

Range Topic

**Teacher Training for Envirothon
Grand Island, NE January 8, 2018**



Information Sources

- Nebraska Envirothon Website
 - https://www.nrdnet.org/sites/default/files/range_study_guide_2016.pdf
- Nebraska Range Judging Handbook
 - <http://extensionpublications.unl.edu/assets/pdf/ec150.pdf>
 - <http://www.nesrm.org/RangeJudging.html>
- Sampling Vegetation Attributes
 - <https://www.blm.gov/nstc/library/pdf/samplveg.pdf>
- Prescribed Burning
 - <http://extensionpublications.unl.edu/assets/pdf/ec121.pdf>
- Rangeland Health
 - <https://www.blm.gov/nstc/library/pdf/1734-6rev05.pdf>

Critical to Know

- Extent of rangeland in NE (Western US)
- Vegetation Types in NE
- Characteristics of rangeland vegetation
 - *Life Form*
 - *Growth Form*
 - *Lifespan*
 - *Origin*
 - *Season of Growth*
 - *Poisonous*
- Ecological Sites
 - *Describe*
 - *Identify*



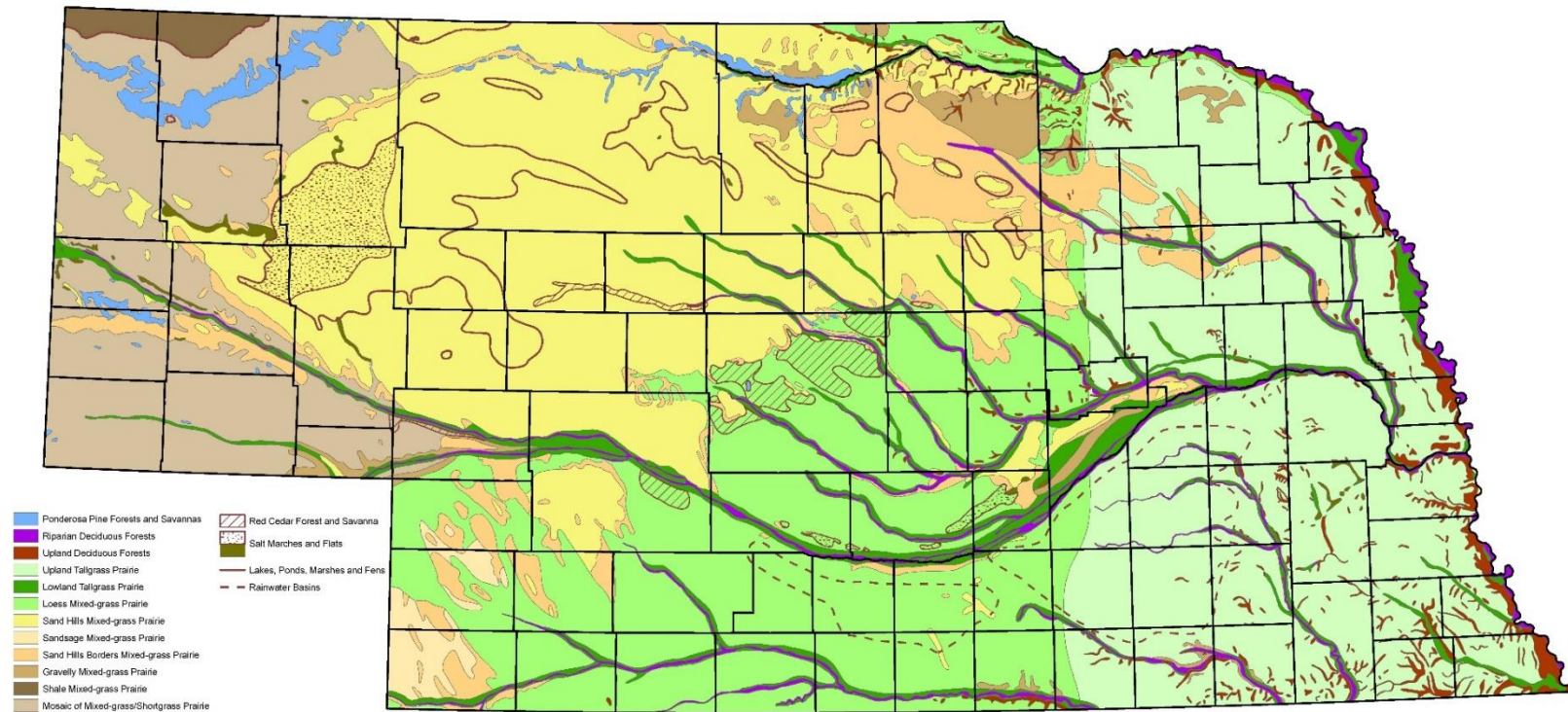
Critical to Know

- Succession
- State and Transition Models
- Role of fire in ecosystems
 - <https://www.fs.fed.us/nrs/highlights/2012/images/map-fire-freq.jpg>
- Stocking Rates
- Range Management Practices
 - *Seeding*
 - *Water Development*
 - *Brush Management*
 - *Weed Control*
 - *Prescribed Fire*
 - *Grazing Systems*



