

Ag Land Valuation Issue

Low / Varying Quality Grasslands

Jerry Green
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LCG Assignment Issue

(LCG - Land Capability Grouping)

- TERC Awareness Needed of Underlying Issue w/
Grassland Classifications and Resulting Valuations

LCG Assignments are ***SIGNIFICANTLY FLAWED***

- Neb Dept. of Revenue's LCGs assignments are arbitrary and meaningless
- Three problems created by flawed LCG assignments
 1. Distorted "Comparable Sales"
 2. Arbitrary valuation due to arbitrary LCG assignment
 3. Severely misleading information to the public

Presentation Purpose

- Grassland Valuation Issue
 - Arbitrary LCG soil classification assignments
 - Morrill County focus
 - Systemic issue – broader than Morrill County
- Impact of Arbitrary LCG Assignments
- Proposal to Use NRCS Rangeland Productivity Ratings to Set Valuations for Grassland
 - Straightforward approach
 - Ensures taxes levied "***proportionately***"

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Jerry Green Credentials

- Academic Career
 - BS Agricultural Engineering, 1979, Univ. of Neb Lincoln
 - MS Mechanical Engineering, 1986, Iowa State Univ.
 - PhD Mechanical Engineering, 1992, Univ. of Wis Madison
- Professional Career – John Deere Power Systems
 - Engineer – 1979
 - Specialized in predictive model development and application
 - Engine Design Analysis Technical Specialist – 1992
 - Specialized in high level analysis support
 - Manager Design and Performance Technology – 2002
 - Managed a team with up to 39 worldwide staff to support JD Power Systems analytical needs

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Jerry Green Credentials

- Academic and Career Focus
 - Predictive model development
 - Data analysis
 - Statistics
 - Data interpretation
 - System integration
 - Accuracy a career necessity

MIPS Inc.		Real Property Break Down.		05/21/2012					
Technology Services Division of NACO		Morrill County Assessor		01:28:03PM					
200042265 GREEN, RICHARD R & BETTY L				PAGE 1 OF 1					
PARCEL ID #: 0200042265		MAP #:							
OWNER NAME AND ADDRESS		CURRENT VALUATION		CURRENT MARKET					
GREEN, RICHARD R & BETTY L		Dwell/Bldgs:							
TRUSTEES		Other Improv:		Market Value:					
ASSISTED LIVING, RM 211		Land/Lots:		140,140					
7511 UNIVERSITY AVENUE		Total Valuation:		140,140					
CEDAR FALLS, IA 50613									
		PREVIOUS VALUATION		PREVIOUS MARKET					
		Dwell/Bldgs:							
		Other Improv:		Market Value:					
		Land/Lots:		121,250					
		Total Valuation:		121,250					
Tax District: 156		41-B-3821							
Base School: 62-0021									
Affiliation:									
Unification:									
County Area: 2									
Situs Address:									
NDR Class Codes: 02 05 00 03 00 10									
CEO Code: 1653-35									
Cadastral: 1 - - - - -44									
Legal Description: S-T-R: 35-23-52 ACRES: 640 ALL									
Sym	Use	LVG	Spot Adjust	Acres	Value/Acre	Total Value	Sub Market/Acre	Market Value	Sub
5144	GRAS	4G	N	17.000	220	3,740			
5851	GRAS	4G	N	11.000	220	2,420			
5910	GRAS	3G	N	22.000	220	4,840			
6025	GRAS	4G	N	386.000	220	84,920			
6033	GRAS	4G	N	291.000	220	44,220			
GRAS Sub Total:				637.000		140,140			
ROAD	ROAD	ROAD	N	3.000					
ROAD Sub Total:				3.000					
Grand Total:				640.000		140,140			
Year	Stmnt #	Dist	Building	Other Imp	Land Value	Total Val	Exempt Val	Taxable Val	Total Tax
2011	2459	156			121,250	121,250		121,250	2,160.34
2010	2474	156			121,250	121,250		121,250	2,180.08
2009	2450	156			114,660	114,660		114,660	2,112.30
2009	2437	156			58,210	58,210		58,210	1,196.70
2007	2439	156			58,210	58,210		58,210	1,136.14
2006	2426	156			57,770	57,770		57,770	1,193.02
2005	2418	156			51,620	51,620		51,620	1,005.98
2004	2413	156			51,620	51,620		51,620	994.16
2003	2657	156			51,620	51,620		51,620	499.26
*** End Of Report ***									

Real Property Breakdown Soil/Valuation Table

Legal Description: T-R: 35-23-52 ACRES: 640 A

Sym	Use	LVG	Spot Adjust	Acres	Value/Acre	Total Value
5144	GRAS	4G	N	17.000	220	3,740
5851	GRAS	4G	N	11.000	220	2,420
5910	GRAS	3G	N	22.000	220	4,840
6025	GRAS	4G	N	386.000	220	84,920
6033	GRAS	4G	N	201.000	220	44,220
GRAS Sub Total:				637.000		140,140
ROAD	ROAD	ROAD	N	3.000		
ROAD Sub Total:				3.000		
Grand Total:				640.000		140,140

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LCG Grassland Classifications

Neb Admin Code Title 350 Chapter 14, 4.08H(9) -4.08H(16)

- 1G1 – Grassland and meadows generally capable of producing very high yields of forage.
- 1G – Grassland and meadows generally capable of producing high yields of forage.
- 2G1 – Grassland and meadows generally capable of producing moderately high yields of forage.
- 2G – Grassland and meadows generally capable of producing above average yields of forage.
- 3G1 – Grassland and meadows generally capable of producing average yields of forage.
- 3G – Grassland and meadows generally capable of producing moderately low yields of forage.
- 4G1 – Grassland and meadows generally capable of producing low yields of forage.
- 4G – Grassland and meadows generally capable of producing very low yields of forage.

