GEOGRAPHIC INFORMATION SYSTEMS (GIS) DATA OVERVIEW

Presented by Roger Grosse
Rainwater Basin JV GIS Specialist

RAINWATER BASIN
JOINT VENTURE

GIS Data Overview

RWBJV OPEN GIS DATA RESOURCES

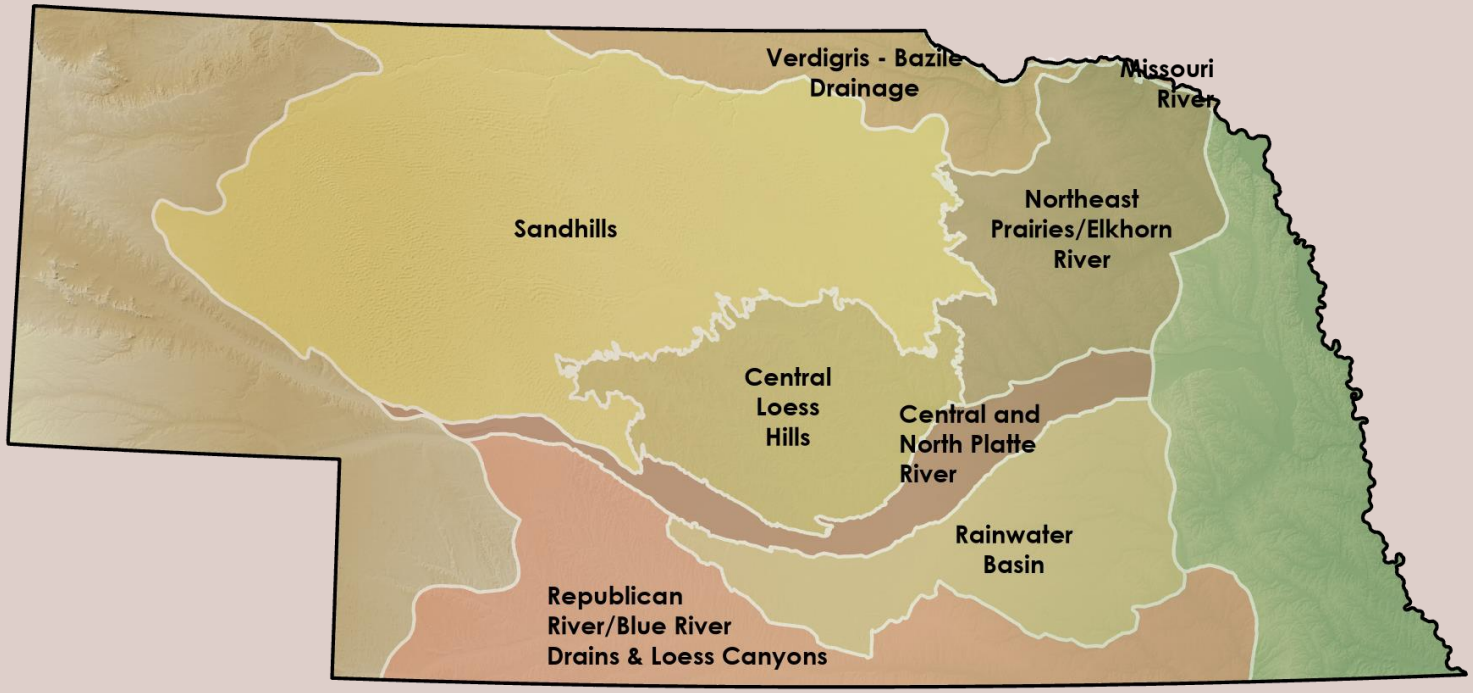
- FOUNDATIONAL DATASETS
- ADDITIONAL DATASETS

RWBJV CONTROLLED DATASETS

OTHER DATA HIGHLIGHTS

Primary OPEN Data Repository located on ScienceBase:
https://www.sciencebase.gov/catalog/folder/542d6e3ee4b092f17defc637

RAINWATER BASIN JOINT VENTURE GEOGRAPHIC FOCUS AREAS (GFAS)



RWBJV's eight GFAs are based on composites of EPA level IV ecoregions, NRCS Major Land Resource Areas (MLRAs), and NGPC Biologically Unique Landscapes.

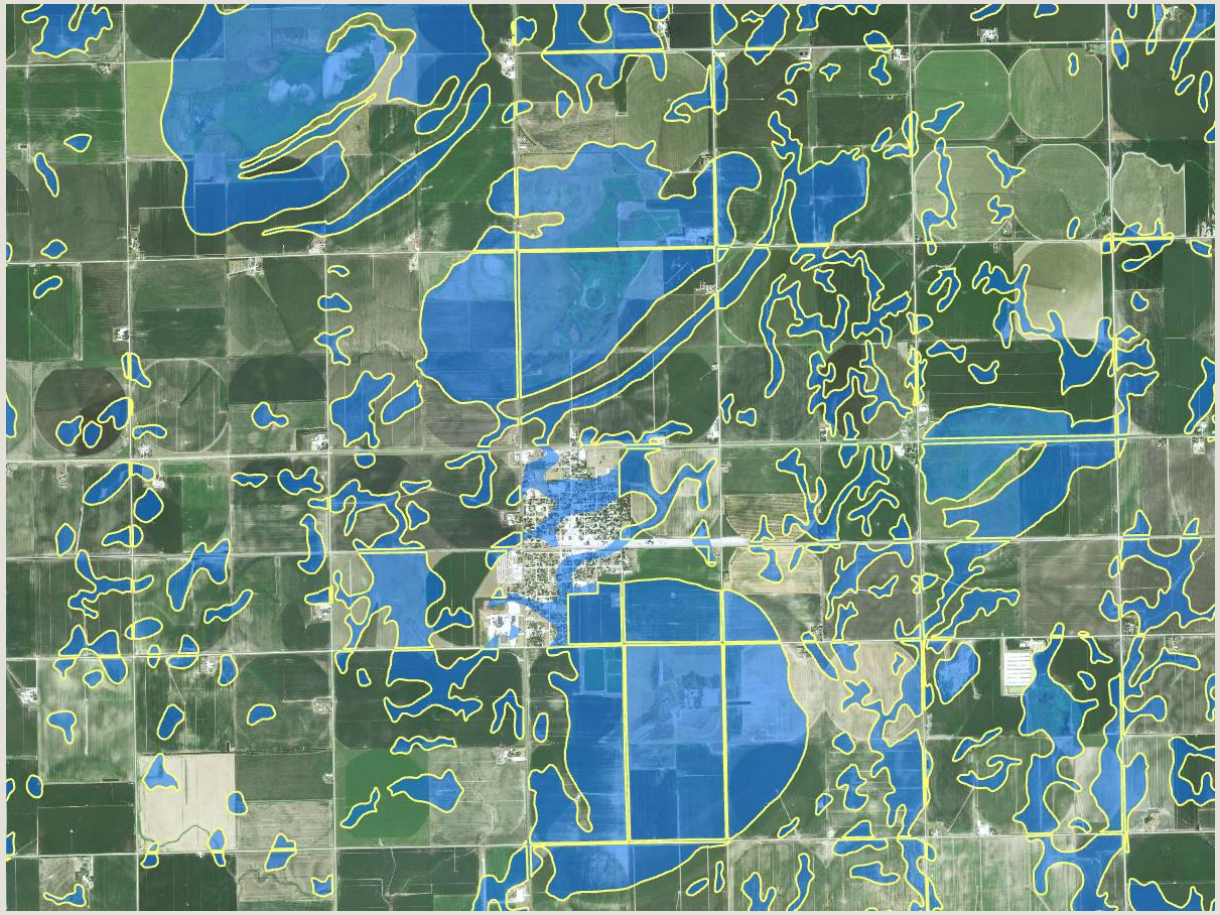
All RWBJV Planning Document objectives are stepped-down to the GFA level bird and habitat goals.

https://www.sciencebase.gov/catalog/item/63efab0ad34efa0476b0383a

RWBJV WATERFOWL GOALS

- Step down of North American Waterfowl Plan (NAWMP) population goals.
- Energetics model: (migratory) population goals > proportion of dietary needs (KCals), KCals available from seeds, and seeds ponded (duck use days provided).
  - Additional habitat/birds population support obtained by:
    1. Increasing available habitat through wetland restoration (new acres)
    2. Increasing/maintaining wetland forage (KCal) production through vegetation management
    3. Increase frequency (annual) and duration of ponding during Spring migration
- In order to establish and monitor progress toward bird/habitat goals, RWBJV must be able to quantify the 3 habitat delivery strategies/metrics above.

