# Integrating Agriculture into Rainwater Basin Wetland Management

Nebraska Natural Legacy Conference - October 2020

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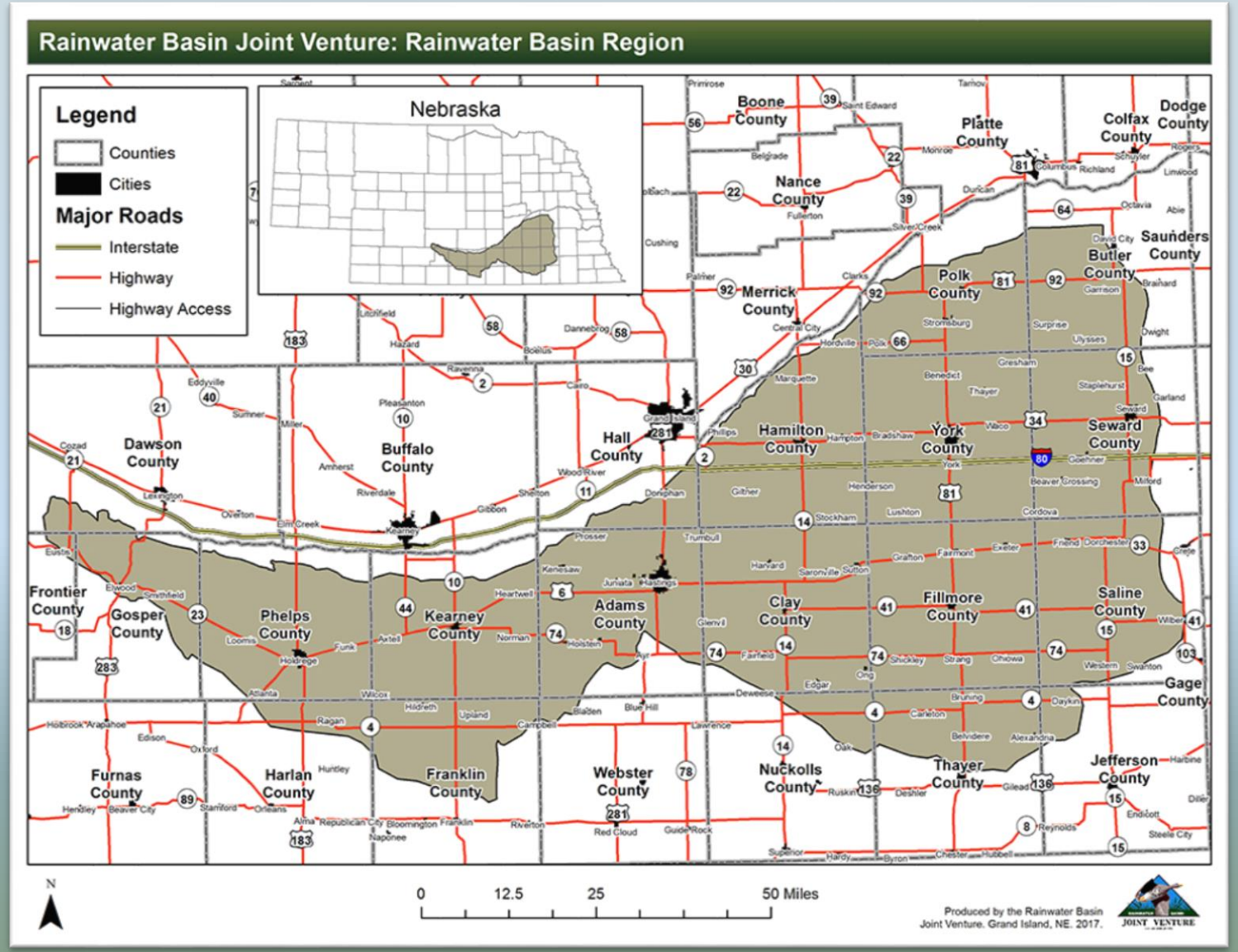
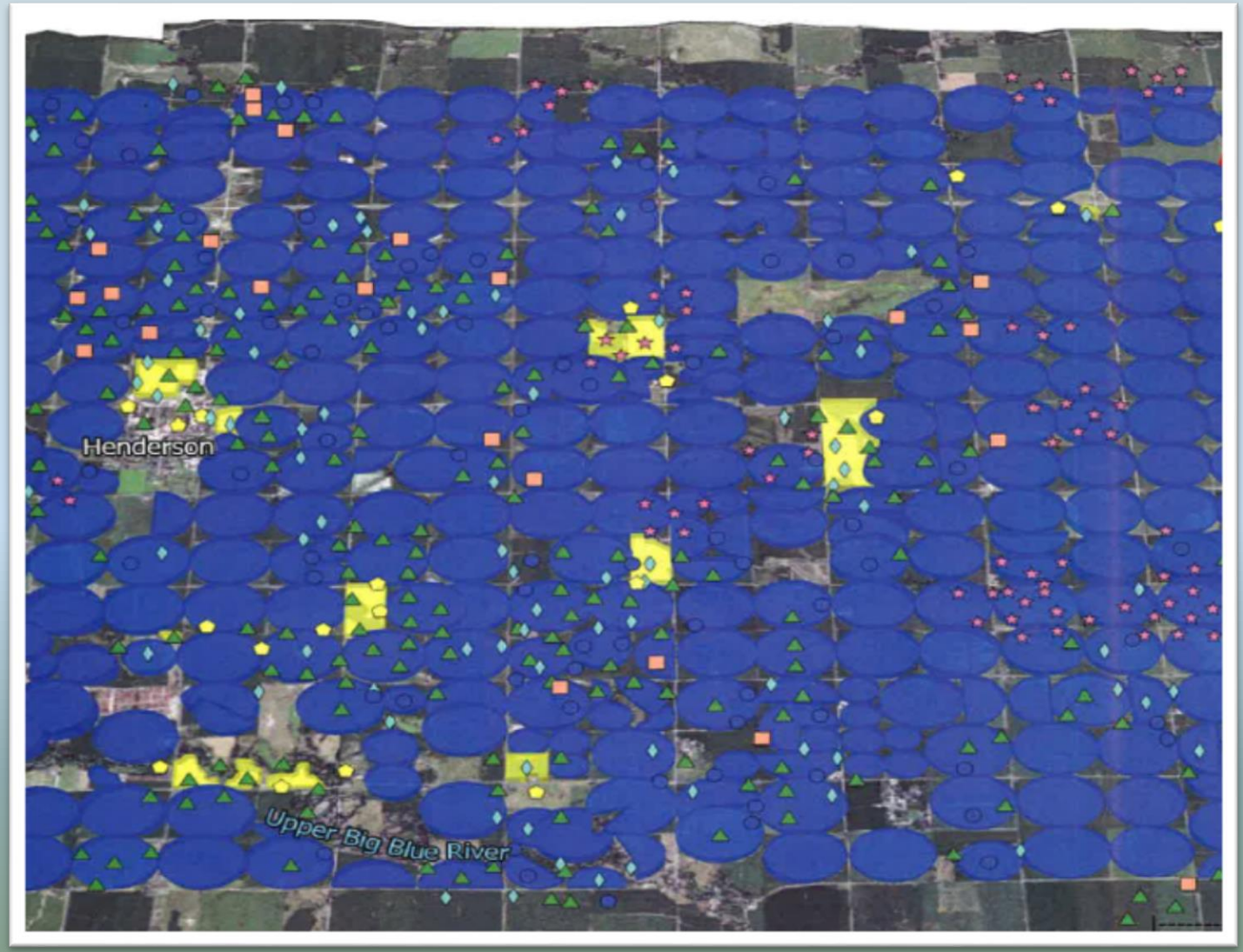
# Introduction to the RWB Landscape