Soil Plot

Soil Plot 2


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Dept. of Revenue Data

- LCG – Land Capability Groupings
 - Groups of soils similar in productivity
 - Set by Dept. of Revenue, Prop Assessment Division(PAD)
 - Based on NRCS data

CONVERSION FROM OLD SOIL SYMBOLS TO NEW NUMERIC SYMBOLS									
12/17/09	COUNTY	OLD SYMBOL	OLD NAME	NEW SYMBOL	NEW NAME	NEW ACRE COUNTS	CAPABILITY GROUPINGS		
							DRY	IRR	GRS
	MORRILL	Bc	Bankard fine sand, channeled	1001	Bankard fine sand, channeled, frequently flooded	13,871.2	4D	4A	4G
	MORRILL	Ba	Bankard loamy coarse sand, 0 to 2 percent slopes	1002	Bankard loamy coarse sand, occasionally flooded	1,417.6	4D1	4A1	4G1
	MORRILL		This map unit was added to the soil survey from an adjacent county for joining purposes.	1006	Bankard loamy fine sand, channeled, frequently flooded	1,549.2	4D	4A	4G
	MORRILL		This map unit was added to the soil survey from an adjacent county for joining purposes.				2D	2A	2G
	MORRILL	Gs	Glenberg very fine sandy loam, 0 to 2 percent slopes			5,463.4	2D	2A	2G
	MORRILL	Gr	Glenberg loamy fine sand, 0 to 2 percent slopes			1,544.4	3D	3A	3G
	MORRILL	Bb	Bankard loamy fine sand, 0 to 2 percent slopes	1114	Bankard loamy fine sand, occasionally flooded	3,967.3	3D	3A	3G

Today's Discussion Focus
on Grassland
1G1 through 4G



NRCS Data

- NRCS Soil Survey
 - Soil Maps
 - Countywide surveys
 - Individual parcels through AOI (Area of Interest)
 - Vegetative Productivity
 - Range Production rating (normal year)
 - Output pounds per acre per year
 - Linear conversion to AUM (Animal Unit Month)
 - » 750 lbs/month per 1000 lb cow
 - » 25% grazing efficiency

USDA Department of Agriculture
Natural Resources Conservation Service

Web Soil Survey

Contact Us | Subscribe | Archived Soil Surveys | Soil Survey Status | Glossary | Preferences | Link | Logout | Help

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

View Soil Information By Use: All Uses | Printable Version | Add to Shopping Cart

Intro to Soils | **Suitabilities and Limitations for Use** | Soil Properties and Qualities | Ecological Site Assessment | Soil Reports

Search

Suitabilities and Limitations Ratings

Open All | Close All

- Building Site Development
- Construction Materials
- Disaster Recovery Planning
- Land Classifications
- Land Management
- Military Operations
- Recreational Development
- Sanitary Facilities
- Vegetative Productivity**
 - Crop Productivity Index
 - Forest Productivity (Cubic Feet per Acre per Year)
 - Forest Productivity (Tree Site Index)
 - Iowa Corn Suitability Rating (CSR2)
 - Range Production (Favorable Year)
 - Range Production (Normal Year)**

View Options

Map | Table | Description of Rating | Rating Options Detailed Description

Advanced Options

View Description | View Rating

Map — Range Production (Normal Year)

Warning: Soil Ratings Map may not be valid at this scale.

Tables — Range Production (Normal Year) — Summary By Map Unit

Summary by Map Unit — Morrill County, Nebraska (NE123)

Map unit symbol	Map unit name	Rating (pounds per acre per year)	Acres in AOI	Percent of AOI
5851	Mitchell-Epping very fine sandy loams, 9 to 20 percent slopes	1060	59.4	18.7%
6025	Tassel loamy very fine sand, 20 to 50 percent slopes	700	195.0	61.2%
6033	Tassel-Busher loamy very fine sands, 3 to 30 percent slopes	1060	64.2	20.2%
Totals for Area of Interest			318.6	100.0%