Rainwater Basin Historic Wetlands Mask (RWB HWM)



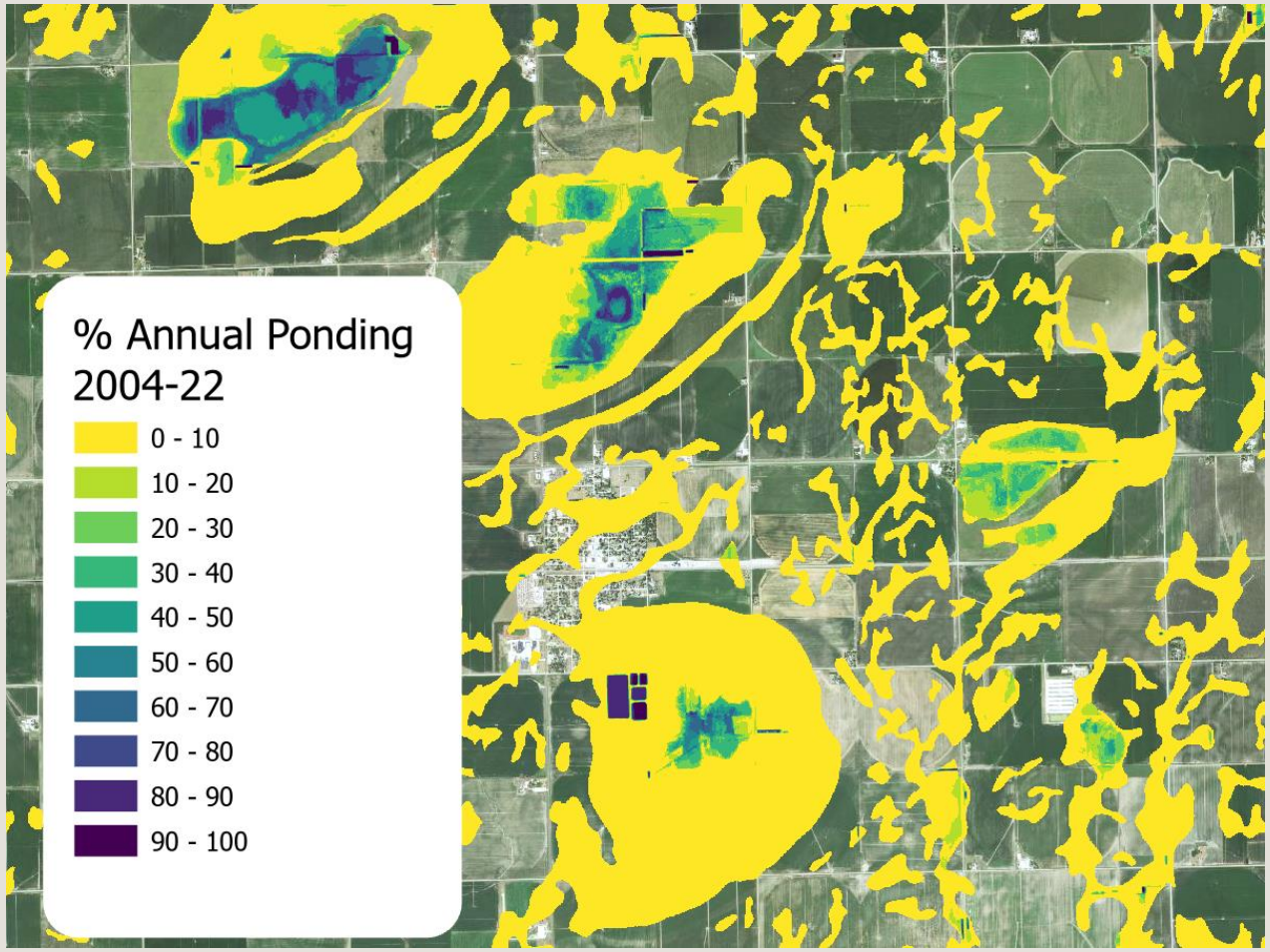
Historic estimates of wetland extent based on hydric soils, National Wetland Inventory (NWI), and historic wetland surveys (2004 only).

Variants

- RWB HWM FP (Footprints)
- RWB HWM FPCP (Footprint Components)
- RWB HWM 2011 (Watershed Enforced)
- RWB HGM (Hydrogeomorphic Model)

RWB HWM 2004: https://www.sciencebase.gov/catalog/item/62eacd82d34eacf53971d28b
RWB HWM 2016: https://www.sciencebase.gov/catalog/item/62ead231d34eacf53971d29c

Annual Habitat Surveys (AHS) 2004-23



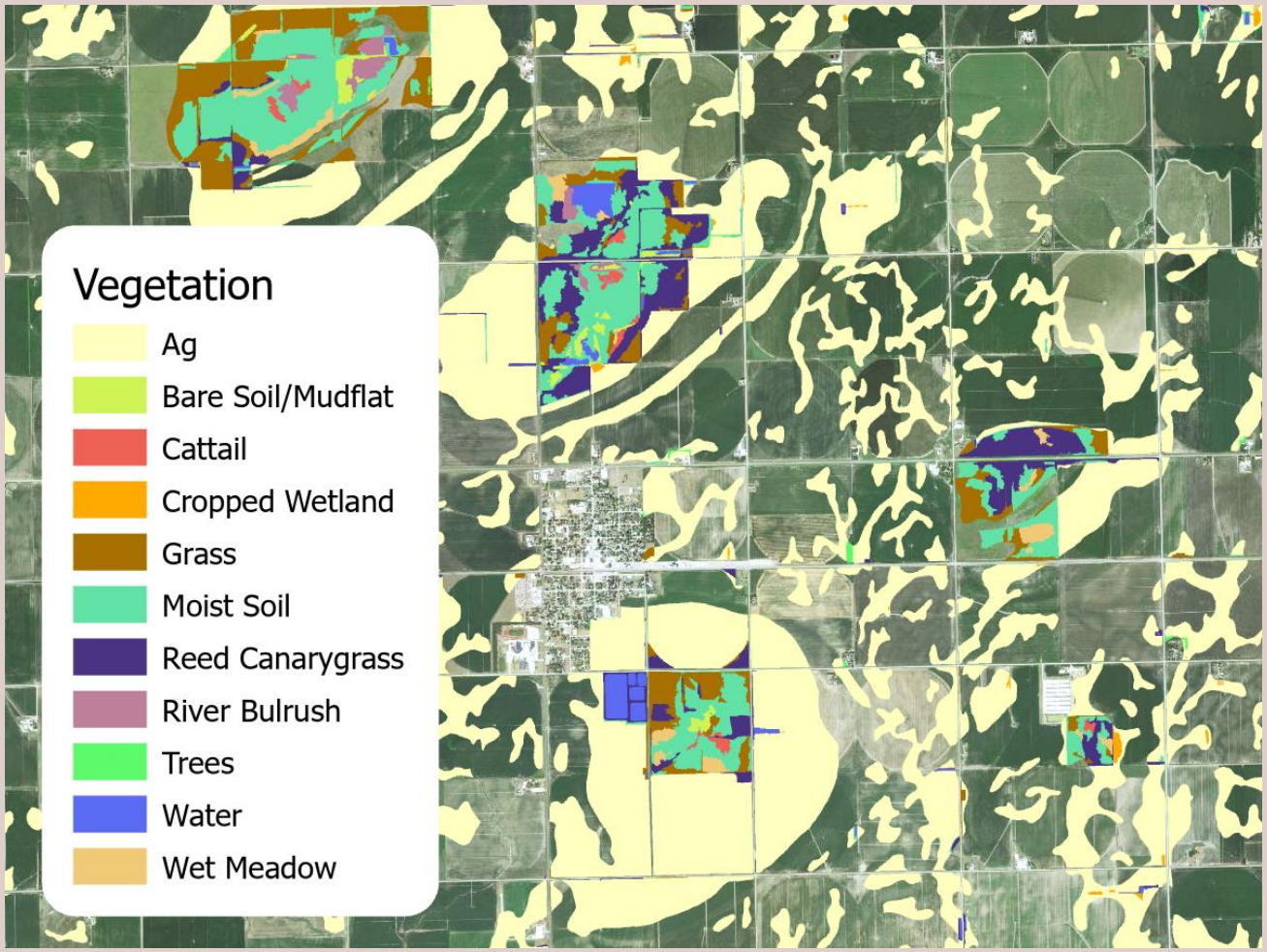
Annual ponded and functional (hydrophyte vegetation + ponding) extent captured during Spring migration.