- The RWB is a 6,150 square mile wetland complex in south-central Nebraska
- Contains expansive rolling loess plains formed by deep deposits of windblown silt with a high density of clay-pan playa wetlands
- Annually filled by overland runoff from intense summer storms and melting winter snowfall



# Introduction to the RWB Landscape

- Historically contained ~11,000 individual playa wetlands totaling ~204,000 acres
- Today, over 82% of the major wetlands have been converted to agriculture
- Playa wetlands comprise ~1% of the total Rainwater Basin landscape
- RWB wetlands were given a Priority 1 ranking, the most imperiled status, in the *Nebraska Wetlands Priority Plan*



# Introduction to the RWB Landscape

- Almost 99% of the lands within the RWB are under private ownership
- Land use dominated by row-crop agriculture
- Grasslands make up ~20% of the region, remainder being savannas, woodlands and forest communities

# Working Lands Initiative

- WRP – 1990 Farm Bill
  - Preserving wetlands is not enough – need to manage WRP/WREP easements

- Landowner enters a 10-year agreement that allows partners to work with the landowner to manage the wetland

- Conservation partners provide 85% cost-share for grazing infrastructure

- Eligibility Restrictions:
  - Must have ≥30 acres in a conservation program

# Working Lands Initiative

- In the past 10 years, the RWBJV has facilitated grazing infrastructure installation on 56 easements

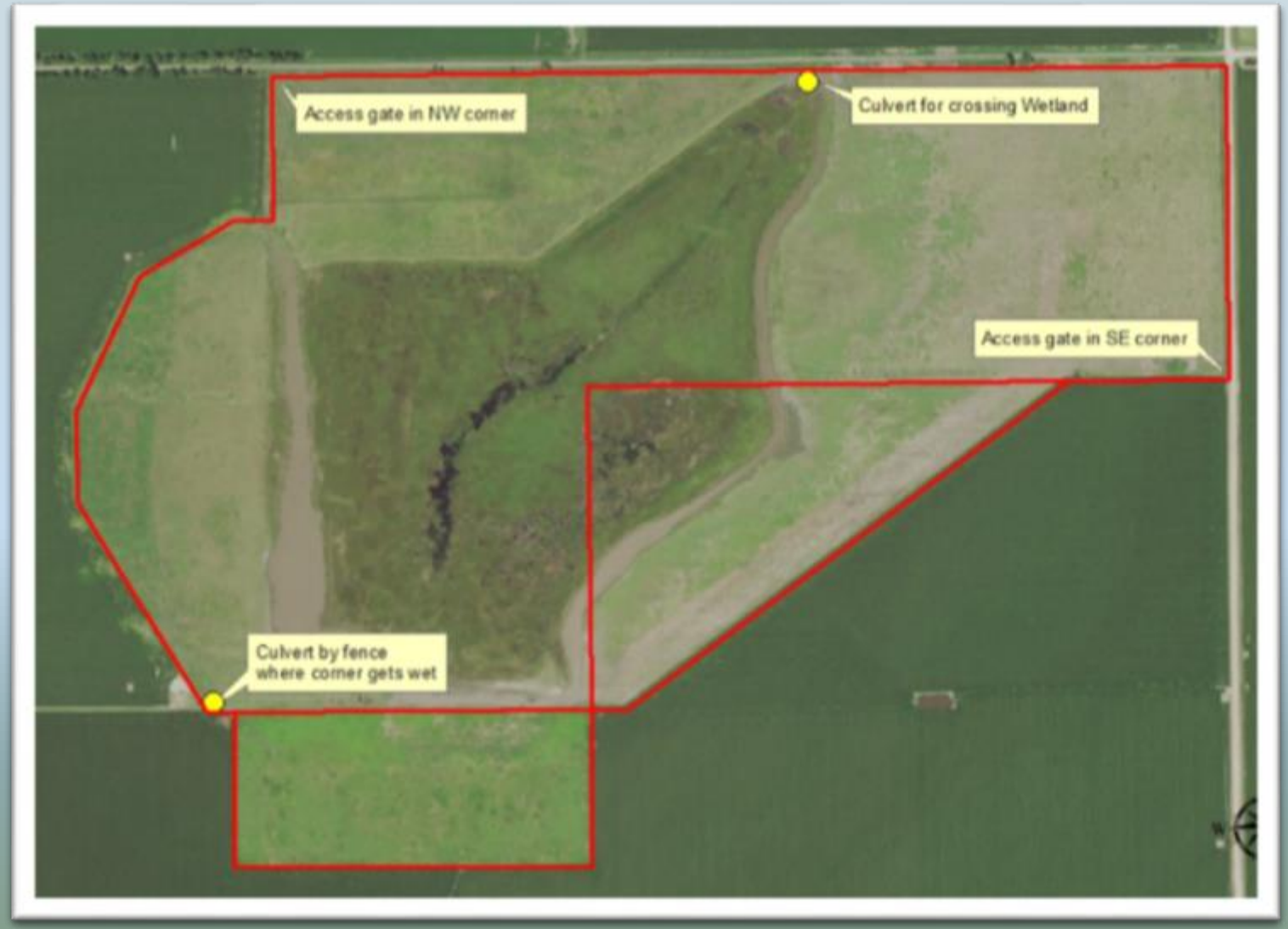
- Currently have 18 easements in various stages of construction
  - Most commonly funded projects include a perimeter fence and a solar well and livestock tanks