Native Vegetation Types of Nebraska

Native Vegetation

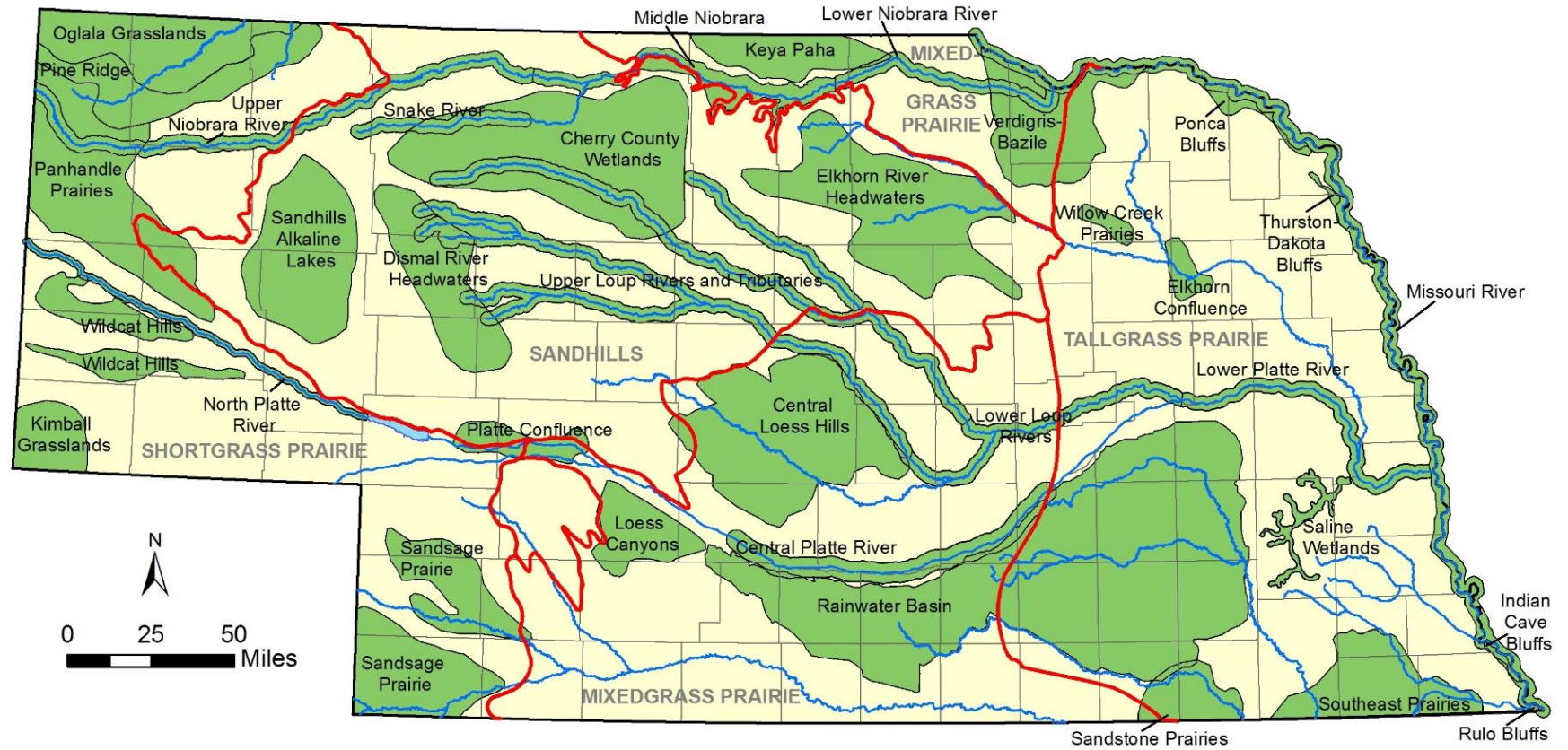






Native Vegetation Types of Nebraska

- <http://snr.unl.edu/csd-esic/gisutmstp/images/native.jpg>



Nebraska Natural Legacy Project: Biologically Unique Landscapes



-  River
-  County Boundary
-  Ecoregion Boundary
-  Biologically Unique Landscape



<http://outdoornebraska.gov/naturallegacyproject>

The Nebraska Natural Legacy Project

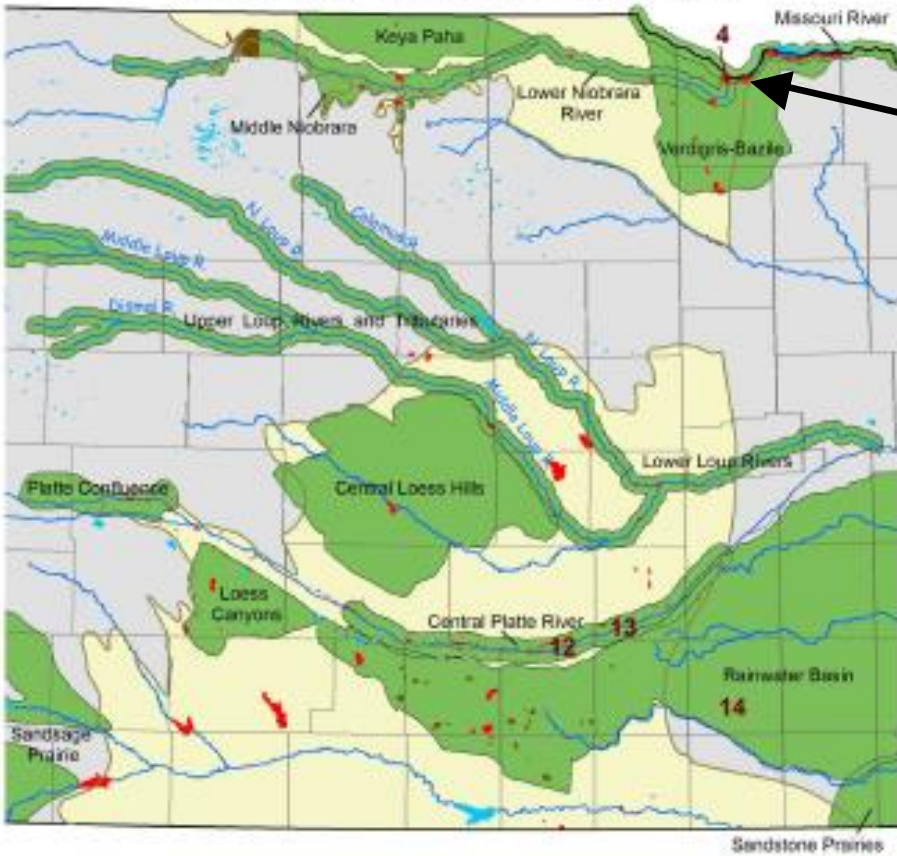


State Wildlife Action Plan

2nd edition

2011

Nebraska Natural Legacy Project: Mixedgrass Prairie Ecoregion



Niobrara State
Park

Niobrara State Park



Verdigre-Bazille Creek BUL

■ Rangeland Stresses:

- *Invasive Species: Purple Loosestrife, Reed Canarygrass, Euroasian phragmites, Kentucky Bluegrass, Smooth Bromegrass, Garlic Mustard*
- *Woody encroachment: Russian olive, Eastern Red Cedar*
- *Grazing/haying: Management strategies that reduce plant diversity*
- *Land Use Conversion: Grassland to cropland*

■ Tier I Plant Species

- *Prairie Moonwort*

Ecological Sites

- Use the Nebraska Range Judging Handbook for sites that could be on the contest.
 - *Know information about the sites*
 - *Be able to identify the potential sites at the contest*
 - *Use Web Soil Survey for information about Ecological Sites present.*