Annual snapshot of habitat availability produced through classification of aerial photographs obtained by RWBJV.

Imagery extent varies annually and mask revision (2016-current) requires consideration. 2004-2015 uses HWM 2004, 2016 uses the combined 2004 & 2016 HWM extent.

https://www.sciencebase.gov/catalog/item/570e7193e4b0ef3b7ca24d1d

RAINWATER BASIN VEGETATION MAP

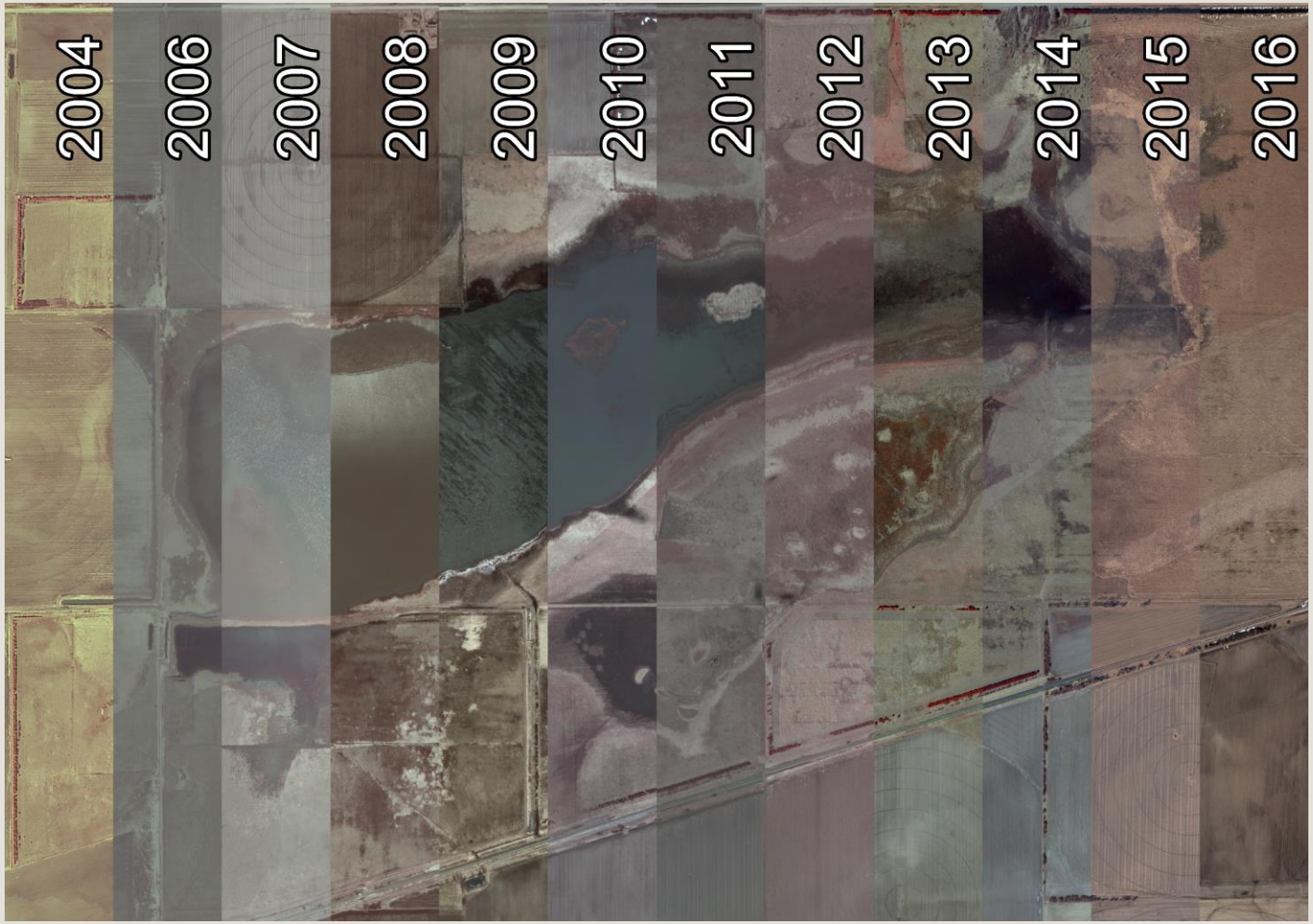


Classification grouped by vegetative community (early successional, late successional, farmed) and KCal estimates applied to each vegetation community.

Overlayed with annual ponding from AHS to estimate annual ponded KCals provided.

RWB Vegetation Map 2004: https://www.sciencebase.gov/catalog/item/570e693be4b0ef3b7ca24d00
RWB Vegetation Map 2012: https://www.sciencebase.gov/catalog/item/5604423de4b03bc34f544c4c

Rainwater Basin Image Library



Collection of aerial photographs obtained by RWBJV for use in AHS and RWB vegetation map production.

Spring images acquired annually. Late summer images acquired for vegetation mapping (2004 & 2012)

https://www.sciencebase.gov/catalog/item/57864feee4b0e02680c0eb30

RAINWATER BASIN WATERSHEDS

Two versions available. For general use, see complete contemporary watersheds developed by UNL (Tang, RWB HWM 2004).

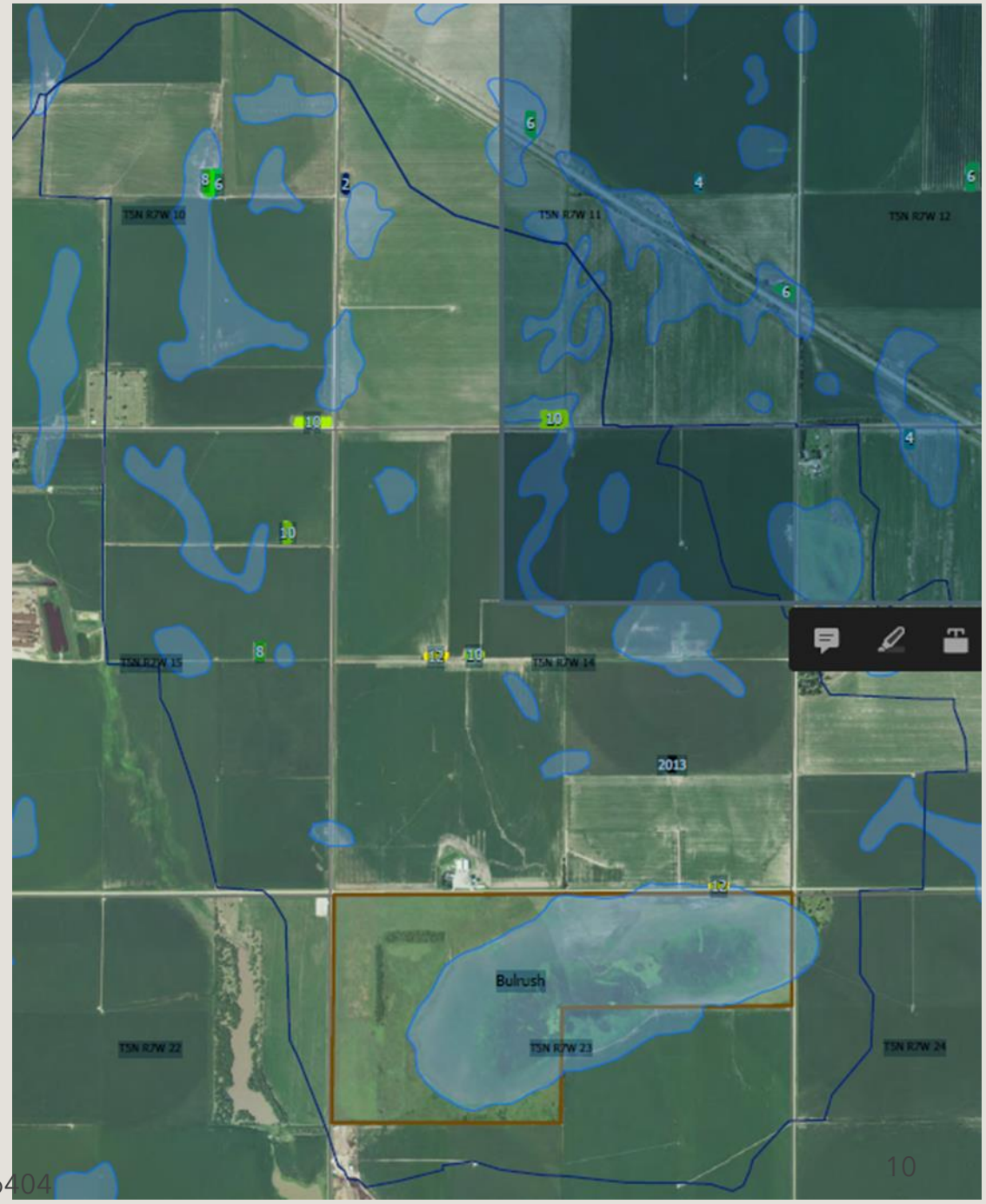
Another specifically developed for the RWB watershed pit fill model, with two alternative versions of this data:

- Nested sub-basin
- Primary basin (pit fill model, RWB HWM 2011)

UNL Watersheds: https://www.sciencebase.gov/catalog/item/59f2238be4b0220bbd9ddd1a
RWB Pit Fill Model Watersheds: URL Pending

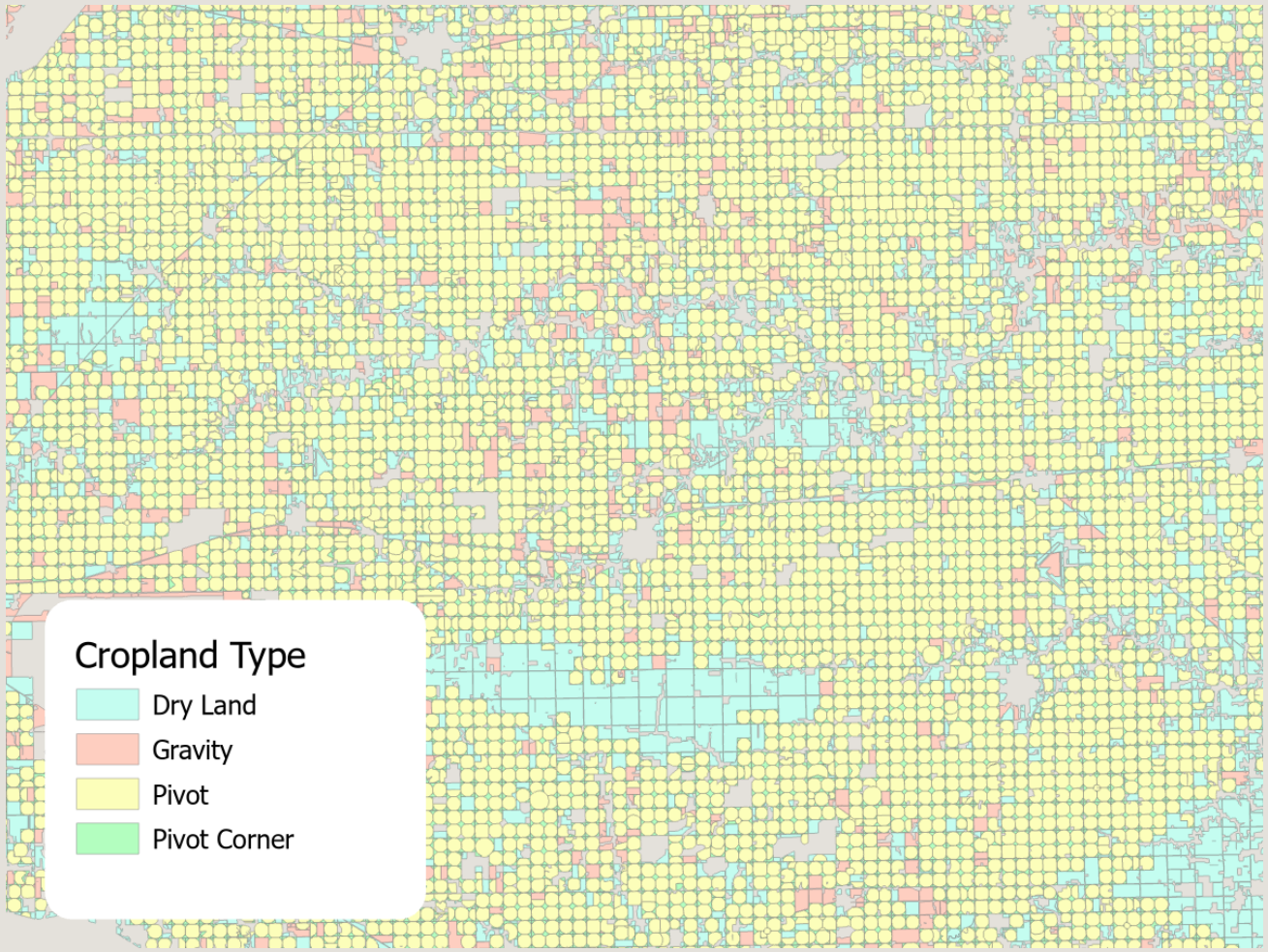
Rainwater Basin Pit & Pit Fill Inventories

- Last revision to pit inventory performed in 2012.
- Subsequent updates merely remove filled pits.
- Inventory identifies all pits within the RWB BUL, not only RWB watersheds.
- Filled pits exported annually from project tracking.



Pit Inventory: https://www.sciencebase.gov/catalog/item/6321f1e3d34e71c6d67ab400
Filled Pit Inventory: https://www.sciencebase.gov/catalog/item/6321f20ad34e71c6d67ab404

Rainwater Basin & Twin Platte NRD Agricultural Inventory



- Delineates row crop agriculture as pivot irrigated, gravity irrigated, pivot corner, or dry land production.
- Initially developed to quantify number and area of RWB wetland under pivot irrigation for WREP proposal.
- Twin Platte NRD included as an exploratory proposal for a pivot efficiency incentive program.

https://www.sciencebase.gov/catalog/item/6089aa4cd34ef6cfc4a8850c

RWBJV LANDBIRD GOALS

- Step down of Partners in Flight (PIF) population goals, stabilize or reverse declines.
- Key assumption: Grassland bird population loss is the result of grassland habitat loss, with two primary drivers: grassland conversion to row crop production and grassland loss to woodland transition/encroachment.
  - Conservation strategies to support bird populations:
    1. Grassland **Restoration** through reseeding (e.g. traditional CRP) and tree removal (>5% canopy density).
    2. Grassland **Enhancement/Maintenance** through tree removal and Rx Fire (<5% canopy).
    3. Grassland **Persistence** through grazing infrastructure improvements and Rx grazing.
    4. Grassland **Protection**, in Nebraska primarily associated with wetland easement buffers.
- In order to establish and monitor progress toward bird/habitat goals, RWBJV must be able to quantify the 4 habitat delivery strategies/metrics above.