# Working Lands Initiative

- Projects can include any other work necessary to prepare an easement for grazing
    - Luttich WREP – Fillmore County

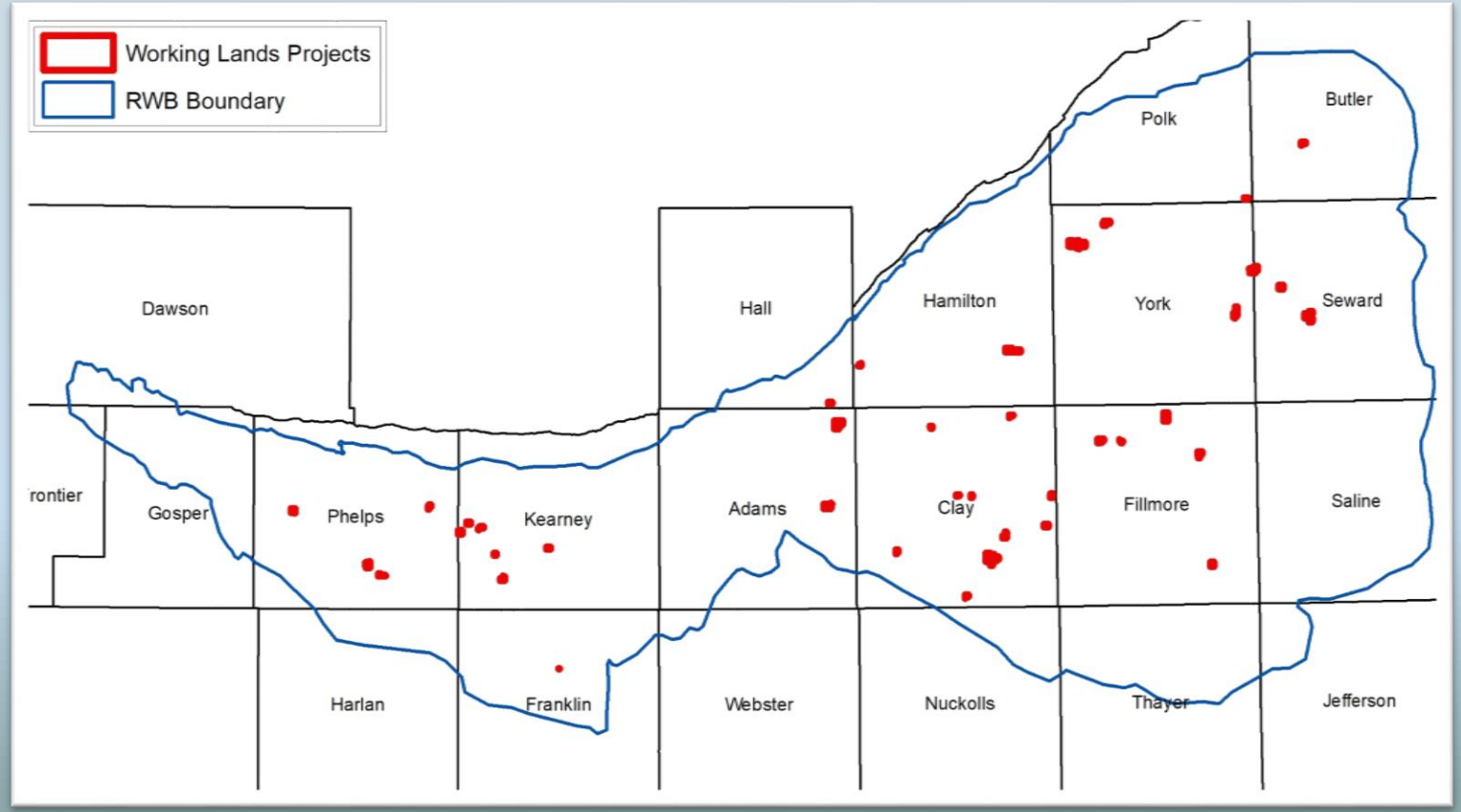
# Working Lands Initiative

- Projects can include any other work necessary to facilitate grazing on an easement
  - Olson WRP – Clay County
  - Hammond WRP – York County



