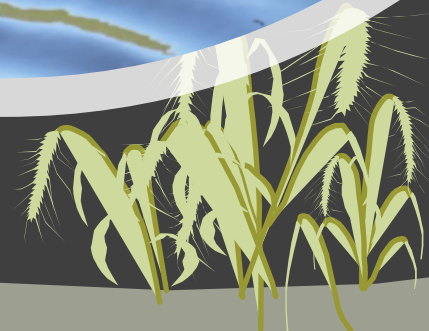


SOILS FEATURES

- Closed upland depression landform
- Frequent ponding
- Low saturated hydraulic conductivity
- Slopes 0-1% slopes
- Formed in loess.
- Surface layer silt loam or silty clay loam, 2-17" thick
- Subsurface is silty clay.
- Fillmore, Scott, or **Massie** Soils



Plant Communities

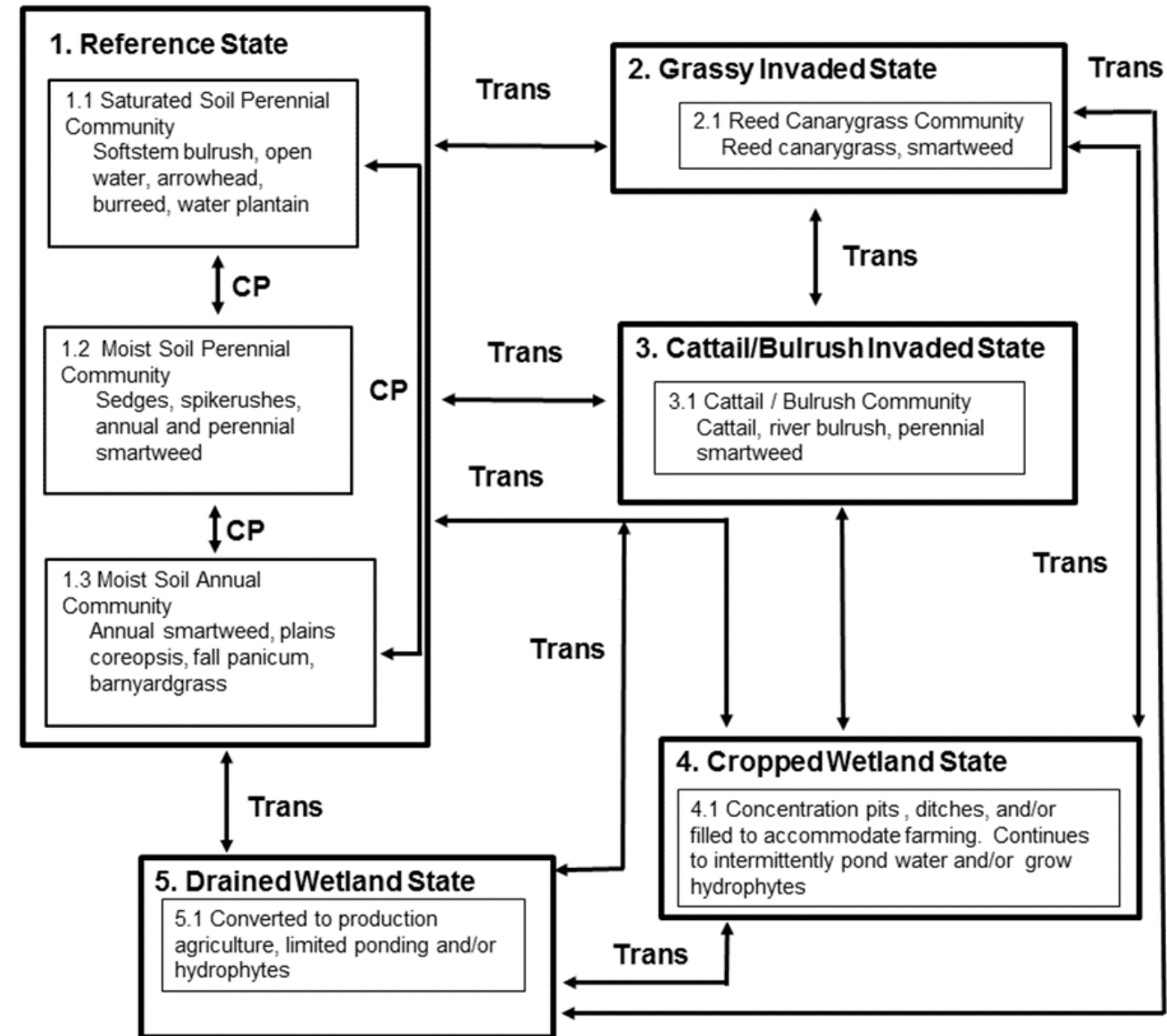
- Type and extent of vegetation controlled by hydroperiods.
- Plant communities fluctuate with hydroperiod.
- Generally speaking, disturbance promotes annual communities, lack of disturbance promotes perennial communities.