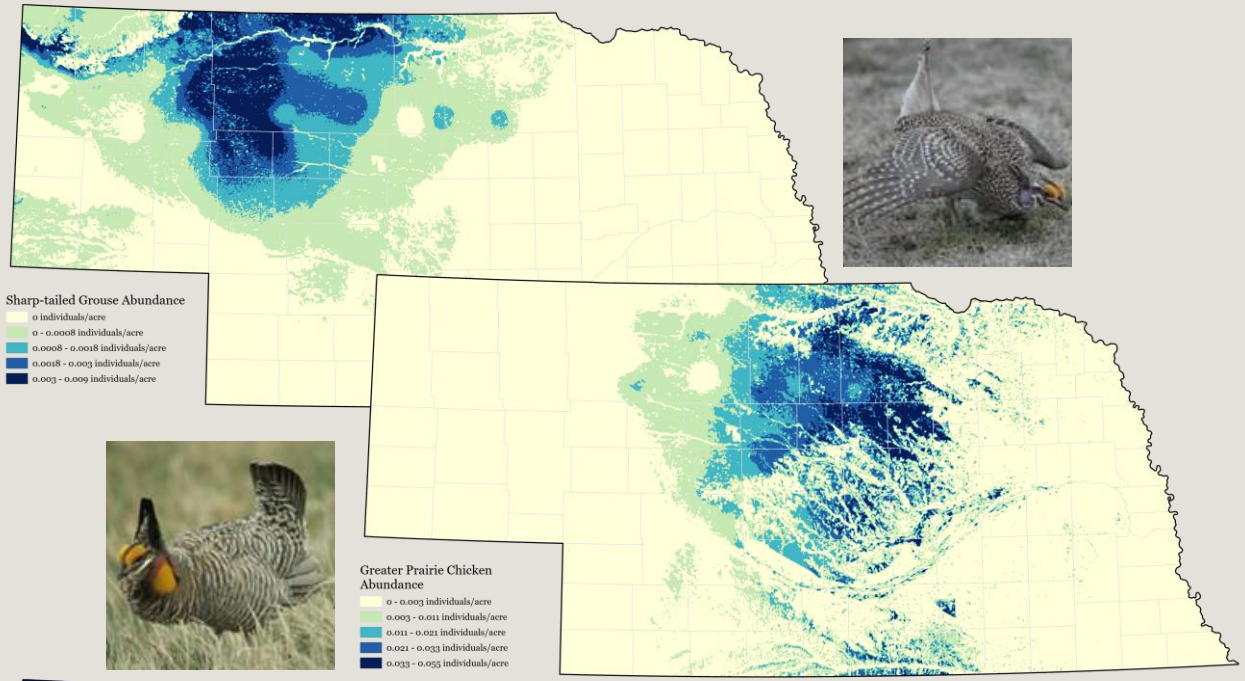
Grassland Bird Models

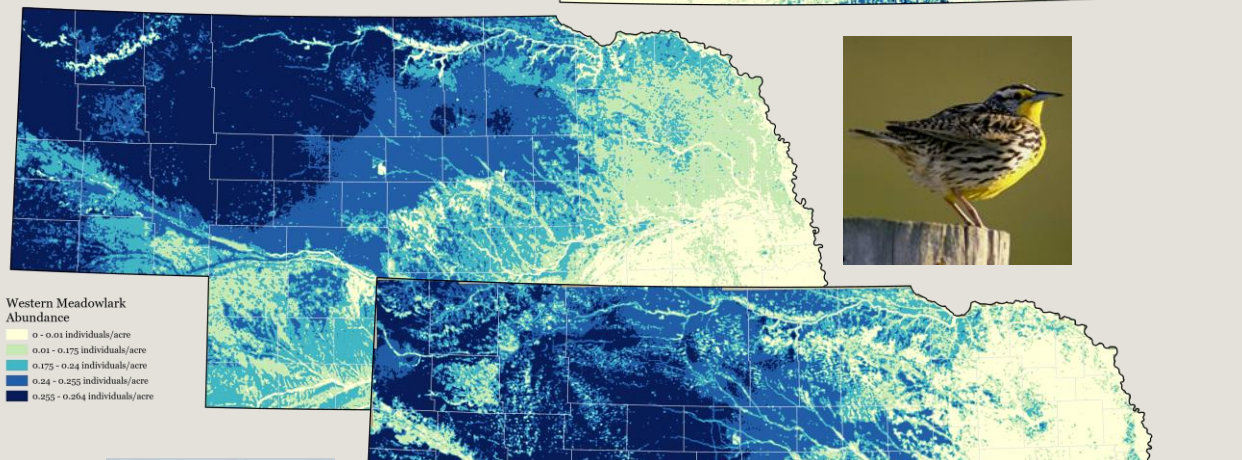
State-wide distribution of bird abundance for planning species.

Can be used to estimate bird population impacts of conservation delivery.

Bird Priority Areas (BPAs) are based on 50% population cores.

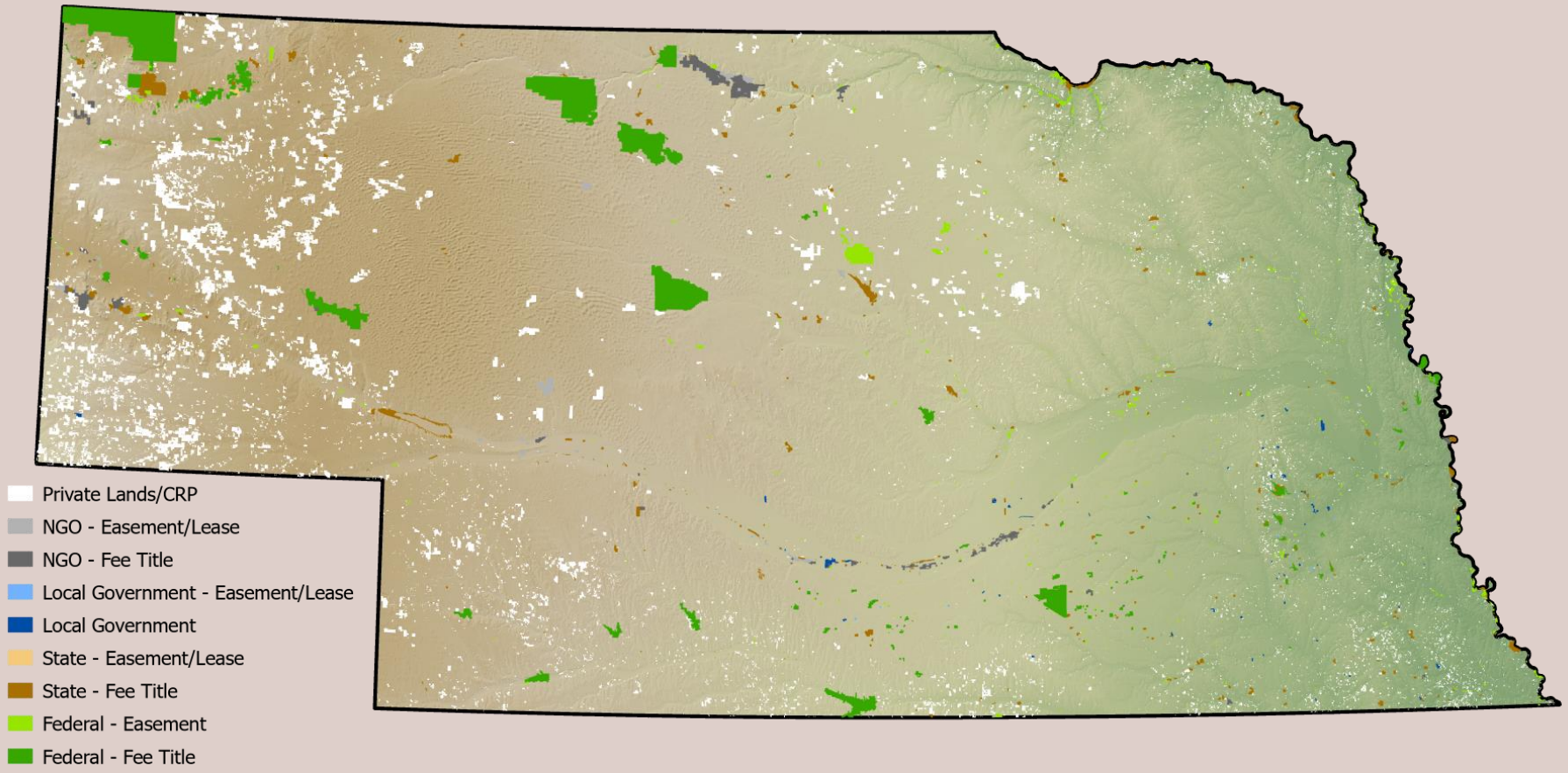
BPAs can be identified for any geography (state, JV, GFA, NRD).