LCG Review

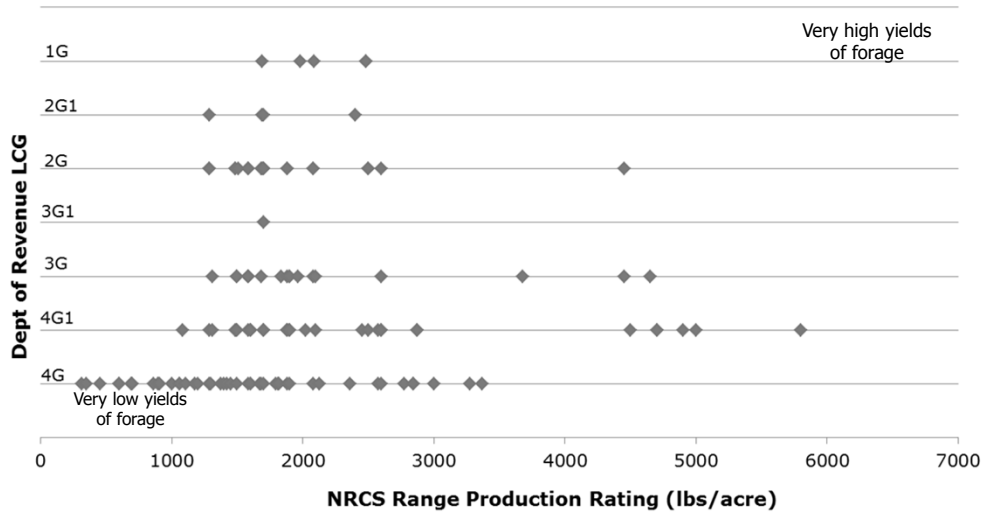
LCG vs NRCS Rangeland Productivity Rating

CONVERSION FROM OLD SOIL SYMBOLS TO NEW NUMERIC SYMBOLS							NRCS Rangeland Prod. (lbs/acre) (normal year)		
COUNTY	OLD SYMBOL	OLD NAME	NEW SYMBOL	NEW NAME	NEW ACRE COUNTS	CAPABILITY GROUPINGS DRY IRR	GRS		
MORRILL	Bc	Bankard fine sand, channeled	1001	Bankard fine sand, channeled, frequently flooded	13,871.2	4D	4A	4G	693
MORRILL	Ba	Bankard loamy coarse sand, 0 to 2 percent slopes	1002	Bankard loamy coarse sand, occasionally flooded	1,417.6	4D1	4A1	4G1	2100
MORRILL		This map unit was added to the soil survey from an adjacent county for joining purposes.	1006	Bankard loamy fine sand, channeled, frequently flooded	1,549.2	4D	4A	4G	700
MORRILL		This map unit was added to the soil survey from an adjacent county for joining purposes.	1030	Glenberg fine sandy loam, 0 to 2 percent slopes	43.8	4D	2A	2G	2079
MORRILL							2A	2G	2079
MORRILL							3A	3G	2100
MORRILL							3A	3G	2079
...						

- Contrast NRCS Productivity Rating vs LCG
 - Looking for correlation
 - Linear best fit line – Goodness of fit (R^2)
 - Perfect correlation – $R^2 = 1$
 - Good correlation – $R^2 > 0.5$

Morrill County Soils LCG Assignments

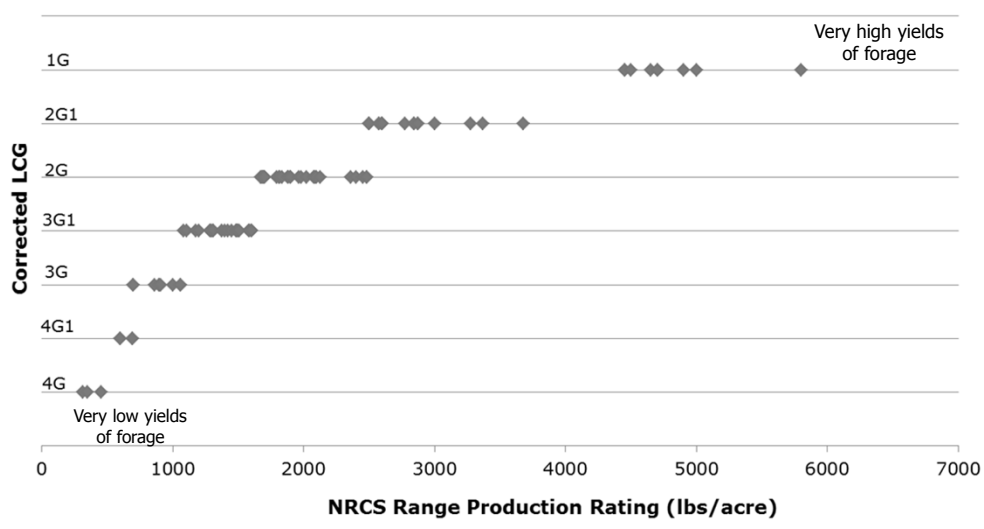
Dept of Revenue LCGs vs. NRCS Range Production Ratings