Web Soil Survey -

<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>



USDA United States Department of Agriculture
Natural Resources Conservation Service

Web Soil Survey

Home About Soils Help Contact Us

You are here: Web Soil Survey Home


Search

All NRCS Sites

Browse by Subject

- Soils Home
- National Cooperative Soil Survey (NCSS)
- Archived Soil Surveys
- Status Maps
- Official Soil Series Descriptions (OSD)
- Soil Series Extent Mapping Tool
- Geospatial Data Gateway

The simple yet powerful way to access and use soil data.



Welcome to Web Soil Survey (WSS)



Web Soil Survey (WSS) provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world. NRCS has soil maps and data available online for more than 95 percent of the nation's counties and anticipates having 100 percent in the near future. The site is updated and maintained online as the single authoritative source of soil

I Want To...

- **Start Web Soil Survey (WSS)**
- **Know Web Soil Survey Requirements**
- **Know Web Soil Survey operation hours**
- **Find what areas of the U.S. have soil data**
- **Find information by topic**
- **Know how to hyperlink from other documents to Web Soil Survey**
- **Know the**

Area of Interest (AOI) | Soil Map | Soil Data Explorer | Download Soils Data | Shopping Cart (Free)

Search

Area of Interest

Import AOI

Quick Navigation

Address

State and County

View

State:

County (optional):

View

Soil Survey Area

Latitude and Longitude or Current Location

PLSS (Section, Township, Range)

