GRAZING MANAGEMENT

Making Ecological Site Descriptions Useful

Stan Boltz
State Range Management Specialist
Huron, South Dakota


USDA
NRCS

Value of Ecological Site Descriptions

- ***Decision Support*** – Provide a means to make management decisions based on predicted outcomes.
- ***Performance Measures*** – With the use of similarity index, rangeland trend, and Rangeland Health, provides a means to measure success of management actions.
- ***Risk Assessment*** – Can evaluate the level of risk associated with various thresholds, transitions, and pathways and the actions associated with each.

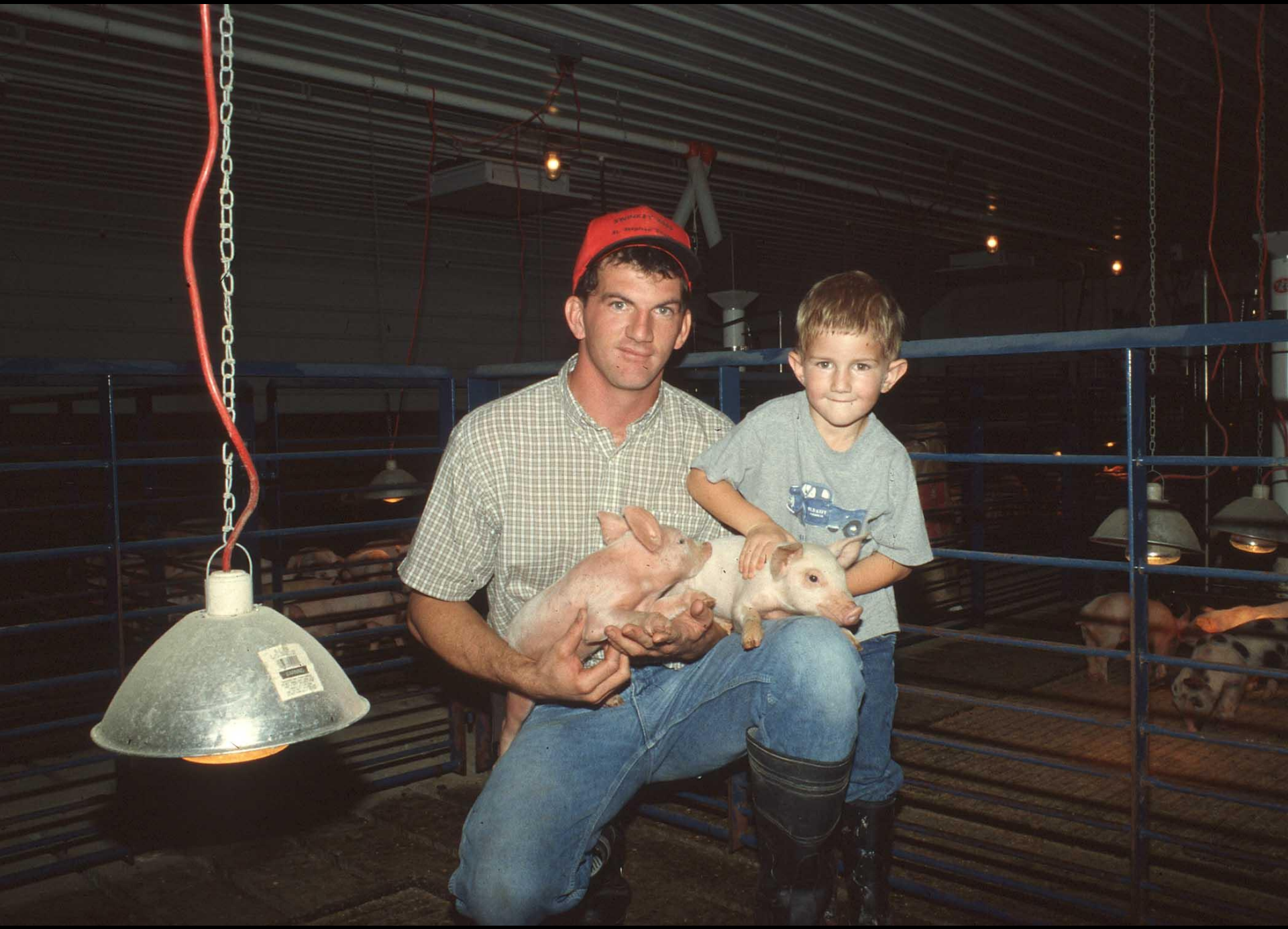
Making ESDs Useful

- Know your audience

Know Your Audience

- Rancher
  - Background
  - Education
  - Communication


CHEVY TRUCKS




HOT SPRINGS
BASKETBALL


HONDA

Know Your Audience

- Rancher
  - Background
  - Education
  - Communication
- Technical Assistance Provider
  - Background
  - Education
  - Communication