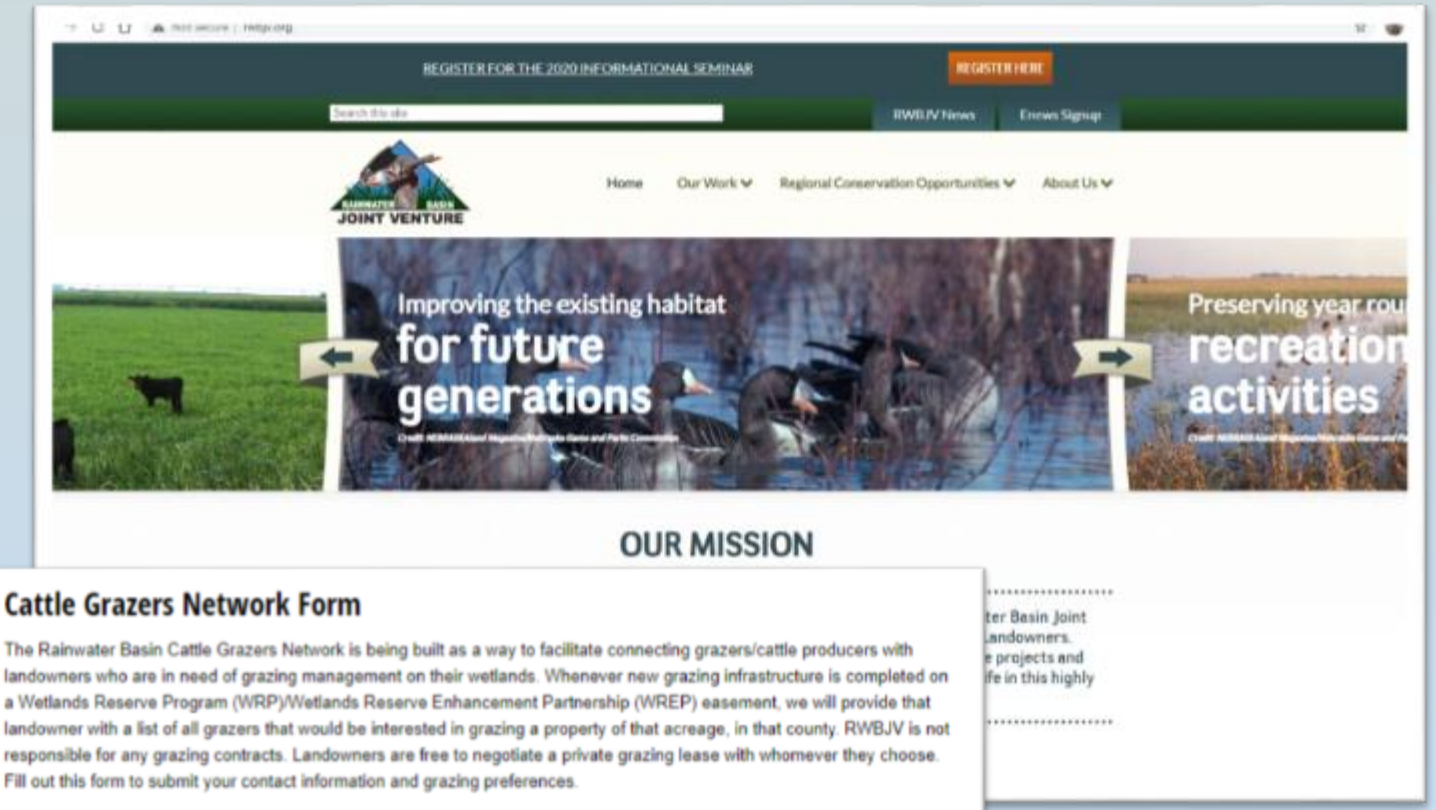
# Working Lands Initiative

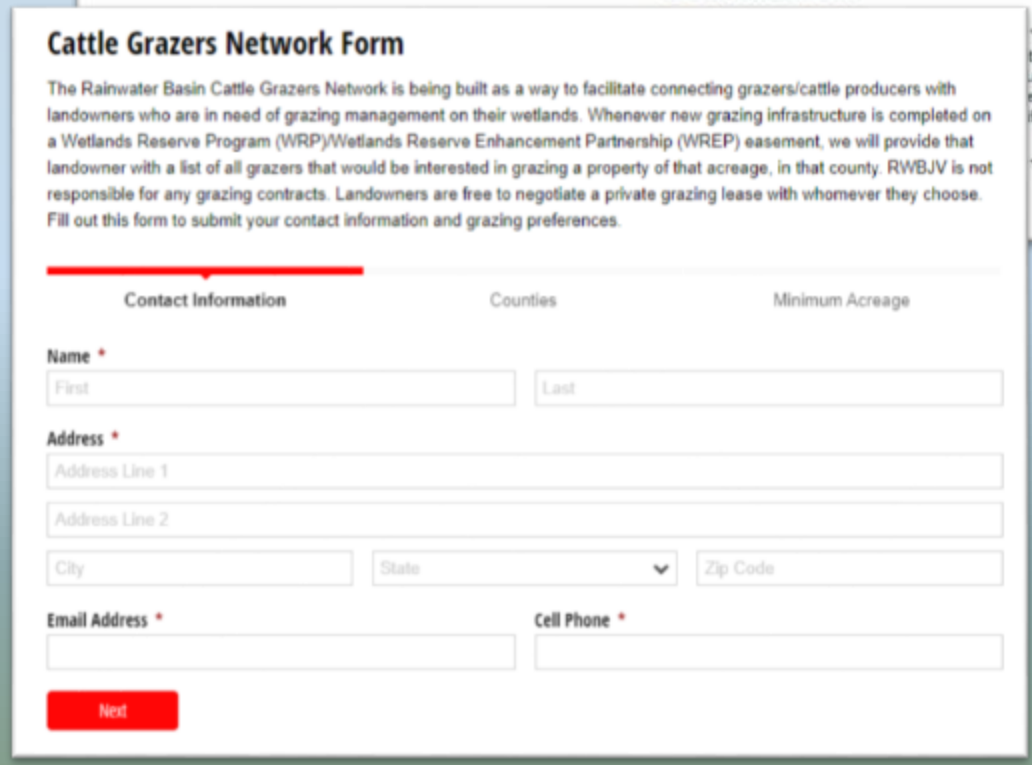
- Since 2010, over 56 private RWB wetlands have had grazing infrastructure installed
- These sites are scattered across 12 counties and total over 6,733 acres
- Many of these landowners do not have their own cattle and are looking for grazers to help them manage their wetlands