Bureau of Land Management

Department of Defense

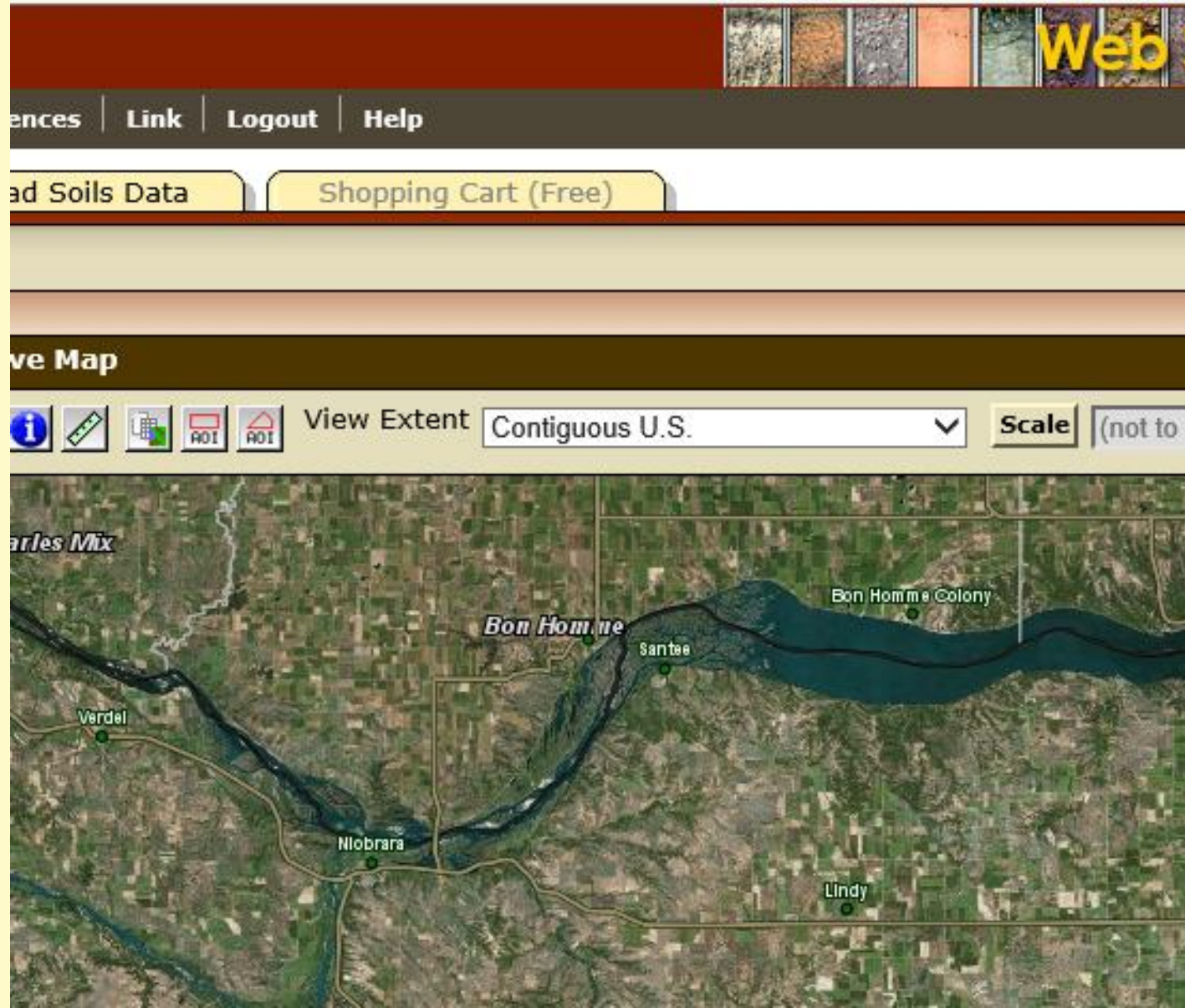
Area of Interest Interactive Map

Legend

View Extent: Scale:

Web Soil Survey -

<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>



ive Map



View Extent

Contiguous U.S.



Scale

(not to s