Breeding Bird Models: https://www.sciencebase.gov/catalog/item/620d3825d34e6c7e83ba9a47
Nebraska (NGPC) Grouse Models (GRPC & STGR): In-publication process

RWBJV PROJECT TRACKING (CONSERVATION ESTATE)

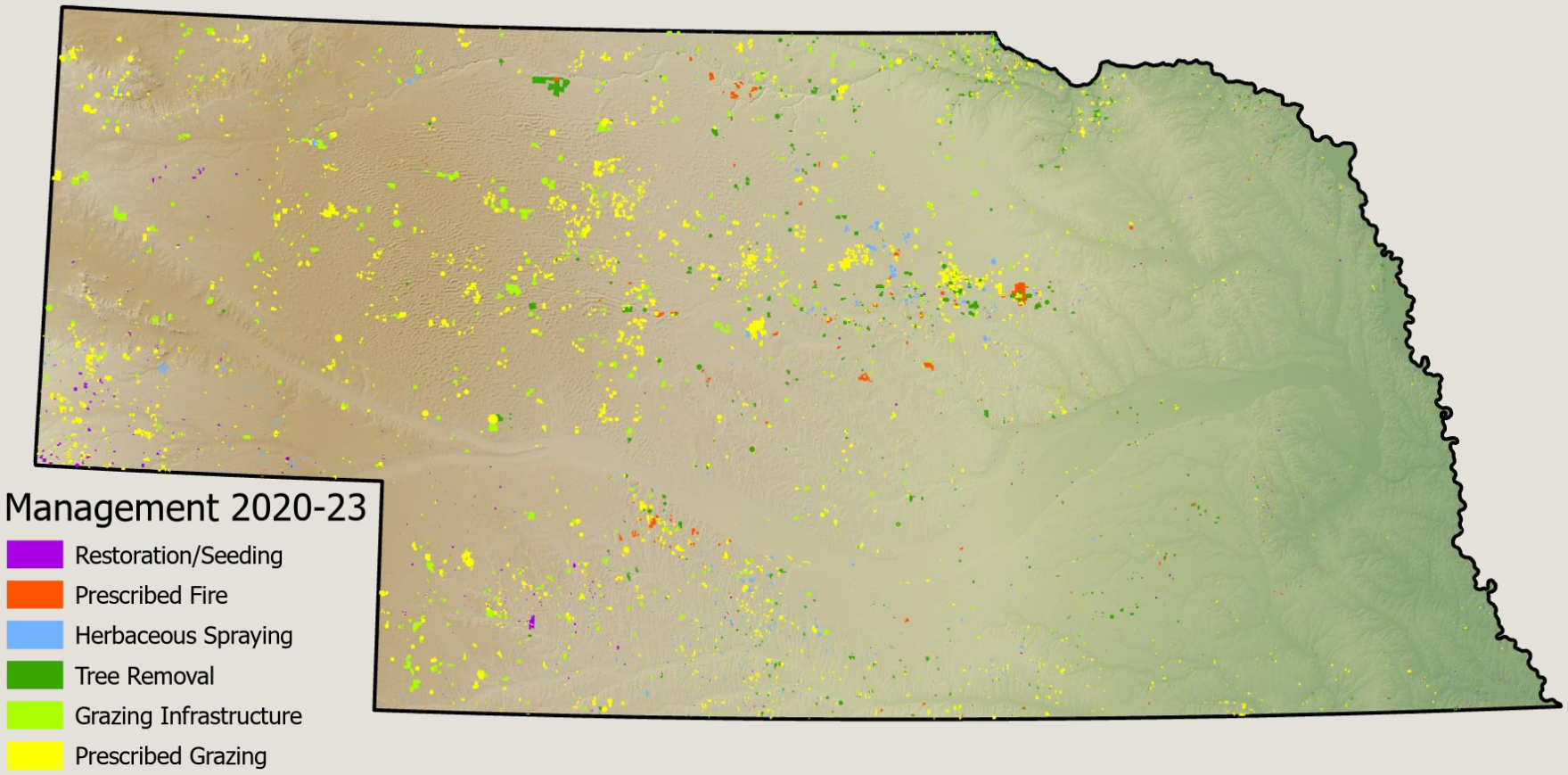


Partially controlled (private land and CRP information) database containing statewide conservation enrollment: fee title, easements and private land agreements.

Analogous OPEN data: USGS Protected Areas Database (PAD-US) and National Conservation Easement Database (NCED).

USGS PAD-US: https://www.usgs.gov/programs/gap-analysis-project/science/pad-us-data-download
National Conservation Easement Database: https://www.conservationeasement.us