LCG Definition

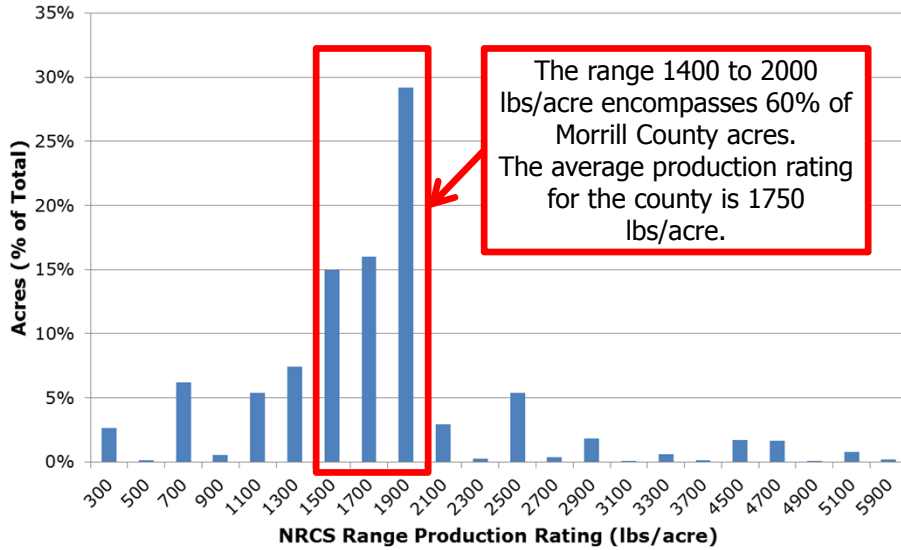
Appropriate LCG Assignments

(As Prescribed by Neb. Admin Code – Chapter 14)



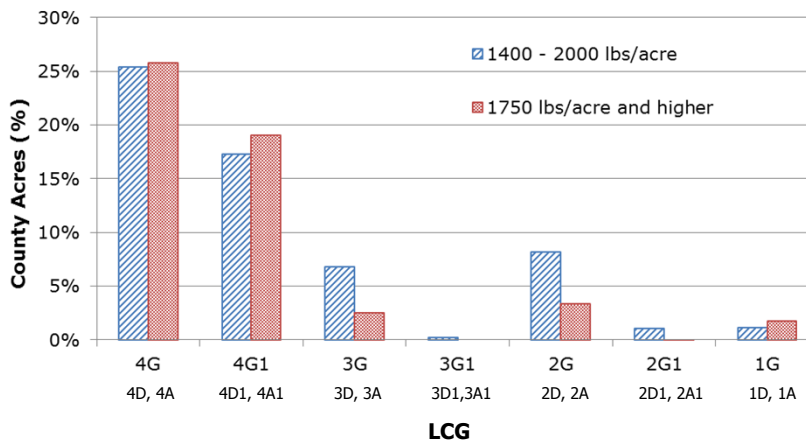
LCG Definition

Morrill County Soils Acre Breakdown of Range Production Ratings



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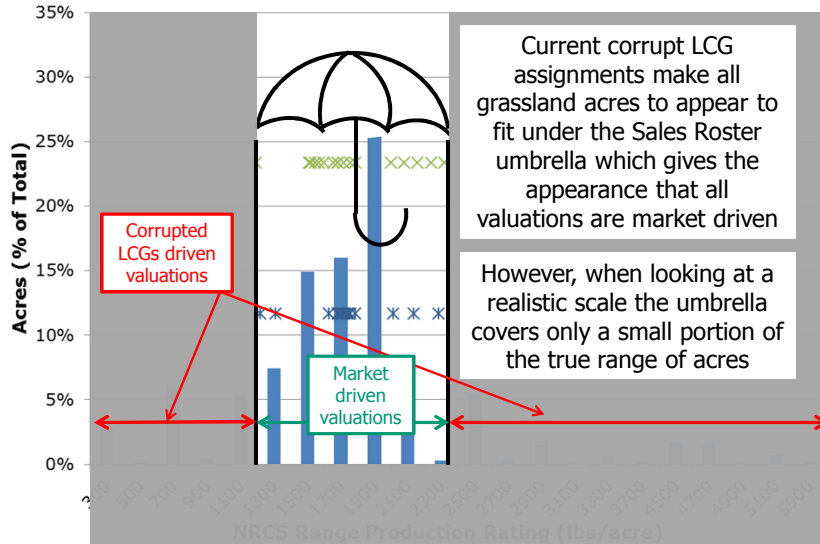
Morrill County Soils LCG Ratings for Designated Range Ratings



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Sales Roster Umbrella

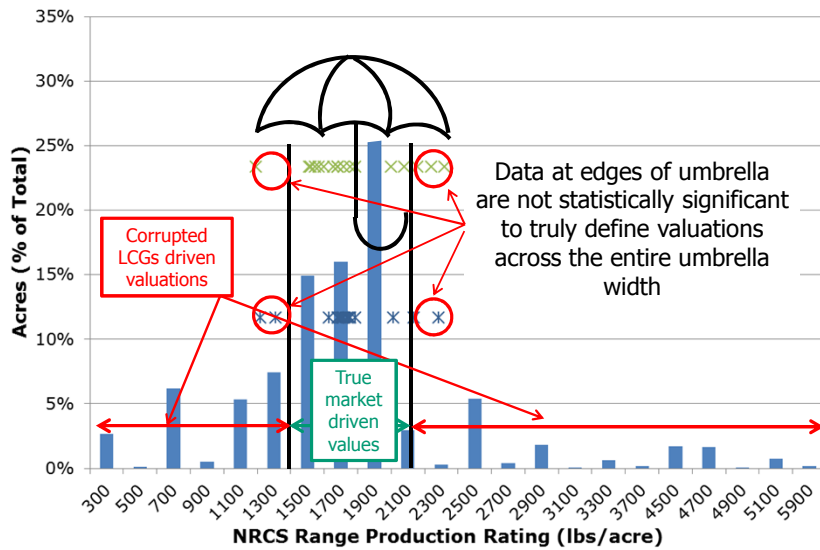
Valuations Driven by the Market and Not Driven by the Market