Web Soil Survey - Soil Map

Area of Interest (AOI)

Soil Map

Soil Data Explorer

Download Soils Data

Shopping Cart (Free)

Printable Version

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Search

Map Unit Legend

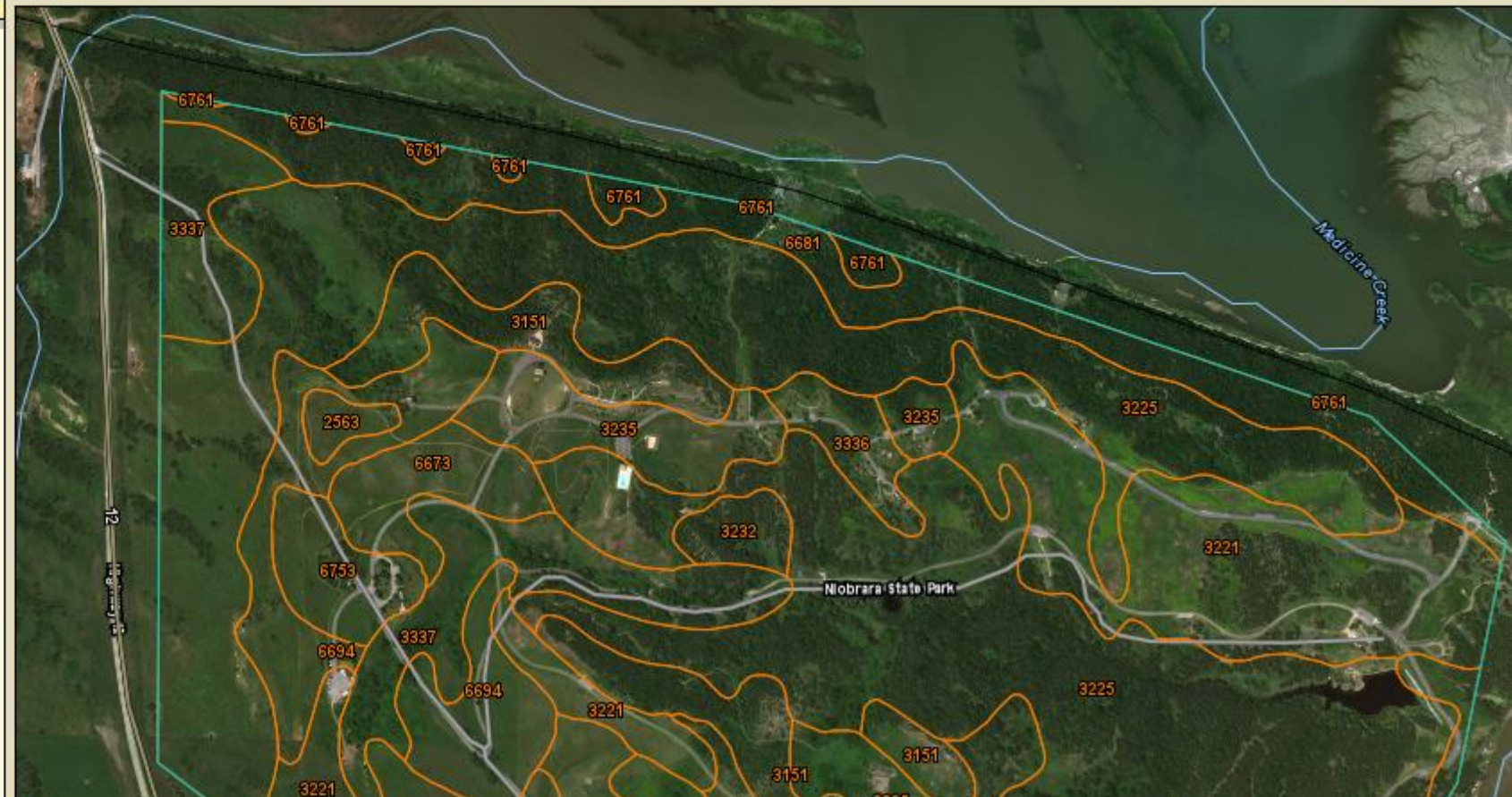
Knox County, Nebraska (NE107)