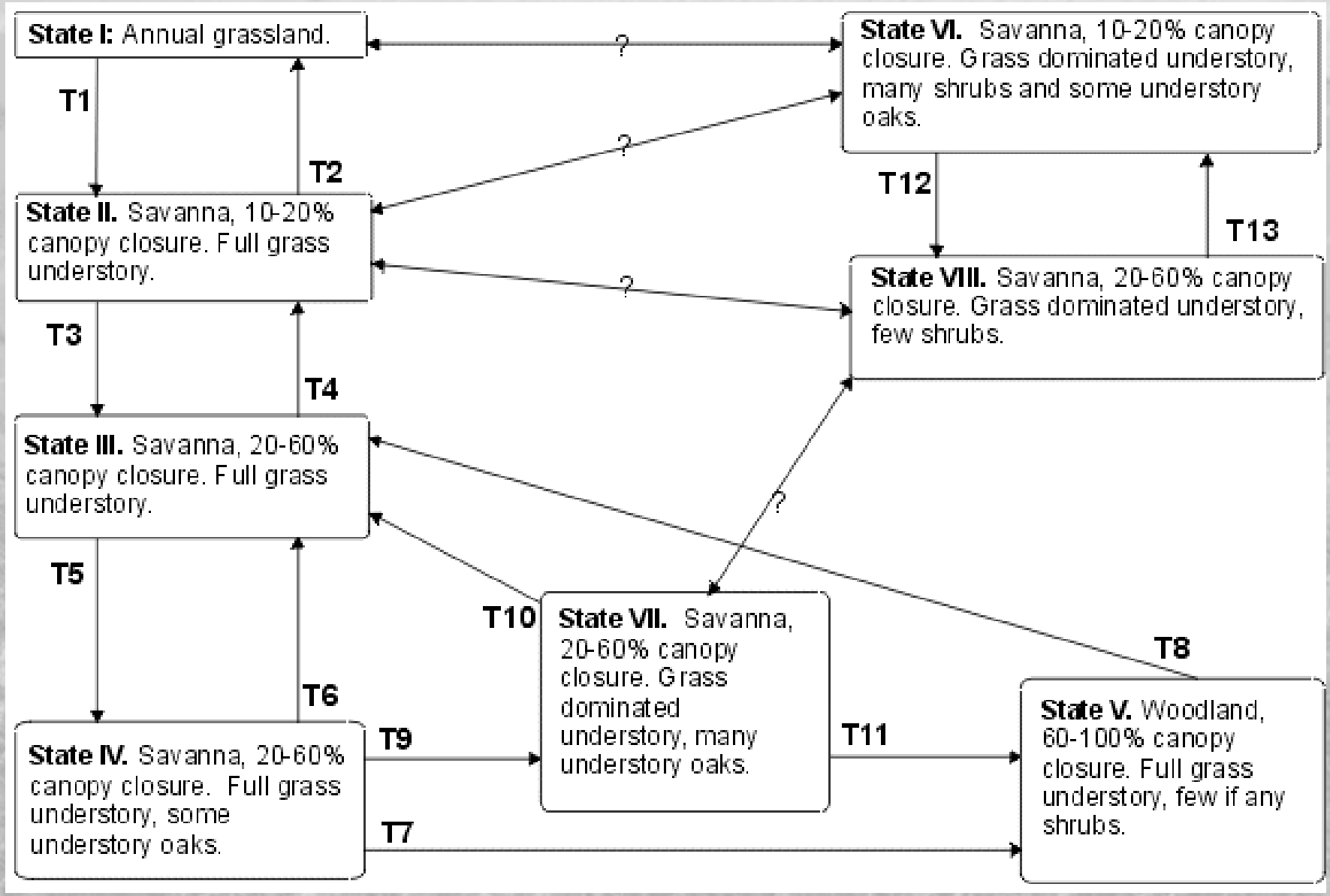

NRCS
TYPICAL BRIDGE SECTION


LASERPLANE
NRCS
NRCS

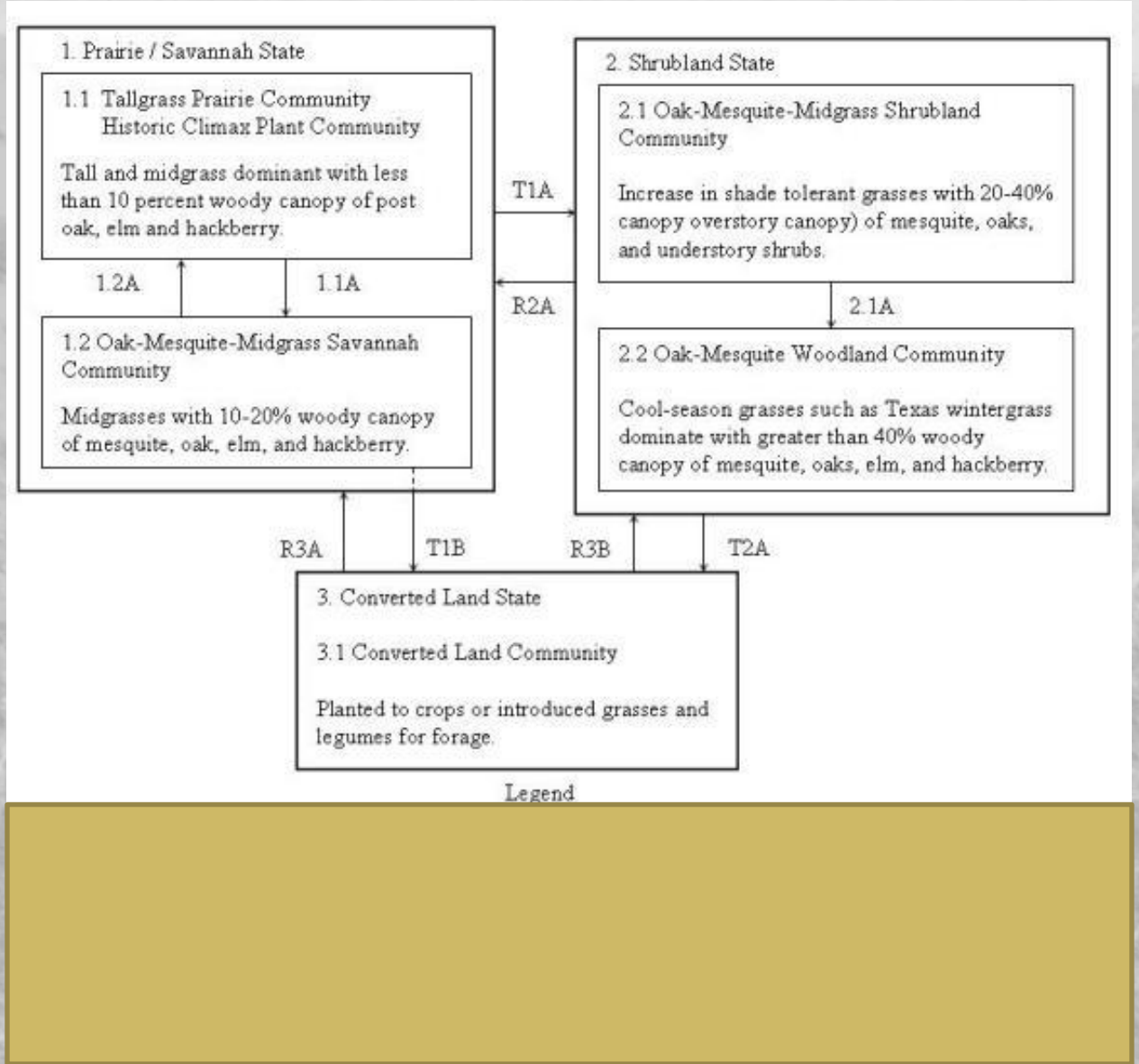
Making ESDs Useful

- Know your audience
- Develop a good product – Format

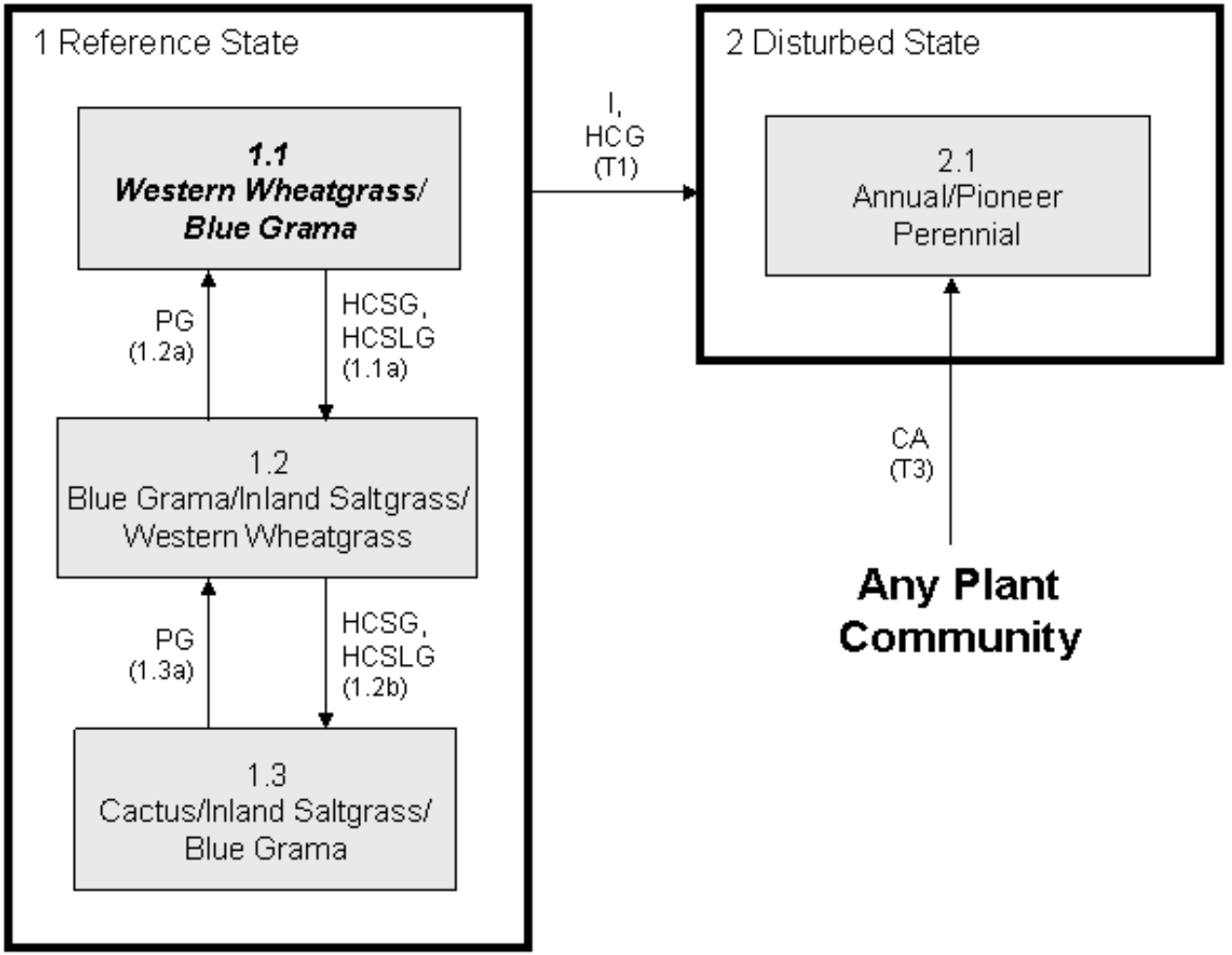
Develop a Good Product – Format



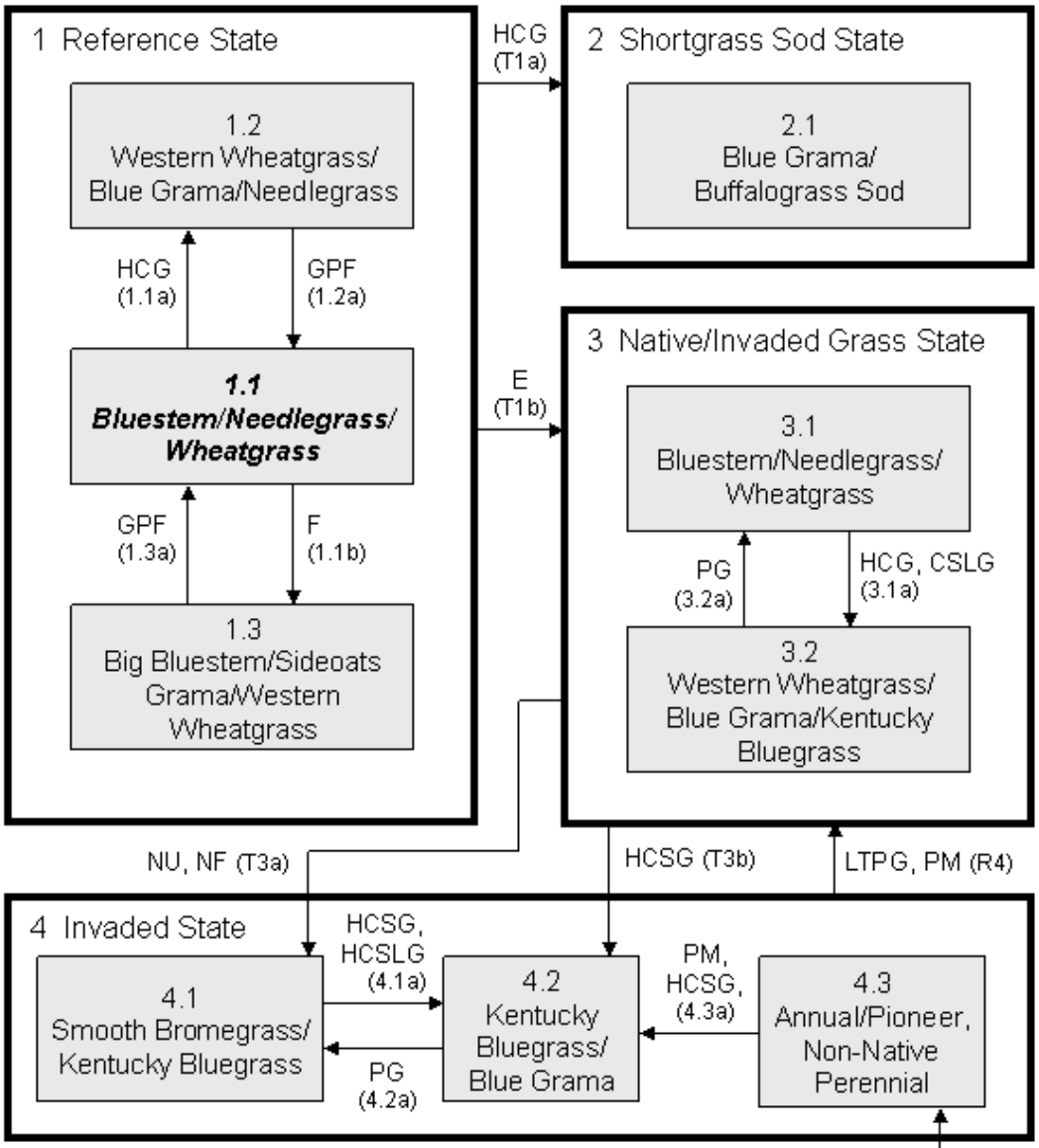
Develop a Good Product – Format



Develop a Good Product – Format



Refer to narrative for details on pathways: **CA** – Cropping followed by abandonment; **HCSG** – Heavy continuous seasonal grazing; **HCSLG** – Heavy continuous season-long grazing; **I** – Inundation for prolonged periods; **PG** – Prescribed grazing.