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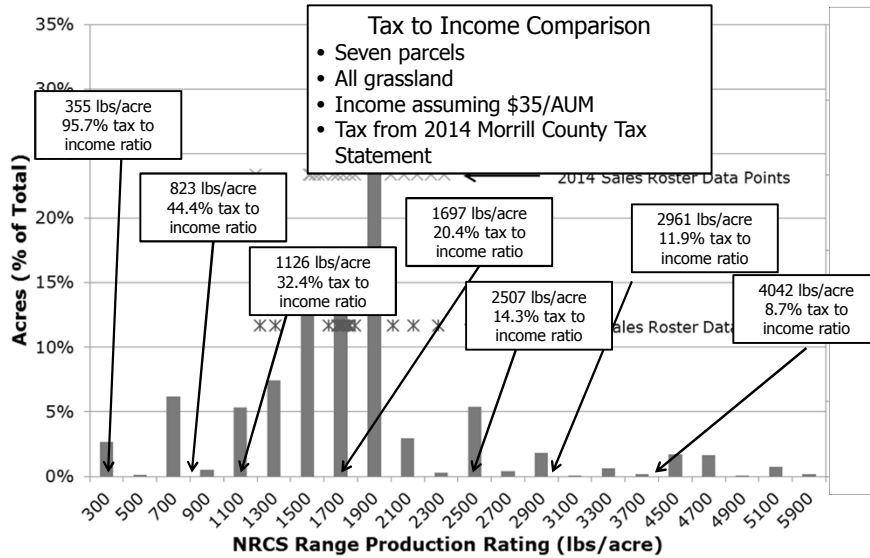
Frayed Umbrella Edges

Valuations Driven by the Market and Not Driven by the Market



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Morrill County Range Production Distribution w/ 2 Years Sales Roster Overlay



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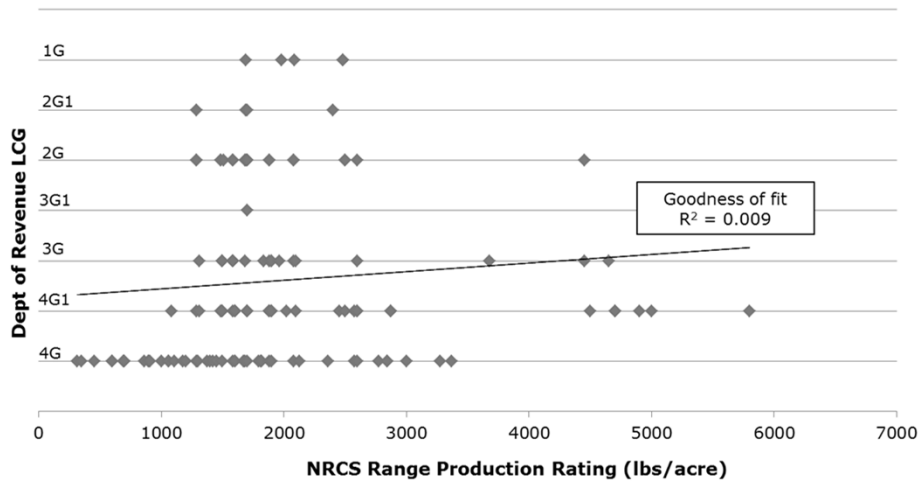
Systemic Issue

- Broader Than Morrill County
- Eight County Study
 - Linear trend line, goodness of fit
 - Line of perfect fit $R^2=1$
 - Statistics from other counties

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Morrill County Soils

LCG vs. Range Production Ratings Linear Trend Line with Goodness of Fit



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Eight County Study

Linear Trend Line Goodness of Fit LCG vs. NRCS Range Production Ratings

County	R^2 - Goodness of fit, Linear trend line of NRCS Range Production Rating vs LVGs
Morrill	0.009
Sioux	0.039
Scotts Bluff	0.034
Box Butte	0.0003 (negative slope trend line)
Sheridan	0.00006
Garden	0.006 (negative slope trend line)
Keya Paha	0.055
Richardson	0.056

* $R^2 = 1$ for perfect fit

- **Conclusions**
 - No correlation of LCGs to meaningful data
 - Systemic issue across 8 counties and is likely state wide

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Eight County Study

Top 1/2 Acres in NRCS Production Rating
Percent assigned to the two lowest LCG classes

County	Percent of Top 1/2 Acres Assigned 4G/4G1
Morrill	85.3
Sioux	66.6
Scotts Bluff	45.6
Box Butte	47.8
Sheridan	62.2
Garden	82.3
Keya Paha	53.9
Richardson	19.5

These should all be 0.0 as none of the best acres should be assigned 4G/4G1 in any county.

The best acres should all be assigned 1G1 – 2G.