Management Tracking Database

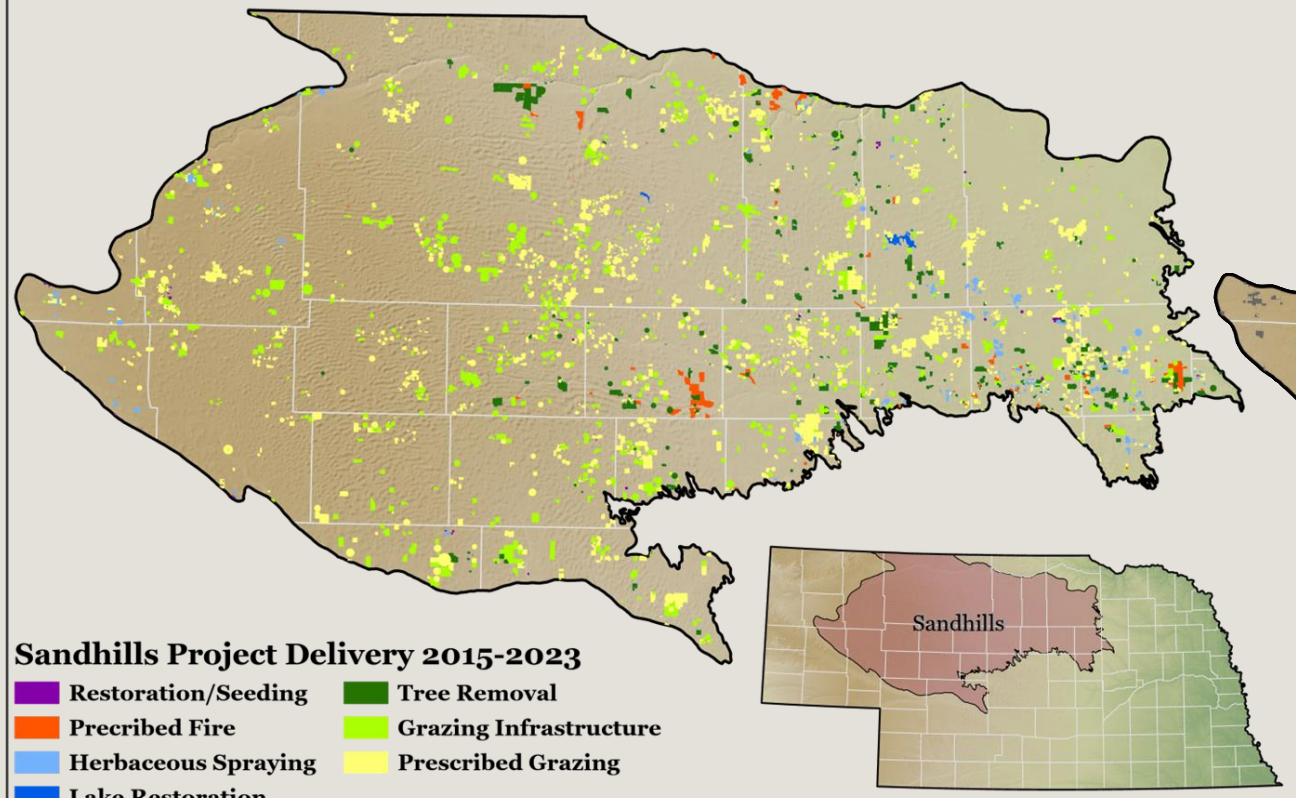


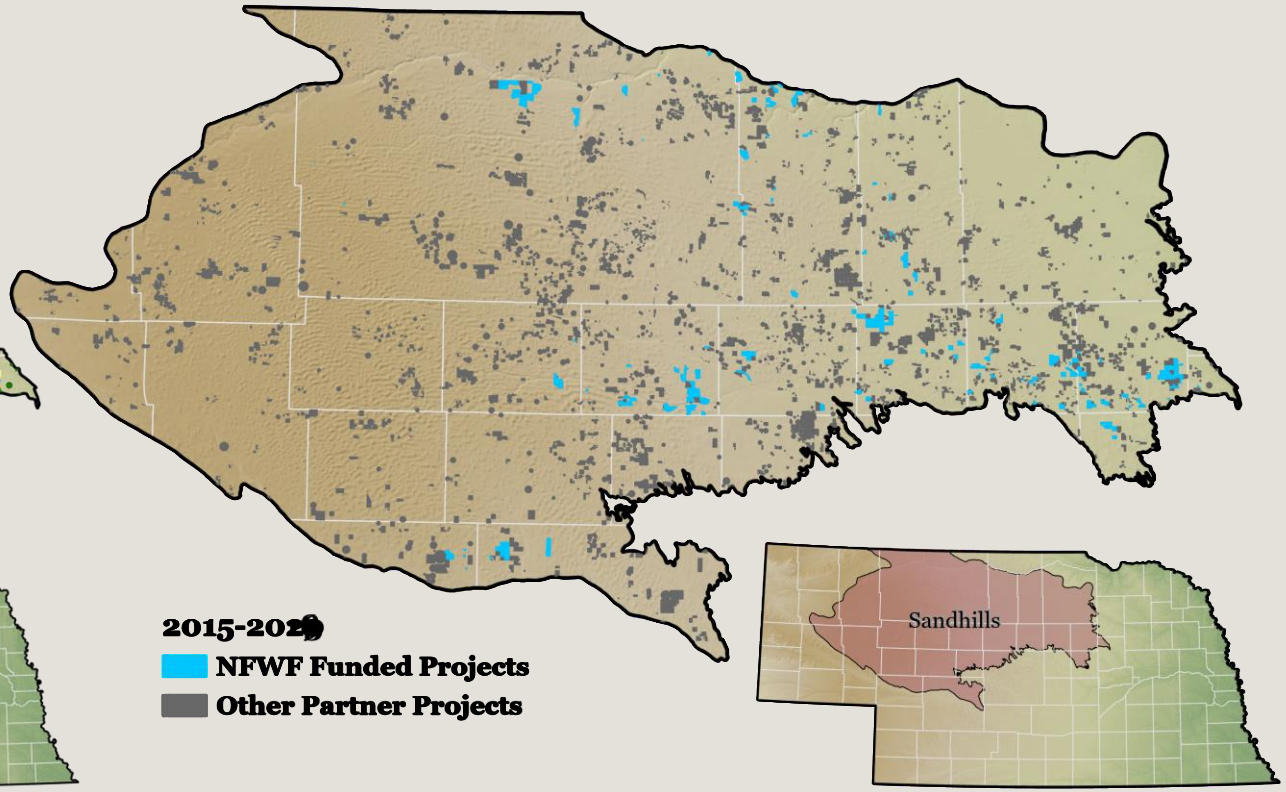
Largely controlled database containing statewide management delivery from participating partners and/or facilitated by RWBJV.

Analogous OPEN data initiative (*planning stage*): Grasslands Conservation Efforts Database (CED)

Conservation Efforts Database (Sagebrush): https://www.conservationefforts.org

Nebraska Sandhills Partnership Delivery & NFWF Funding Demonstration





NEBRASKA SOIL EROSION INDEX

Revised Universal Soil Loss Equation (RUSLE2) modeled developed with NRCS to estimate wind and rill erosion.

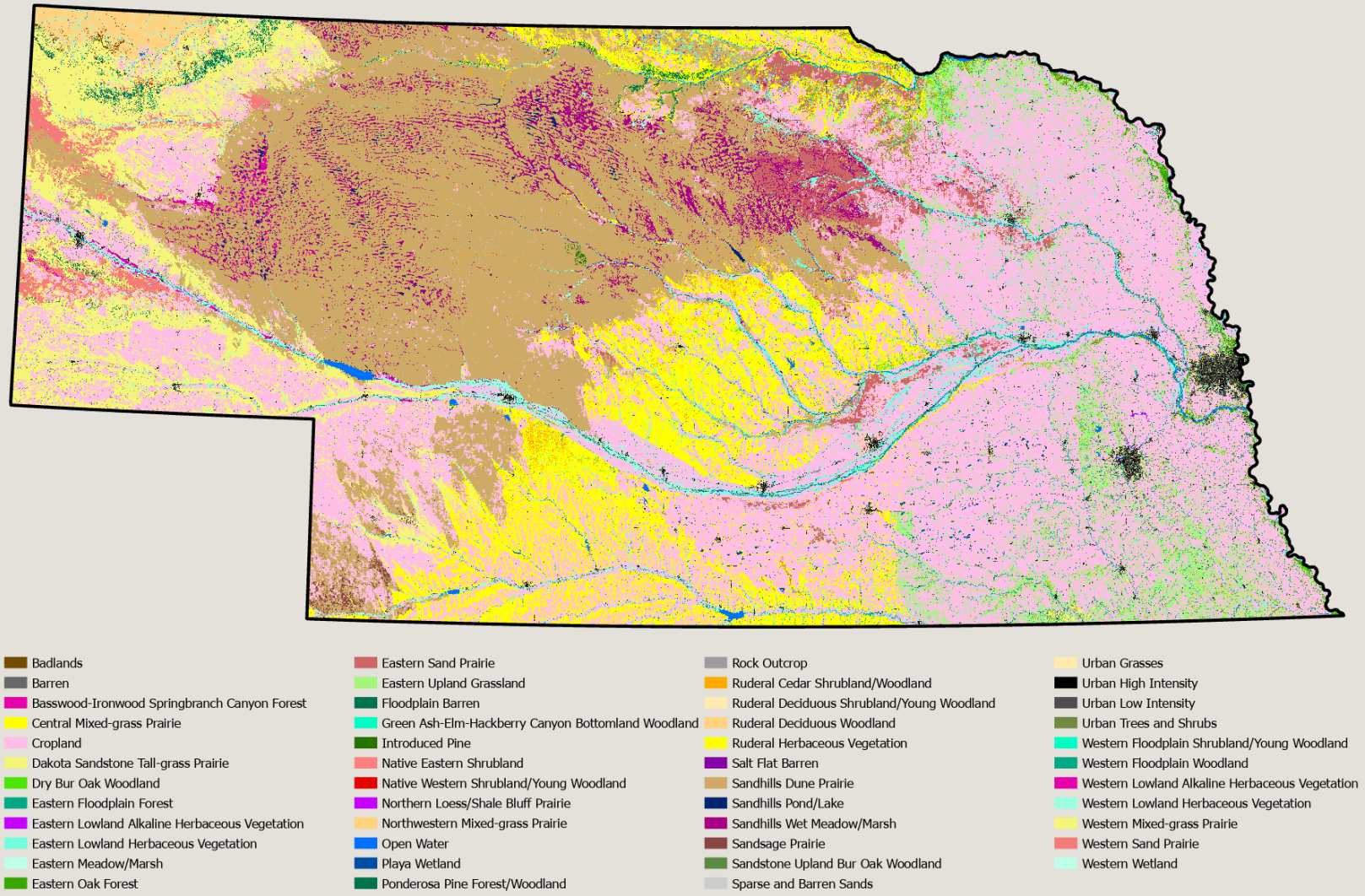
Areas of wind or rill erosion potential >= 8 (tons/acre) designated as Highly Erodible Lands (HEL).

HEL designation used to determine general Conservation Reserve Program (CRP) enrollment eligibility.

FSA recently developed an HEL layer used for official CRP enrollment but currently is not an OPEN dataset.

https://www.sciencebase.gov/catalog/item/5434541ee4b095098ca8d7a0

Nebraska Land Cover



Last version of RWBJV Nebraska Land Cover was the 2016 version (depreciated).