Refer to narrative for details on pathways: **C** – Cropped, abandoned; **CSLG** – Continuous season-long grazing; **E** – Encroachment of introduced species; **F** – Fire; **GPF** – Grazing, precipitation, and/or fire returning to more normal disturbance regime levels and frequencies; **HCG** – Heavy continuous grazing; **HCSG** – Heavy continuous seasonal grazing; **HCSLG** – Heavy continuous season-long grazing; **LTPG** – Long-term prescribed grazing; **NU, NF** – Non-use, no fire; **PG** – Prescribed grazing; **PM** – Pest management (herbicide); **S** – Seeding.

Making ESDs Useful

- Know your audience
- Develop a good product – Format
  - Clean lines, shading
  - Few, meaningful words
  - Labels and succinct legends

Making ESDs Useful

- Know your audience
- Develop a good product – Format
- Develop a good product - Content

What do you picture?

- Plant community phase: Blue Grama/Western Wheatgrass:
  - Amanda thinks: 30-50% blue grama, and 0-10% western wheatgrass
  - Stan thinks: 20-35% blue grama, and 15-25% western wheatgrass

What helps determine phase?

Blue Grama/Western Wheatgrass Plant Community
This plant community is the result of long-term, heavy, continuous grazing and/or annual, early spring seasonal grazing. Repeated spring grazing depletes stored carbohydrates, resulting in weakening and eventual death of the cool season mid-grasses. Blue grama and western wheatgrass are the dominant species. Other grasses and grass-likes include sedges, needleandthread, prairie junegrass and annual grasses. Forbs such as western ragweed, scurfpea, cudweed sagewort and scarlet globemallow may also be present. This plant community can occur throughout the pasture, on spot grazed areas, and around water sources where season-long grazing patterns occur.