- **Conclusions**

- Large percentage of the best soils have been rated in the lowest 2 LCG classifications
 - Exception: Richardson County, however, 58% of best soils have been rated in lowest 4 LCG classifications, instead of highest 4 LCG classes
- **Severe skewing of LCGs to the low end masks the true low end as being no different than the high end**

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Arbitrary LCG Assignments Creates 3 Unique Problems

- **Problem #1 – Distorted Comparable Sales**

- Low end soils made to look the same as higher quality
- “Borrowed Sales” from adjacent counties likely not truly comparable

- **Problem #2 – Arbitrary Valuations due to Arbitrary LCG Assignments -**

- **Problem #3 – Severely misleading the public**

- Low end soils made to look the same as higher quality
 - Real Property Breakdown LCGs are incorrect
 - Real Property Breakdown LCGs are severely misleading

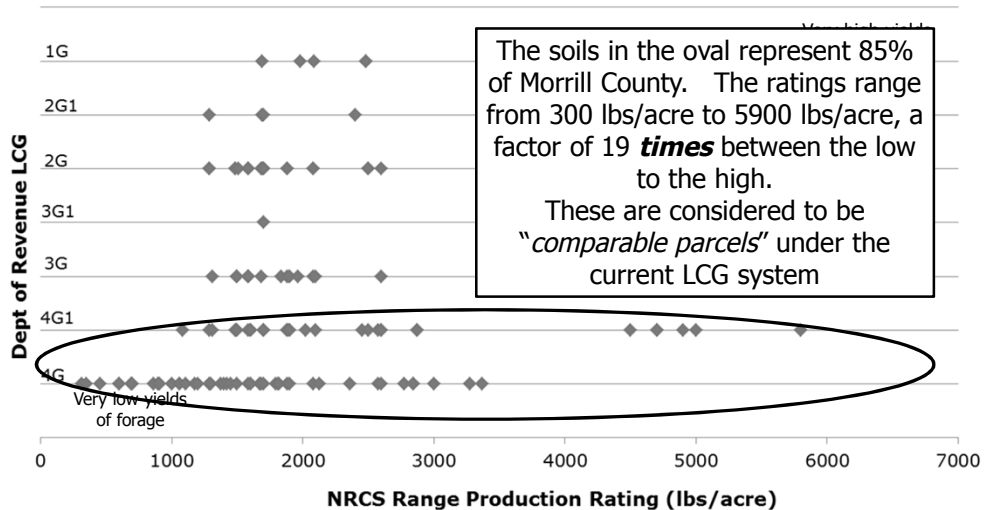
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Arbitrary LCG Assignments ~~First Unique Problem~~

- **Problem #1 – Distorted Comparable Sales**
 - Low end soils made to look the same as higher quality
 - “Borrowed Sales” from adjacent counties likely not truly comparable
- **Problem #2 – Arbitrary Valuations due to Arbitrary LCG Assignments -**
- **Problem #3 – Severely misleading the public**
 - Low end soils made to look the same as higher quality
 - Real Property Breakdown LCGs are incorrect
 - Real Property Breakdown LCGs are severely misleading

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Morrill County Soils LCG Assignments Dept of Revenue LCGs vs. NRCS Range Production Ratings



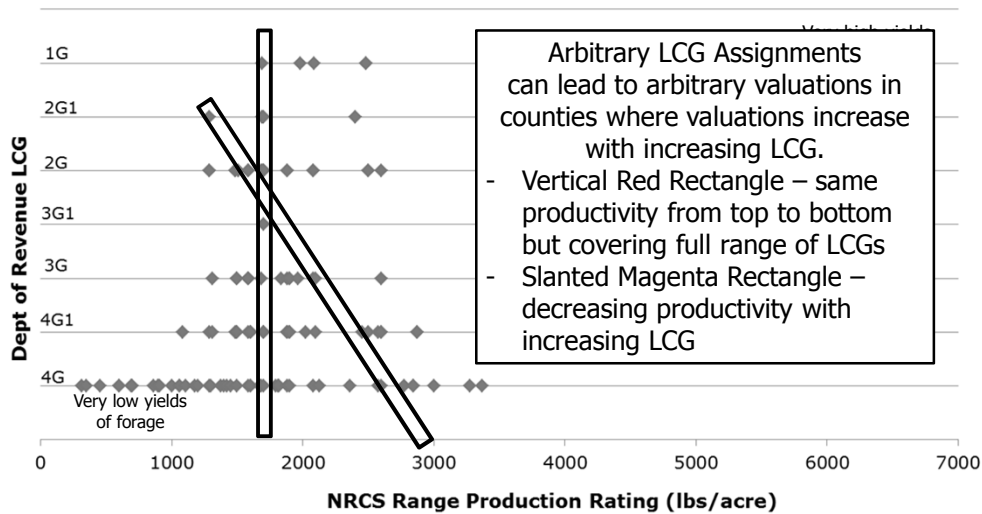
26

Arbitrary LCG Assignments Second Unique Problem

- Problem #1 – Distorted Comparable Sales
 - Low end soils made to look the same as higher quality
 - “Borrowed Sales” from adjacent counties likely not truly comparable
- Problem #2 – Arbitrary Valuations due to Arbitrary LCG Assignments -
- Problem #3 – Severely misleading the public
 - Low end soils made to look the same as higher quality
 - Real Property Breakdown LCGs are incorrect
 - Real Property Breakdown LCGs are severely misleading

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Morrill County Soils LCG Assignments Dept of Revenue LCGs vs. NRCS Range Production Ratings