Knox County, Nebraska (NE107)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2563	Eltree silt loam, 3 to 6 percent slopes	3.7	0.5%
3151	Bristow silty clay, 30 to 60 percent slopes	59.0	7.8%
3221	Labu silty clay, 6 to 11 percent slopes	104.0	13.7%
3225	Labu-Sansarc silty clays, 9 to 35 percent slopes	323.1	42.5%

Soil Map

Legend  Scale (not to scale)



Web Soil Survey - Soil Data Explorer

Area of Interest (AOI) **Soil Map** Soil Data Explorer Download Soils Data Shopping Cart (Free)

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Search

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Knox County, Nebraska (NE107)

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Soil Map

Legend

Scale (not to scale)

Web Soil Survey - Sites that would occur Niobrara State Park

- Shallow (Shallow and Shallow Limy)
- Loamy Upland (Loamy, Loamy Upland, Silty)
- Clayey
- Limy Upland (Limy Upland, Thin Upland)
- Sandy



Plants – Things to Know



Stocking Rates – Balance Between Forage Production and Animal Demand

AUM = Animal Unit Month

Pounds of forage that an Animal Unit will consume in 30 days (equals 26# / day)

An Animal Unit = -1000# cow with a calf <3 months of age

A 1250 # cow with young calf = 1.25 AU. The AU should be increased as the calf ages.

A steer/yearling/stocker weighing 650 pounds = 0.65 AU



Stocking Rates: Forage and Animal Demand Balance

- Problems can be set up to solve for:
- Number of Animals that can safely graze a land unit
- Number of Months a herd can safely graze a land unit
- Amount of forage (AUMs) needed to graze a herd for a given amount of time if size of animals, number of months of grazing number of animals is known.
- Amount of land need if a known amount of forage is produced and the above information is known.