Plant Community Composition and Group Annual Production

		1.1 Bluestem/Needlegrass/ Wheatgrass			3.2 Western Wheatgrass/Blue Grama/Kentucky Bluegrass			4.1 Smooth Bromegrass/ Kentucky Bluegrass			4.2 Kentucky Bluegrass/ Blue Grama		
COMMON/GROUP NAME	SYMBOL	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp	Grp	lbs./acre	% Comp
GRASSES & GRASS-LIKES			*2560 - 2880*	*80 - 90*		*2125 - 2375*	*85 - 95*		*2400 - 2720*	*75 - 85*		*1500 - 1800*	*75 - 90*
TALL WARM-SEASON GRASSES		**1**	**480 - 960**	**15 - 30**	**1**	**50 - 250**	**2 - 10**	**1**	**0 - 64**	**0 - 2**	**1**		
big bluestem	ANGE	1	320 - 800	10 - 25	1	50 - 250	2 - 10	1	0 - 64	0 - 2			
Indiangrass	SONU2	1	64 - 320	2 - 10	1	0 - 75	0 - 3						
switchgrass	PAVI2	1	64 - 320	2 - 10	1	0 - 75	0 - 3						
tall dropseed	SPCOC2	1	0 - 160	0 - 5	1	0 - 75	0 - 3	1	0 - 64	0 - 2			
NEEDLEGRASS		**2**	**480 - 960**	**15 - 30**	**2**	**50 - 250**	**2 - 10**	**2**	**0 - 320**	**0 - 10**	**2**	**0 - 100**	**0 - 5**
green needlegrass	NAVI4	2	160 - 800	5 - 25	2	50 - 250	2 - 10	2	0 - 320	0 - 10	2	0 - 100	0 - 5
porcupine grass	HESP11	2	160 - 800	5 - 25	2	0 - 125	0 - 5						
needleandthread	HECOC8	2	64 - 320	2 - 10	2	0 - 125	0 - 5						
WHEATGRASS		**3**	**320 - 640**	**10 - 20**	**3**	**250 - 750**	**10 - 30**	**3**	**0 - 320**	**0 - 10**	**3**	**0 - 100**	**0 - 5**
western wheatgrass	PASM	3	320 - 640	10 - 20	3	250 - 750	10 - 30	3	0 - 320	0 - 10	3	0 - 100	0 - 5
slender wheatgrass	ELTR7	3	64 - 320	2 - 10	3	0 - 125	0 - 5						
MID WARM-SEASON GRASSES		**4**	**160 - 480**	**5 - 15**	**4**	**0 - 125**	**0 - 5**	**4**			**4**		
little bluestem	SCSC	4	160 - 480	5 - 15	4	0 - 125	0 - 5						
sideoats grama	BOCU	4	64 - 320	2 - 10	4	0 - 125	0 - 5						
prairie dropseed	SPHE	4	32 - 160	1 - 5	4	0 - 25	0 - 1						
SHORT WARM-SEASON GRASSES		**5**	**32 - 160**	**1 - 5**	**5**	**250 - 500**	**10 - 20**	**5**	**0 - 96**	**0 - 3**	**5**	**200 - 700**	**10 - 35**
blue grama	BOGR2	5	32 - 160	1 - 5	5	250 - 500	10 - 20	5	0 - 96	0 - 3	5	200 - 700	10 - 35
buffalograss	BODA2	5	0 - 96	0 - 3	5	0 - 125	0 - 5				5	0 - 100	0 - 5
OTHER NATIVE GRASSES		**6**	**32 - 160**	**1 - 5**	**6**	**25 - 125**	**1 - 5**	**6**	**32 - 160**	**1 - 5**	**6**	**20 - 100**	**1 - 5**
prairie junegrass	KOMA	6	32 - 96	1 - 3	6	25 - 75	1 - 3	6	32 - 64	1 - 2	6	0 - 20	0 - 1
Scribner panicum	DIOLS	6	0 - 32	0 - 1	6	0 - 50	0 - 2	6	0 - 32	0 - 1	6	0 - 40	0 - 2
other grasses	2GRAM	6	0 - 160	0 - 5	6	0 - 125	0 - 5	6	0 - 160	0 - 5	6	0 - 100	0 - 5
GRASS-LIKES		**7**	**32 - 160**	**1 - 5**	**7**	**50 - 250**	**2 - 10**	**7**	**32 - 160**	**1 - 5**	**7**	**40 - 200**	**2 - 10**
sedge	CAREX	7	32 - 160	1 - 5	7	50 - 250	2 - 10	7	32 - 160	1 - 5	7	40 - 200	2 - 10
other grass-likes	2GL	7	0 - 96	0 - 3	7	0 - 75	0 - 3	7	0 - 96	0 - 3	7	0 - 60	0 - 3
NON-NATIVE GRASSES		**8**			**8**	**250 - 625**	**10 - 25**	**8**	**960 - 2080**	**30 - 65**	**8**	**500 - 1000**	**25 - 50**
annual bromegrass	BROMU	8			8	0 - 125	0 - 5	8	0 - 160	0 - 5	8	20 - 160	1 - 8
Kentucky bluegrass	POPR	8			8	125 - 500	5 - 20	8	320 - 800	10 - 25	8	400 - 900	20 - 45
quackgrass	ELRE4	8			8	0 - 250	0 - 10	8	0 - 480	0 - 15	8	40 - 300	2 - 15
smooth bromegrass	BRIN2	8			8	0 - 250	0 - 10	8	640 - 1920	20 - 60	8	0 - 200	0 - 10
FORBS		*9*	*160 - 320*	*5 - 10*	*9*	*125 - 250*	*5 - 10*	*9*	*160 - 480*	*5 - 15*	*9*	*200 - 400*	*10 - 20*
absinth sagewort	ARAB3				9	0 - 75	0 - 3	9	0 - 96	0 - 3	9	20 - 160	1 - 8