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Sheridan County Example 2014 Tax Year

- Two Parcels
 - Parcel A – 200 acres mostly 3G (87%) w/ reminder at 4G
 - Parcel B – 320 acres all at 4G1 (100%)
- Sheridan County LCG Rate Structure for 2014
 - 4G - \$300
 - 4G1 - \$335
 - 3G - \$410
- Comparison – Productivity vs Tax

Parcel	Forage capacity (AUM/acre)	Tax Rate (\$/acre)	
A	0.5	\$5.26	<---- 20% higher tax rate
B	1.4	\$4.37	<---- 180% higher productivity

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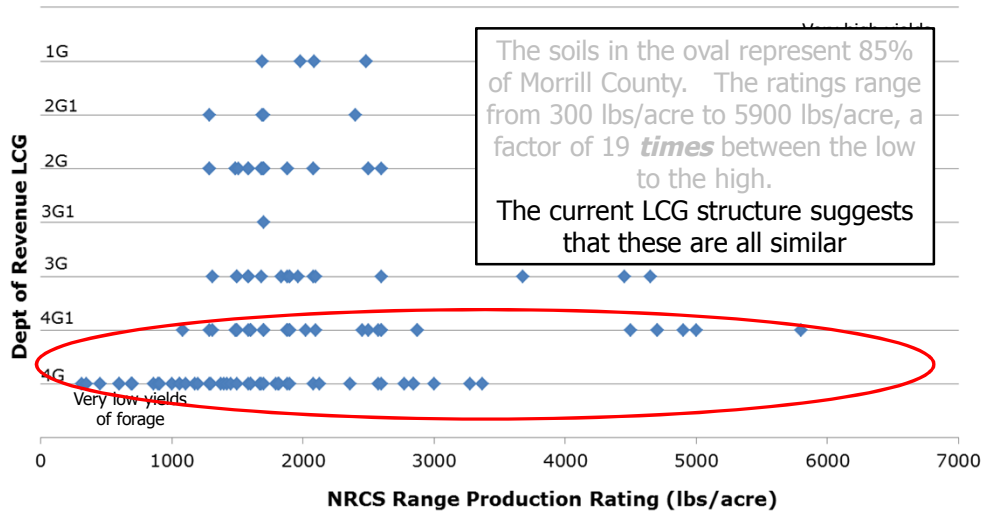
Arbitrary LCG Assignments Third Unique Problem

- Problem #1 – Distorted Comparable Sales
 - Low end soils made to look the same as higher quality
 - “Borrowed Sales” from adjacent counties likely not truly comparable
- Problem #2 – Arbitrary Valuations due to Arbitrary LCG Assignments -
- Problem #3 – Severely misleading the public
 - Low end soils made to look the same as higher quality
 - LCGs are incorrect
 - LCGs are severely misleading

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Morrill County Soils LCG Assignments

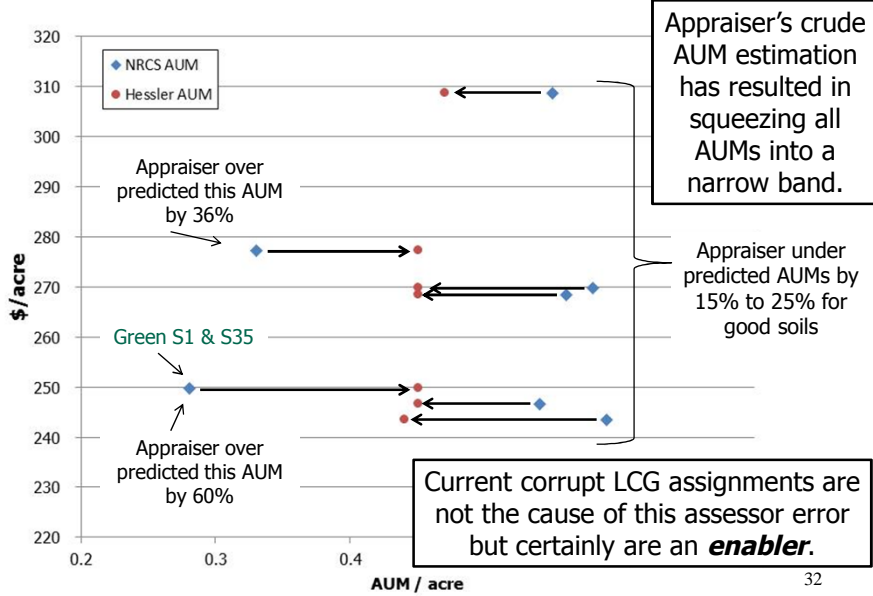
Dept of Revenue LCGs vs. NRCS Range Production Ratings