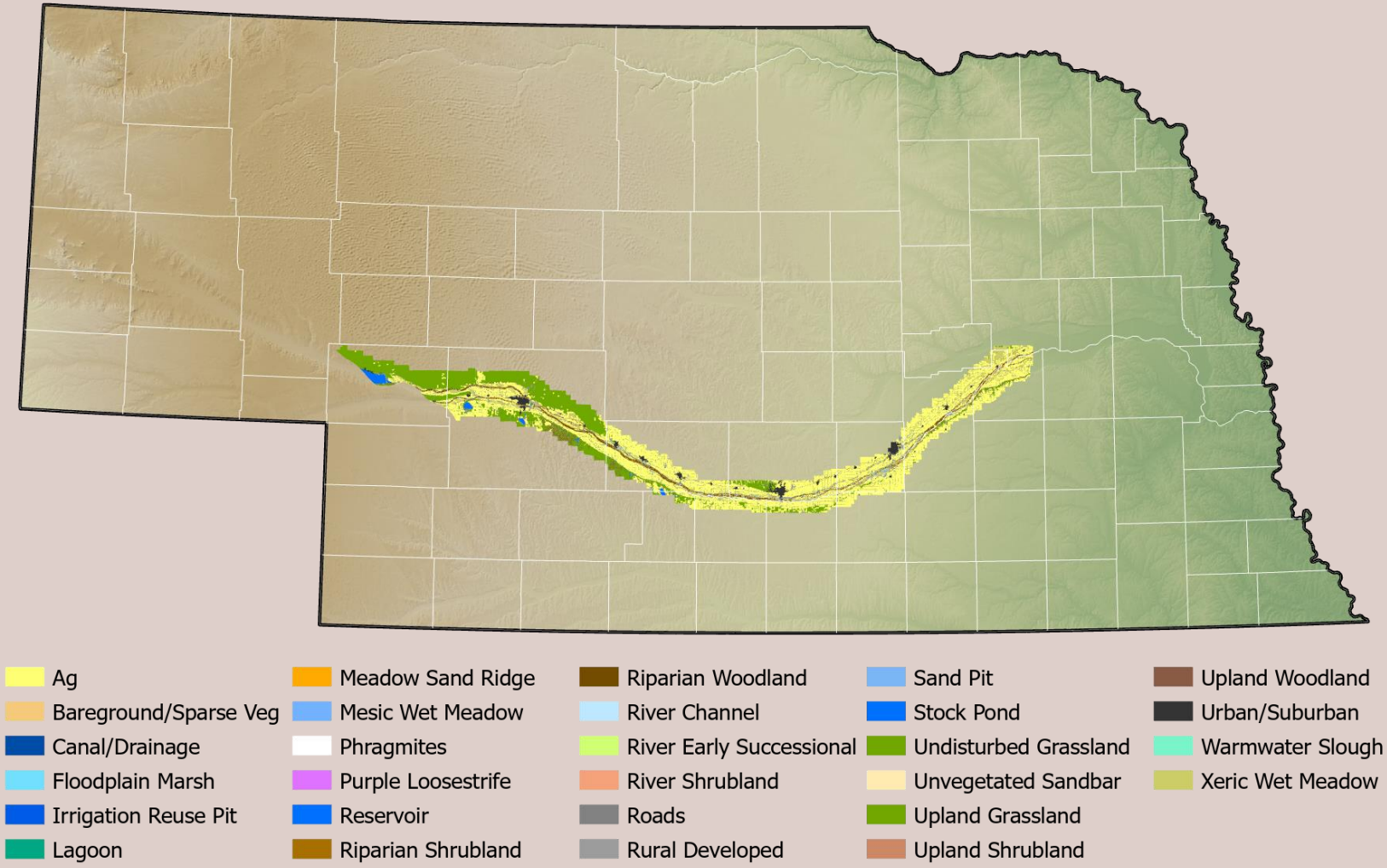
NGPC and Missouri Resource Assessment Partnership (MoRAP) collaborated on a 10-m Ecological Systems map for Nebraska (completed 2021, 2018 land status).

Nebraska Ecological Mapping System (MoRAP): https://www.sciencebase.gov/catalog/item/6148fef9d34e0df5fb96b946
RWBJV Nebraska Land Cover (depreciated): https://www.sciencebase.gov/catalog/item/6081b417d34e8564d686633f

CENTRAL PLATTE RIVER LAND COVER 2005

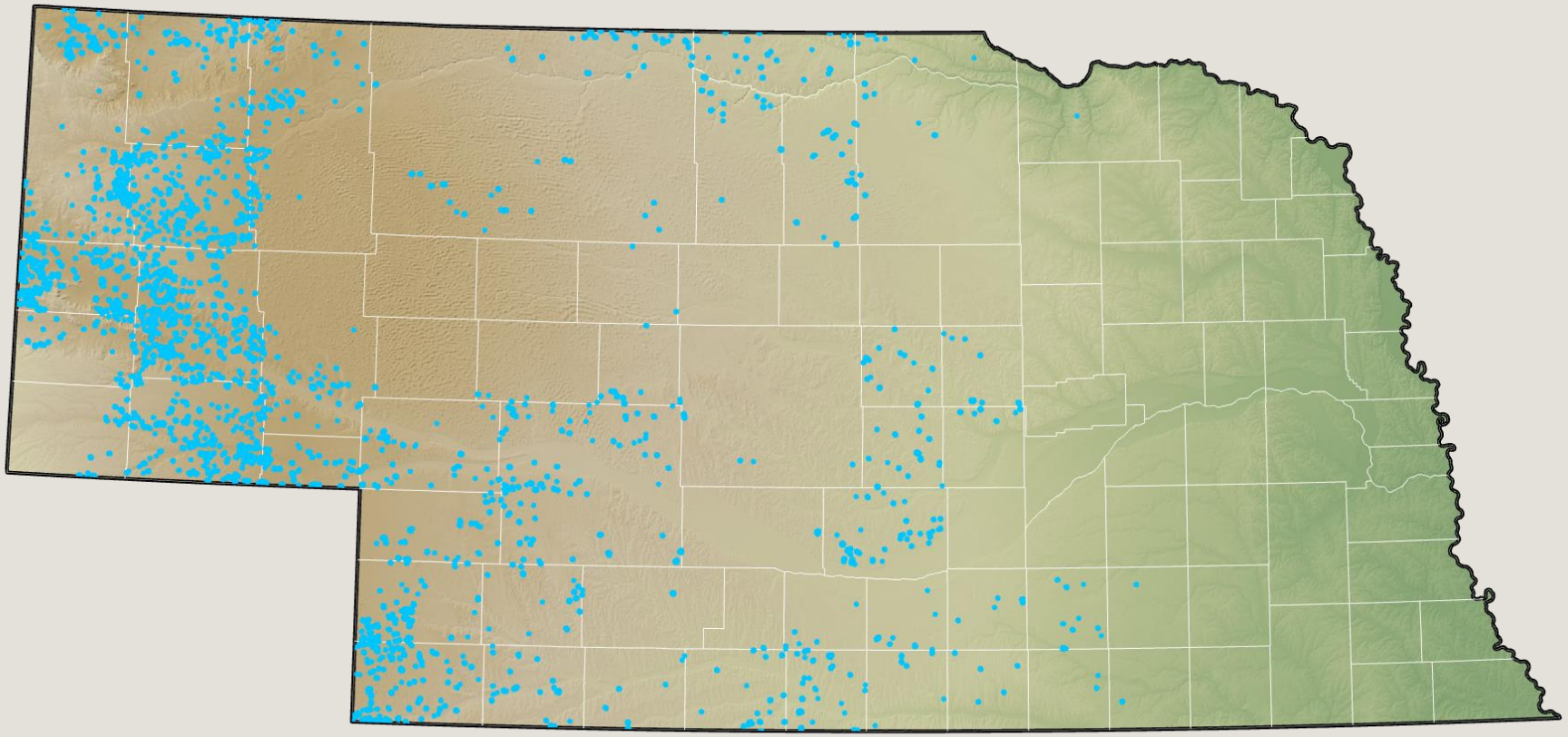
Habitat condition map developed by Justin Brei, Headwaters, and Andy Bishop, USFWS - HaPET/RWBJV (land status 2005, completed 2008).

Currently being used to analyze diurnal Whooping Crane habitat selection from 1995-2015. One publication currently available.



https://www.sciencebase.gov/catalog/item/60145254d34e162231fee76d

Nebraska Black-Tailed Prairie Dog Colony Delineation Using Aerial Photography (2010)



State-wide inventory of prairie dog colonies delineated using aerial imagery (land status 2010 completed 2013).

NGPC funded project using a published standard delineation method for the purpose of estimating BTPD population.

Potential remap currently being discussed.

https://www.sciencebase.gov/catalog/item/631baa38d34e71c6d67a2637

THANK *YOU*

Roger Grosse, RWBJV GIS Specialist
Roger_Grosse@fws.gov
www.rwbjv.org