smooth bromegrass	BRIN2	8			8	0 - 250	0 - 10	8	640 - 1920	20 - 60	8	0 - 200	0 - 10
FORBS		*9*	*160 - 320*	*5 - 10*	*9*	*125 - 250*	*5 - 10*	*9*	*160 - 480*	*5 - 15*	*9*	*200 - 400*	*10 - 20*
absinth sagewort	ARAB3				9	0 - 75	0 - 3	9	0 - 96	0 - 3	9	20 - 160	1 - 8
American vetch	VIAM	9	0 - 32	0 - 1									
catclaw sensitive briar	MINU6	9	32 - 64	1 - 2									
cudweed sagewort	ARLU	9	32 - 64	1 - 2	9	25 - 75	1 - 3	9	32 - 128	1 - 4	9	20 - 100	1 - 5
dotted gayfeather	LIPU	9	32 - 64	1 - 2	9	0 - 25	0 - 1						
false boneset	BREU	9	0 - 64	0 - 2									
goldenrod	SOLID	9	32 - 64	1 - 2	9	25 - 75	1 - 3	9	32 - 160	1 - 5	9	20 - 100	1 - 5
groundplum milkvetch	ASCR2	9	0 - 32	0 - 1									
heath aster	SYER	9	32 - 64	1 - 2	9	25 - 75	1 - 3	9	32 - 128	1 - 4	9	20 - 60	1 - 3
Illinois bundleflower	DEIL	9	0 - 64	0 - 2									
Maximilian sunflower	HEMA2	9	32 - 64	1 - 2									
penstemon	PENST	9	32 - 64	1 - 2	9	0 - 25	0 - 1						
prairie coneflower	RACO3	9	32 - 64	1 - 2	9	0 - 25	0 - 1	9	0 - 32	0 - 1			
prickly lettuce	LASE				9	0 - 50	0 - 2	9	0 - 96	0 - 3	9	20 - 80	1 - 4
purple coneflower	ECAN2	9	0 - 64	0 - 2									
purple prairie clover	DAPU5	9	32 - 64	1 - 2	9	0 - 25	0 - 1						
rush skeletonweed	LYJU	9	0 - 32	0 - 1	9	0 - 25	0 - 1	9	0 - 32	0 - 1	9	0 - 20	0 - 1
scarlet gaura	GACO5	9	32 - 64	1 - 2	9	0 - 25	0 - 1						
scurfpea	PSORA2	9	32 - 64	1 - 2	9	25 - 50	1 - 2	9	32 - 64	1 - 2	9	20 - 60	1 - 3
stiff sunflower	HEPA19	9	32 - 64	1 - 2									
sweetclover	MELIL				9	0 - 100	0 - 4	9	32 - 256	1 - 8	9	20 - 240	1 - 12
western ragweed	AMPS	9	0 - 32	0 - 1	9	25 - 50	1 - 2	9	32 - 128	1 - 4	9	20 - 100	1 - 5
western salsify	TRDU				9	0 - 50	0 - 2	9	0 - 96	0 - 3	9	20 - 60	1 - 3
western yarrow	ACMIO	9	0 - 32	0 - 1	9	25 - 50	1 - 2	9	32 - 64	1 - 2	9	20 - 60	1 - 3
woolly verbena	VEST	9	0 - 32	0 - 1	9	0 - 50	0 - 2	9	0 - 96	0 - 3	9	0 - 60	0 - 3
native forbs	2FN	9	32 - 128	1 - 4	9	25 - 75	1 - 3	9	0 - 64	0 - 2	9	0 - 40	0 - 2
introduced forbs	2FI				9	0 - 125	0 - 5	9	32 - 160	1 - 5	9	20 - 200	1 - 10
SHRUBS		*10*	*160 - 320*	*5 - 10*	*10*	*25 - 125*	*1 - 5*	*10*	*64 - 320*	*2 - 10*	*10*	*0 - 100*	*0 - 5*
leadplant	AMCA6	10	32 - 160	1 - 5	10	0 - 25	0 - 1						
rose	ROSA5	10	32 - 64	1 - 2	10	0 - 50	0 - 2	10	32 - 64	1 - 2	10	0 - 20	0 - 1
snowberry	SYMPH	10	64 - 256	2 - 8	10	25 - 125	1 - 5	10	32 - 320	1 - 10	10	0 - 100	0 - 5
other shrubs	2SHRUB	10	0 - 96	0 - 3	10	0 - 50	0 - 2	10	0 - 64	0 - 2			