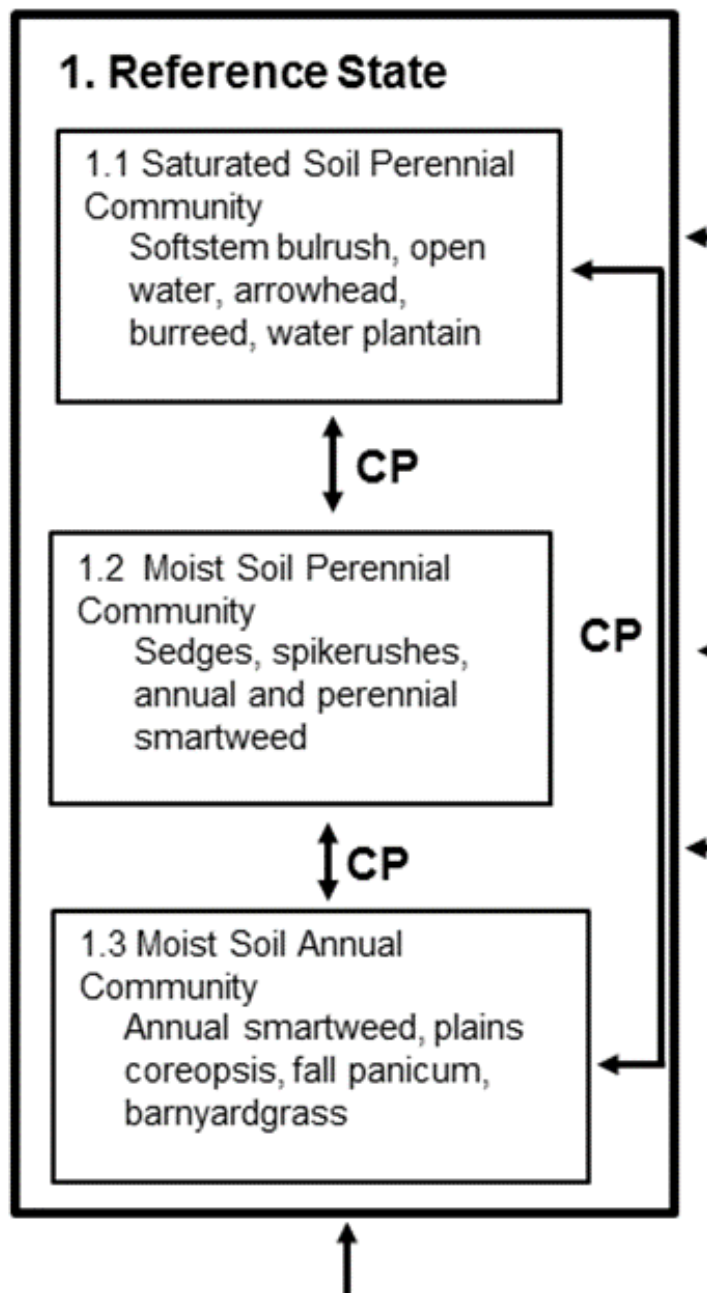
State-and-Transition Diagram

- 5 Steady States
- Community Pathways driven by increase or decrease of ponding frequency or duration
- Transitions vs. Restorations
- Significant difference in ability to transition back to reference in this ecological site as compared to most ecological sites.