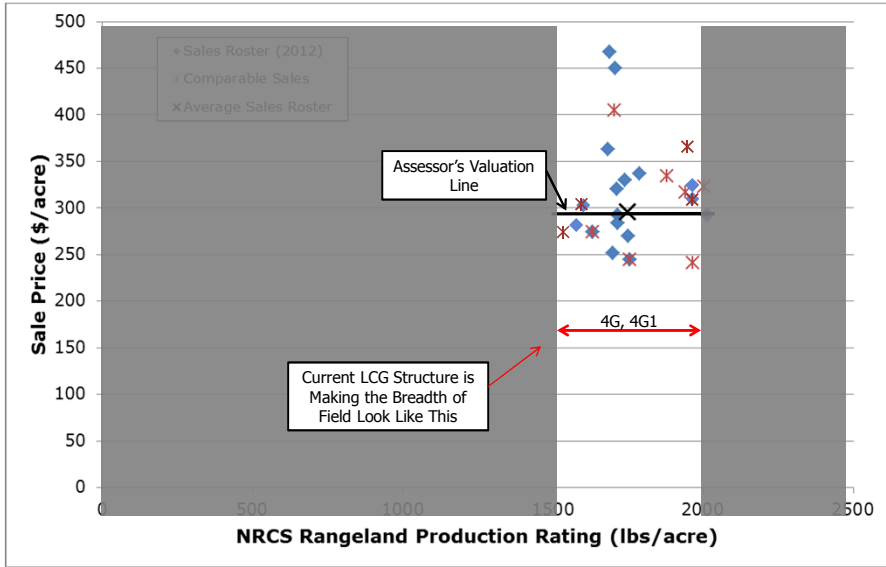
LCG Definition

AUM Comparison

NRCS Soil Survey vs. Appraiser

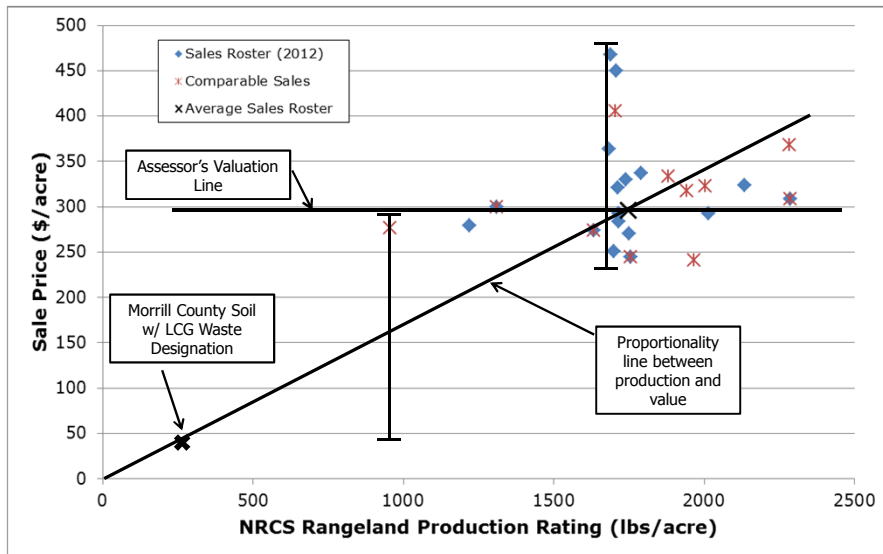


Assessor's Office Sales Comparison of Sales Price to Production



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Assessor's Office Sales Comparison of Sales Price to Production



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LCG Assignment Resolution

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Correcting Valuation Issue Low / Varying Quality Grasslands

- PAD Immediate Corrective Action Needed
 - Redefine soil type LCG assignments
 - Abolish current “**random assignments**”
 - Base on NRCS Rangeland Productivity Ratings
 - Determine valuations on corrected LCGs
- Revise Regulations to Enforce Taxes Shall Be Levied “Proportionately”
 - Grassland – Utilize NRCS Rangeland Productivity Ratings
 - Continuum (instead of 8 classes)
 - Straightforward approach
 - Ensures taxes are levied “**proportionately**”
 - Dryland & Irrigation – NRCS Productivity Index
 - Similar approach to grassland
 - Ensures taxes are levied “**proportionately**”

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Revised LCG Column Applying to Sales

- Utilize NRCS Rangeland Productivity Rating
 - Individual soil symbols / number
 - Soil symbol (currently on Real Property Breakdown)
 - Number of acres (currently on RPB)
 - Individual NRCS soil productivity (add from lookup table)
- Calculate \$ per production
- Apply \$/production back to soil productivity rating to get to \$/acre

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Combining Dept of Revenue Data and NRCS Data

Original Real Property Breakdown
Soil Table

Added NRCS
Productivity Rating

Sym	LVG	Acres	Value / Acre	Total Value	Production capability (lbs/acre)	Total Production (lbs)
5144	4G	17	220	3,740	1285	21,845
5851	4G	11		2,420	1060	11,660
5910	3G	9		4,840	1683	37,026
6025	4G			4,920	700	270,200
6033	4G			4,220	1060	213,060
Road		3		0		
		640		140,140		553,791
Average Prod. =				865 (lbs/acre) =	0.29 (AUM/acre)	

NRCS Productivity Rating based on soil designation

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Summary

- **Significant Problem with Arbitrary LCG Soil Assignments**
 1. Sales deemed comparable are not comparable
 2. Arbitrary taxation based on arbitrary valuations
 - Worst case scenario in Morrill County
 - 96% tax rate
 3. Severely misleading information to the public
- **Steps to Resolve LCG Assignments**
 1. PAD immediately redefine LCG assignments
 2. Adopt regulation changes to tie valuations to production capability