# Working Lands Initiative

- Cattle Grazers Register for the Network on the RWBJV Website
- Generate a list of available grazers for the easement owner based on location and # of acres
- Portable livestock corral



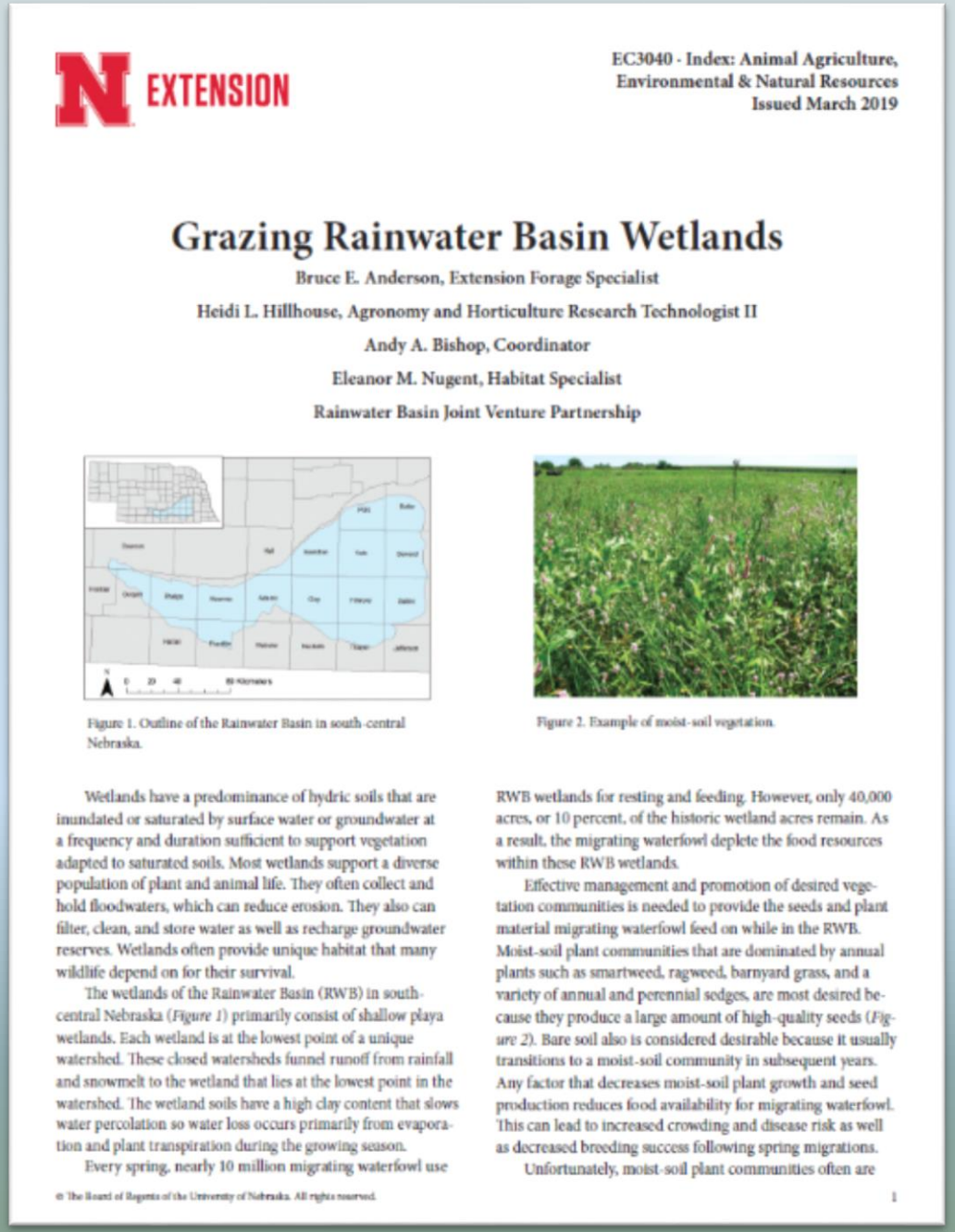



# Grazing RWB Wetlands

- Benefits of grazing
  - Increase suitable habitat for wetland dependent species - migratory waterfowl
  - Decrease undesirable species
  - Increase plant species diversity
  - Increase bare soil
  - Generates income for the easement landowner

- Use grazing as a disturbance to shift plant communities

- Wetlands can provide adequate nutrition for cattle



EXTENSION

EC3040 - Index: Animal Agriculture, Environmental & Natural Resources
Issued March 2019

## Grazing Rainwater Basin Wetlands

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Figure 1. Outline of the Rainwater Basin in south-central Nebraska.

Figure 2. Example of moist-soil vegetation.

Wetlands have a predominance of hydric soils that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support vegetation adapted to saturated soils. Most wetlands support a diverse population of plant and animal life. They often collect and hold floodwaters, which can reduce erosion. They also can filter, clean, and store water as well as recharge groundwater reserves. Wetlands often provide unique habitat that many wildlife depend on for their survival.

The wetlands of the Rainwater Basin (RWB) in south-central Nebraska (*Figure 1*) primarily consist of shallow playa wetlands. Each wetland is at the lowest point of a unique watershed. These closed watersheds funnel runoff from rainfall and snowmelt to the wetland that lies at the lowest point in the watershed. The wetland soils have a high clay content that slows water percolation so water loss occurs primarily from evaporation and plant transpiration during the growing season.