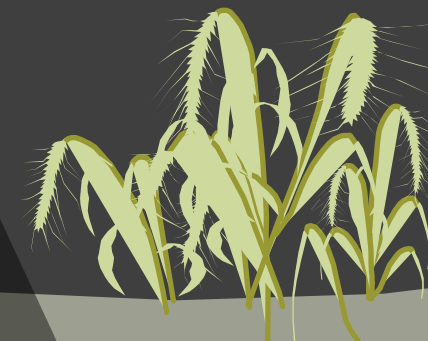
MLRA 75 Closed Upland Depression



State-and-Transition Diagram

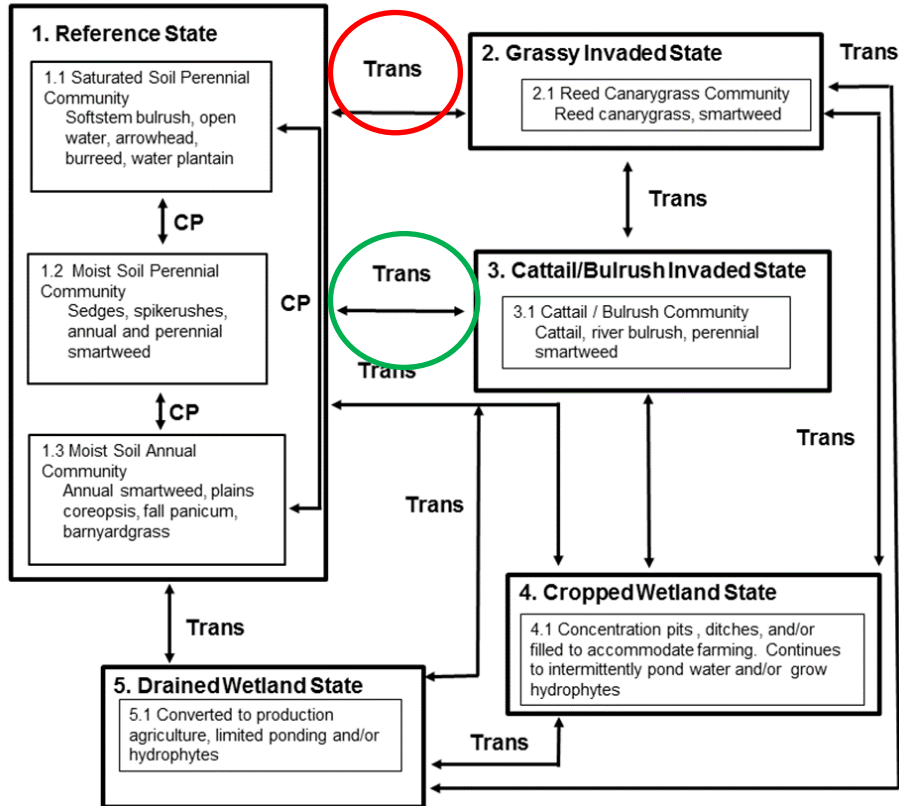


Community Pathway	Driver
1.1 - 1.2	Decrease ponding frequency and duration.
1.1 - 1.3	Decrease ponding frequency and duration coupled with disturbance (e.g., grazing, herbicide application, light disking).
1.2 - 1.1	Increase ponding frequency and duration.
1.2 - 1.3	Increase disturbance regime with grazing, haying, disking, and/or herbicide treatments.
1.3 - 1.1	Increase ponding frequency and duration and reduce disturbance regime.
1.3 - 1.2	Short-term inundation to maintain moist soil conditions and limited disturbance from grazing or other management treatments.



State-and-Transition Diagram

MLRA 75 Closed Upland Depression



Transition	Driver
State 1 (1.1, 1.2, 1.3), 2, 3, 4 - 5	Significant drainage activities (i.e., excavation of concentration pits, construction of surface or tile drainage features, placement of fill material). Rarely ponds water and hydrophytes generally not present. Site is cultivated.
State 1 (1.1, 1.2, 1.3), 2, 3 - 4	Site is cultivated. Almost always has drainage activities, excavated concentration pits, or drained or filled to accommodate farming. Wetland intermittently ponds water and/or grows hydrophytes.
State 5 - 4	Drainage features become less effective, hydrologic restoration by removing culturally accelerated sediment and/or fill material, filling concentration pit, plugging surface drains. Site remains cultivated.
State 1 (1.1, 1.2, 1.3), 2 - 3	Significant ponding depth (>12 inches), increased duration and frequency of ponding, increased nutrient loads from sedimentation, low intensity grazing, or no disturbance.
State 4, 5 - 3	Site no longer cultivated. Hydrologic restoration of the site by removing culturally accelerated sediment and/or fill material, filling concentration pit(s), and plugging surface drain(s). If site is not disturbed and has long-term ponding and deep depth (>12 inches), the Cattail/Bulrush Invaded State can become established.
State 1 (1.1, 1.2, 1.3), 3 - 2	Short-term ponding, shallower ponding depth (<12 inches), saturated soil conditions, and a combination of increased nutrient loads from sedimentation, low intensity or no grazing, annual haying.
State 4, 5 - 2	Site no longer cultivated. Hydrologic restoration of the site. Often involves removing culturally accelerated sediment and/or fill material, filling concentration pit(s), and plugging surface drain(s). If site remains saturated or has limited short-term ponding and shallow depth (<12 inches), and/or seeded to reed canarygrass, the Grassy Invaded state can become established.
State 2 - 1 (1.1, 1.2, 1.3)	Multiple disturbance treatments within and over multiple years (chemical, mechanical, high intensity grazing) and/ or sediment removal.
State 3 - 1 (1.1, 1.2, 1.3)	Multiple disturbance treatments within and over multiple years (chemical, mechanical, high intensity grazing) and/ or sediment removal. Decreased ponding depth, duration, and frequency.
State 4, 5 - 1 (1.1, 1.2, 1.3)	Site no longer cultivated. Hydrologic restoration of the site. Often involves removing culturally accelerated sediment and/or fill material, filling concentration pit(s), and plugging surface drain(s). Moist Soil Annual Community will usually colonize the site post restoration.