Annual Production lbs./acre	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH	LOW RV HIGH
GRASSES & GRASS-LIKES	2110 - 2720 - 3260	1670 - 2238 - 2675	1995 - 2688 - 3260	1225 - 1650 - 2015
FORBS	145 - 240 - 370	110 - 188 - 285	145 - 320 - 570	175 - 300 - 475
SHRUBS	145 - 240 - 370	20 - 75 - 140	60 - 192 - 370	0 - 50 - 110
TOTAL	2400 - 3200 - 4000	1800 - 2500 - 3100	2200 - 3200 - 4200	1400 - 2000 - 2600

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. RV = Representative value. Refer to PLANTS database for scientific names and codes: http://plants.usda.gov

Disadvantages?

- People will misuse the data…
- Without the data, people will second guess anyway.

I'd rather put forward our first guess rather than having people use their second guess!

Stocking rates

- Suggested initial stocking rates – valuable information that can and should be included in the interpretations section.
- Should not be considered to be conflicting with stocking rates included in permits/contracts.
  - Stocking rates within permits/contracts are specific to the terms and conditions of that permit.
- Stocking rates impact management (Briske, et. al., 2008)
- We need to get tools into the hands of technical assistance providers to help them do their job.

Stocking rates

Animal Community – Grazing Interpretations

The following table lists annual, suggested initial stocking rates with average growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of conservation planning. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this a resource inventory is necessary to document plant composition and production. More accurate carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data and actual stocking records, particularly when grazers other than cattle are involved. With consultation of the land manager, more intensive grazing management may result in improved harvest efficiencies and increased carrying capacity.

Plant Community	Average Annual Production (lbs./acre, air-dry)	Stocking Rate* (AUM/acre)
Bluestem/Needlegrass/Wheatgrass (1.1 & 3.1)	3200	0.88
Western Wheatgrass/Blue Grama/Kentucky Bluegrass (3.2)	2500	0.69
Smooth Bromegrass/Kentucky Bluegrass (4.1)	3200	0.88
Kentucky Bluegrass/Blue Grama (4.2)	2000	0.55
Annual/Pioneer, Non-Native Perennial (4.3)	900	0.25

* Based on 912 lbs./acre (air-dry weight) per Animal Unit Month (AUM), and on 25% harvest efficiency (refer to USDA NRCS, National Range and Pasture Handbook).

Making ESDs Useful

- Know your audience
- Develop a good product – Format
- Develop a good product - Content
  - Need plant composition tables for every plant community phase
  - Need stocking rates
  - Include more technical info in narratives

Range "Scienc-ese"

- Consider using more broadly known terms.
- For example:
  - Instead of "saturated hydraulic conductivity" – consider using "infiltration"
  - Instead of "high resilience" – consider saying "this plant community is capable of recovery after removal of disturbance"

Tools for the TA Provider

- Web Soil Survey
- SoilWeb for the iPhone
- Field Office Technical Guide
- Range Tool
  - Ecological site inventory
  - Using ESD to select plant community phase and associated data
  - Develop a growth-curve adjusted planned grazing system

Tools for the rancher

- Some of the same tools as for the technical assistance provider – probably for the younger ranchers
- State and transition diagram, on paper, is probably one of the most useful tools in relation to the ecological site description.
- ESD-Lite

Value of Ecological Site Descriptions

- ***Decision Support*** – Provide a means to make management decisions based on predicted outcomes.
- ***Performance Measures*** – With the use of similarity index, rangeland trend, and Rangeland Health, provides a means to measure success of management actions.
- ***Risk Assessment*** – Can evaluate the level of risk associated with various thresholds, transitions, and pathways and the actions associated with each.
- ***Knowledge Transfer*** – Provides a framework for transferring experience and knowledge.


The End