Every spring, nearly 10 million migrating waterfowl use RWB wetlands for resting and feeding. However, only 40,000 acres, or 10 percent, of the historic wetland acres remain. As a result, the migrating waterfowl deplete the food resources within these RWB wetlands.

Effective management and promotion of desired vegetation communities is needed to provide the seeds and plant material migrating waterfowl feed on while in the RWB. Moist-soil plant communities that are dominated by annual plants such as smartweed, ragweed, barnyard grass, and a variety of annual and perennial sedges, are most desired because they produce a large amount of high-quality seeds (*Figure 2*). Bare soil also is considered desirable because it usually transitions to a moist-soil community in subsequent years. Any factor that decreases moist-soil plant growth and seed production reduces food availability for migrating waterfowl. This can lead to increased crowding and disease risk as well as decreased breeding success following spring migrations.

Unfortunately, moist-soil plant communities often are

# Grazing RWB Wetlands – Reed Canarygrass

- Success depends on:
  - Proper stocking rate
  - Initiation of grazing at the proper time
  - Adequate recovery time after grazing
  - Use other management tools

- Graze RCG before it reaches 12” in height in the spring

- High density stocking rate & rotational grazing
  - Generally stock 1-1.5 AUM in early May through late July
  - Stock 1 – 1.5 AUM August - September

# Grazing RWB Wetlands – Cattails & River Bulrush

- High intensity for short duration
  - Cross fence small areas & move around
  - Stocking rates of 5-10 cow-calf pairs per acre for just a few days

- Timing is best in spring/early summer

- Utilize other management tools
  - Prescribed burning
  - Spraying chemical
  - Disking

    - May need nutrient supplementation for cattle

# Grazing RWB Wetlands – Moist-Soil Plant Communities

- Provides important forage due to crude protein percentage available
  - Comparable to other communities (e.g., reed canarygrass, river bulrush, etc.)

- Forage production lower then other plant communities
  - Stocking rate of 5-10 acres per cow-calf pair reasonable
  - Rotational graze with upland or other wetland vegetation communities

- Vary timing, intensity, and duration to promote diversity of species

# Grazing RWB Wetlands – Promote Moist-Soil Dominated Plant Communities

- Moist-soil plant communities shift to RCG, cattails, or bulrush less than 15% of the time following 1 year of moderate grazing

- Seed production is greater when moist-soil communities are grazed vs rested
  - Declines when grazing continues beyond mid-July
  - Conclude grazing early to maximize plant recovery and seed production

- Best management is to maintain community

# Grazing RWB Wetlands Summary

- It is important that you first determine your objectives
  - Grazing later in the season will increase species diversity, but it will not decrease RCG/cattails/bulrush

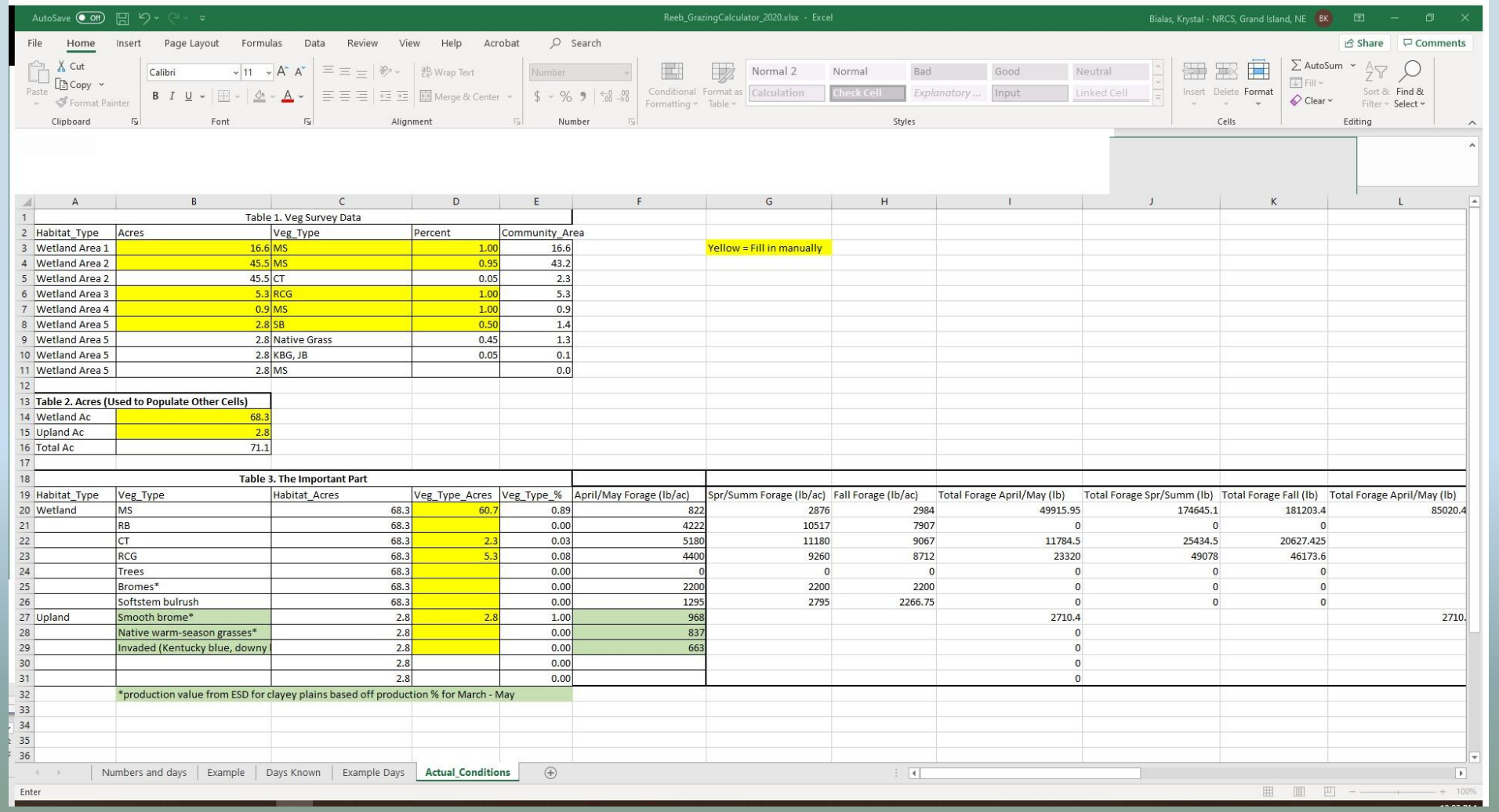
- Consider the nutritional needs of the cattle
  - Continuous stocking can cause severe stand loss, but it can also cause nutritional stress on cattle