Forage and Animal Demand Balance

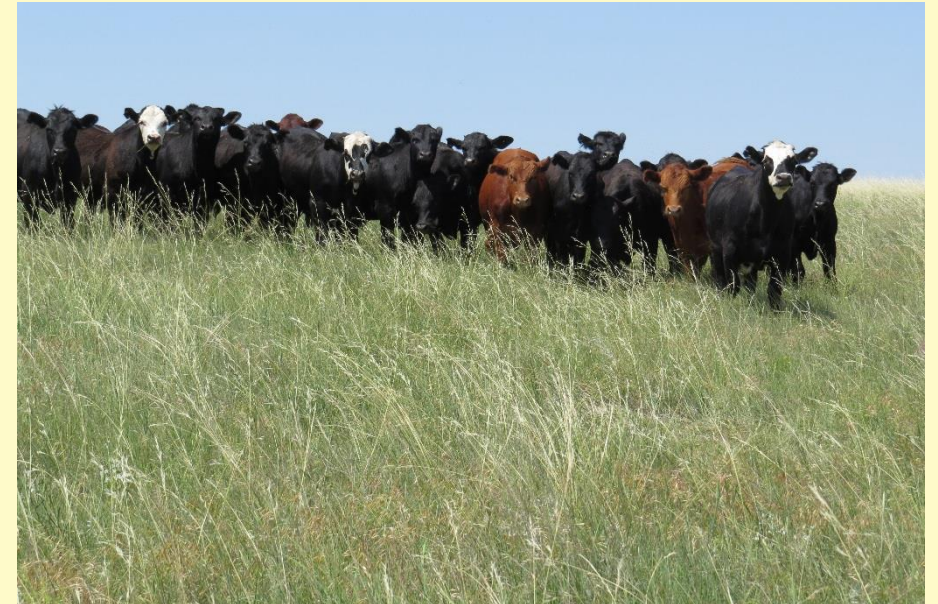
$$A * U * M = AUM$$

Problems can be set up to solve for:

- Number of Animals that can safely graze a land unit
- Number of Months a herd can safely graze a land unit
- Amount of forage (AUMs) needed to graze a herd for a given amount of time if size of animals, number of months of grazing number of animals is known.
- Amount of land need if a known amount of forage is produced and the above information is known.

Example Stocking Rate Problem #1 – Part A

- Cow herd consists of 100 cow/calf pair
 - *Calving date is April 1*
- Cows weigh an average of 1200 pounds
- Grazing period is April 1 – June 30
- How many AUM's are needed to support this herd?



Example Stocking Rate Problem #1 Part A

- Cow herd consists of 100 cow/calf pair
 - *Calving date is April 1*
- Cows weigh an average of 1200 pounds
- Grazing period is April 1 – June 30
- How many AUM's are needed to support this herd?

100 Animals X 1.2 Units X 3 months = 360 AUM



Example Stocking Rate Problem #1 Part B

100 Animals X 1.2 Units X 3 months = 360 AUM needed.

The pasture available produces an average of 0.6 AUM/AC. How many acres of pasture is needed to support this herd for 3 months?

$360 \text{ AUM} / 0.6 \text{ AUM/AC} = 600$ acres averaging 0.6 AUM/AC are needed to support 100 cows weighing 1200 pounds for 3 months.

Example Stocking Rate Problem #2

100 Cow/calf pairs

1300 # cows

Calving date = February 1

Grazing Season = May 15 – October 15 (5 months)

The Rancher owns 800 acres of rangeland which averages 0.75 AUM/Ac.
Should the stocking rate be increased, decreased or remain the same?

Example Stocking Rate Problem #2

100 Cow/calf pairs

1300 # cows

Calving date = February 1 - Calves AU value = 0.25

Grazing Season = May 15 – October 15 (5 months)

The 800 acres of rangeland averages 0.75 AUM/Ac. Should the stocking rate be increased, decreased or remain the same?

$100 \text{ A} \times 1.55 \text{ U} \times 5 \text{ M} = 775 \text{ AUM}$ needed

$800 \text{ AC} \times 0.75 \text{ AUM/AC} = 600 \text{ AUM}$ available

DECREASE Stocking Rate (22.5% overstocked)

Range Seedings – Pure Live Seed vs. Bulk Seed

Pure Live Seed – Purity and Germination of seed to be planted

Species	PLS Pounds/ac Needed	% Purity	% Germination	Bulk Pounds / ac Needed
Big Bluestem	1.0	70	80	1.79
Switchgrass	0.3	95	90	0.35
Sideoats Grama	0.5	80	70	0.89
Indiangrass	0.8	65	90	1.37
Total # / AC Needed	2.6			4.4

Range Seeding Problem

If 50 acres are to be seeded to grass, how many bulk pounds of the following seed should be purchased?

Species	PLS Pounds/ac Needed	% Purity	% Germination	Bulk Pounds / ac Needed	Total Bulk Pounds Seed Needed
Big Bluestem	1.0	70	80	1.79	89.5
Switchgrass	0.3	95	90	0.35	17.5
Sideoats Grama	0.5	80	70	0.89	44.5
Indiangrass	0.8	65	90	1.37	68.5
Total # / AC Needed	2.6			4.4	220

Monitoring:

Line Point Intercept

Modified Step Point

Ten Pin Frame

Daubenmire Frame

Robel Pole

Total Production

Total Forage Production

Plant Census





Eastern Red Cedar Literacy Project:

cedarliteracy.unl.edu

