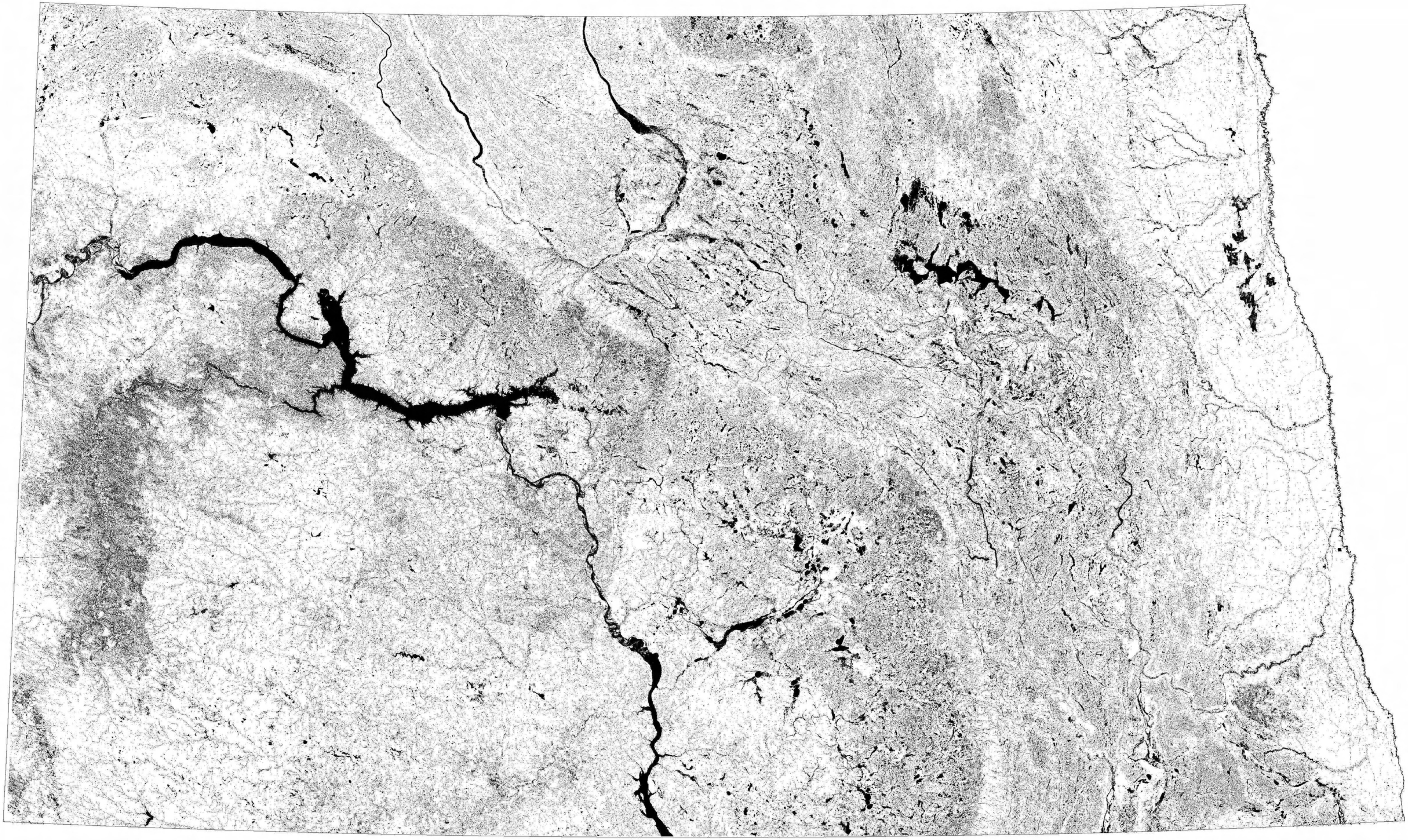
Midland Smooth Softshell Turtle(Apalone m. mutica)



False Map Turtle(Graptemys p. pseudogeographica)



Western Painted Turtle(Chrysemys picta belli)



Prairie Rattlesnake(Crotalus v. viridis)