# Grazing RWB Wetlands - Taking Action

1. Discuss goals and details.
2. Complete vegetation survey.
3. Create grazing plan.
4. Monitor and assess.
5. Additionally use other management strategies.

**Example: Reeb WRP – Fillmore Co.**

# Grazing RWB Wetlands- Plugging Data into Calculator



Reeb_GrazingCalculator_2020.xlsx - Excel

Table 1. Veg Survey Data

| Habitat_Type | Acres | Veg_Type | Percent | Community_Area |
|---|---|---|---|---|
| Wetland Area 1 | 16.6 | MS | 1.00 | 16.6 |
| Wetland Area 2 | 45.5 | MS | 0.95 | 43.2 |
| Wetland Area 2 | 45.5 | CT | 0.05 | 2.3 |
| Wetland Area 3 | 5.3 | RCG | 1.00 | 5.3 |
| Wetland Area 4 | 0.9 | MS | 1.00 | 0.9 |
| Wetland Area 5 | 2.8 | SB | 0.50 | 1.4 |
| Wetland Area 5 | 2.8 | Native Grass | 0.45 | 1.3 |
| Wetland Area 5 | 2.8 | KBG, JB | 0.05 | 0.1 |
| Wetland Area 5 | 2.8 | MS | | 0.0 |

Yellow = Fill in manually

**Table 2. Acres (Used to Populate Other Cells)**

| | |
|---|---|
| Wetland Ac | 68.3 |
| Upland Ac | 2.8 |
| Total Ac | 71.1 |

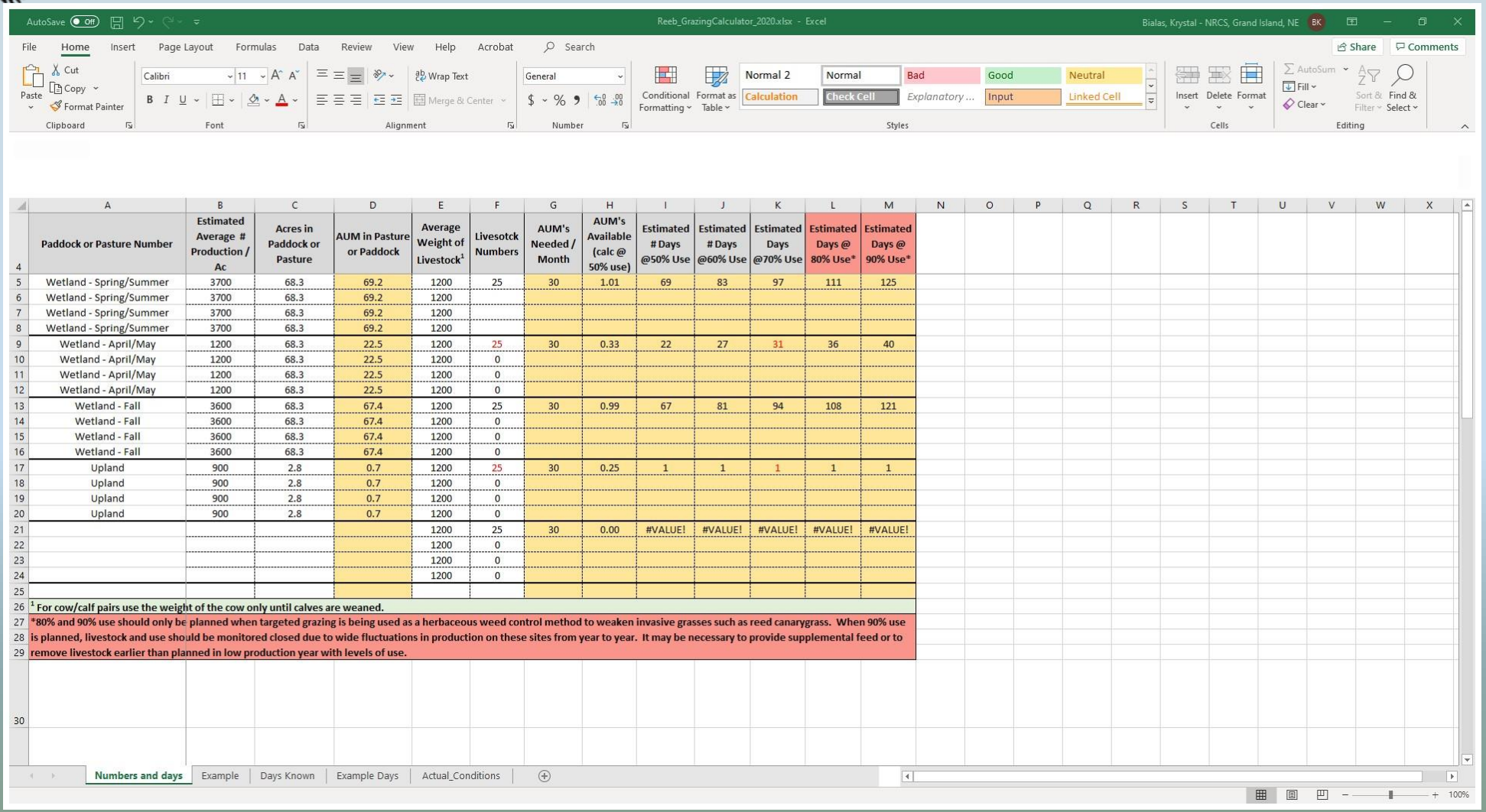
**Table 3. The Important Part**

| Habitat_Type | Veg_Type | Habitat_Acres | Veg_Type_Acres | Veg_Type_% | April/May Forage (lb/ac) | Spr/Summ Forage (lb/ac) | Fall Forage (lb/ac) | Total Forage April/May (lb) | Total Forage Spr/Summ (lb) | Total Forage Fall (lb) | Total Forage April/May (lb) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wetland | MS | 68.3 | 60.7 | 0.89 | 822 | 2876 | 2984 | 49915.95 | 174645.1 | 181203.4 | 85020.4 |
| | RB | 68.3 | | 0.00 | 4222 | 10517 | 7907 | 0 | 0 | 0 | |
| | CT | 68.3 | 2.3 | 0.03 | 5180 | 11180 | 9067 | 11784.5 | 25434.5 | 20627.425 | |
| | RCG | 68.3 | 5.3 | 0.08 | 4400 | 9260 | 8712 | 23320 | 49078 | 46173.6 | |
| | Trees | 68.3 | | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | Bromes* | 68.3 | | 0.00 | 2200 | 2200 | 2200 | 0 | 0 | 0 | |
| | Softstem bulrush | 68.3 | | 0.00 | 1295 | 2795 | 2266.75 | 0 | 0 | 0 | |
| Upland | Smooth brome* | 2.8 | 2.8 | 1.00 | 968 | | | 2710.4 | | | 2710. |
| | Native warm-season grasses* | 2.8 | | 0.00 | 837 | | | 0 | | | |
| | Invaded (Kentucky blue, downy | 2.8 | | 0.00 | 663 | | | 0 | | | |
| | | 2.8 | | 0.00 | | | | 0 | | | |
| | | 2.8 | | 0.00 | | | | 0 | | | |

*production value from ESD for clayey plains based off production % for March - May

Numbers and days | Example | Days Known | Example Days | Actual_Conditions

# Grazing RWB Wetlands- Determine Days & Cattle Numbers



| Paddock or Pasture Number | Estimated Average # Production / Ac | Acres in Paddock or Pasture | AUM in Pasture or Paddock | Average Weight of Livestock[1] | Livesotck Numbers | AUM's Needed / Month | AUM's Available (calc @ 50% use) | Estimated # Days @50% Use | Estimated # Days @60% Use | Estimated Days @70% Use | Estimated Days @ 80% Use* | Estimated Days @ 90% Use* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wetland - Spring/Summer | 3700 | 68.3 | 69.2 | 1200 | 25 | 30 | 1.01 | 69 | 83 | 97 | 111 | 125 |
| Wetland - Spring/Summer | 3700 | 68.3 | 69.2 | 1200 | | | | | | | | |
| Wetland - Spring/Summer | 3700 | 68.3 | 69.2 | 1200 | | | | | | | | |
| Wetland - Spring/Summer | 3700 | 68.3 | 69.2 | 1200 | | | | | | | | |
| Wetland - April/May | 1200 | 68.3 | 22.5 | 1200 | 25 | 30 | 0.33 | 22 | 27 | 31 | 36 | 40 |
| Wetland - April/May | 1200 | 68.3 | 22.5 | 1200 | 0 | | | | | | | |
| Wetland - April/May | 1200 | 68.3 | 22.5 | 1200 | 0 | | | | | | | |
| Wetland - April/May | 1200 | 68.3 | 22.5 | 1200 | 0 | | | | | | | |
| Wetland - Fall | 3600 | 68.3 | 67.4 | 1200 | 25 | 30 | 0.99 | 67 | 81 | 94 | 108 | 121 |
| Wetland - Fall | 3600 | 68.3 | 67.4 | 1200 | 0 | | | | | | | |
| Wetland - Fall | 3600 | 68.3 | 67.4 | 1200 | 0 | | | | | | | |
| Wetland - Fall | 3600 | 68.3 | 67.4 | 1200 | 0 | | | | | | | |
| Upland | 900 | 2.8 | 0.7 | 1200 | 25 | 30 | 0.25 | 1 | 1 | 1 | 1 | 1 |
| Upland | 900 | 2.8 | 0.7 | 1200 | 0 | | | | | | | |
| Upland | 900 | 2.8 | 0.7 | 1200 | 0 | | | | | | | |
| Upland | 900 | 2.8 | 0.7 | 1200 | 0 | | | | | | | |
| | | | | 1200 | 25 | 30 | 0.00 | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| | | | | 1200 | 0 | | | | | | | |
| | | | | 1200 | 0 | | | | | | | |
| | | | | 1200 | 0 | | | | | | | |

[1] For cow/calf pairs use the weight of the cow only until calves are weaned.

*80% and 90% use should only be planned when targeted grazing is being used as a herbaceous weed control method to weaken invasive grasses such as reed canarygrass. When 90% use is planned, livestock and use should be monitored closed due to wide fluctuations in production on these sites from year to year. It may be necessary to provide supplemental feed or to remove livestock earlier than planned in low production year with levels of use.

Numbers and days | Example | Days Known | Example Days | Actual_Conditions

# Thank You!

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*Grazing Rainwater Basin Wetlands*
https://extensionpubs.unl.edu/

- Major Funding Partners:
  - NRCS
  - RWBJV
  - USFWS – PFW
  - NGPC
  - Ducks Unlimited
  - Lindsay Corporation