Plant Communities – Reference State

1.1 Saturated Soil Perennial Community

Dominant Plants: arrowhead, burreed, native cattail, softstem bulrush, and water plantain.





Plant Communities – Reference State

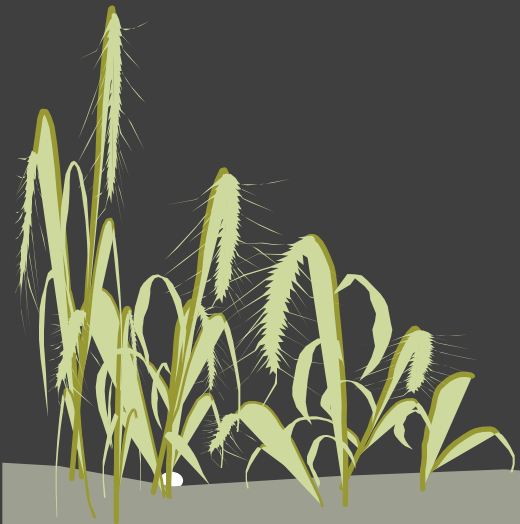
1.2 Moist Soil Perennial Community

Dominant Plants: spikerushes, sedges, rushes, western wheatgrass, foxtail barley, switchgrass, smartweeds

Plant Communities – Reference State

1.2 Moist Soil Annual Community

Dominant Plants: annual smartweeds, barnyardgrass, bidens, cocklebur, fall panicum, pigweeds, plains coreopsis, ragweed, sumpweed



Plant Community Table – Loamy Plains – Reference Plant Community 1.1

Mixed Native Grass Plant Species Composition

Grass/Grasslike					Annual Production (pounds per acre)	
Group	Group name	Common name	Symbol	Scientific name	Low	High
1 -Tall Warm Season Grasses					1400	2300
		big bluestem	ANGE	Andropogon gerardii	900	1360
		switchgrass	PAVI2	Panicum virgatum	180	410
		Indiangrass	SONU2	Sorghastrum nutans	180	590
2 -Mid Warm Season Grasses					750	1080
		sideoats grama	BOCU	Bouteloua curtipendula	180	360
		little bluestem	SCSC	Schizachyrium scoparium	540	900
		composite dropseed	SPCOC2	Sporobolus compositus var. compositus	0	72
3 -Native Cool Season Grasses					50	360
		Scribner's panicum	DIOLS	Dichanthelium oligosanthos var. scribnerianum	0	180
		Canada wildrye	ELCA4	Elymus canadensis	0	72
		needle and thread	HECOC8	Hesperostipa comata subsp. comata	0	72
		porcupinegrass	HESP11	Hesperostipa spartea	0	72
		prairie Junegrass	KOMA	Koeleria macrantha	0	72
		western wheatgrass	PASM	Pascopyrum smithii	36	360
4 -Short Warm Season Grasses					180	450
		blue grama	BOGR2	Bouteloua gracilis	150	360
		buffalograss	BUDA	Buchloe dactyloides	0	180
		plains muhly	MUCU3	Muhlenbergia cuspidata	0	108
5 -Other Native Grasses and Grass-Likes					40	72
		Grass, perennial	2GP		0	72
		sedge	CAREX	Carex	36	72

Plant Community Table – Loamy Plains – Reference Plant Community 1.1

4 -Subdominant Forbs 15%			85	300
woollyleaf bur ragweed	AMGR5	<i>Ambrosia gravi</i>	20	75
Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	5	15
lambsquarters	CHAL7	<i>Chenopodium album</i>	5	15
Texas croton	CRTE4	<i>Croton texensis</i>	0	5
Dakota mock verbena	GLBI2	<i>Glandularia bipinnatifida</i>	0	5
waterclover	MARSI	<i>Marsilea</i>	5	15
evening primrose	OENOT	<i>Oenothera</i>	5	15
wedgeleaf	PHCU3	<i>Phyla cuneifolia</i>	5	15
lanceleaf fogfruit	PHLA3	<i>Phyla lanceolata</i>	5	20
knotweed	POLYG4	<i>Polygonum</i>	10	30
Pennsylvania smartweed	POPE2	<i>Polygonum pensylvanicum</i>	15	50
curly dock	RUCR	<i>Rumex crispus</i>	5	15
Kansas arrowhead	SAAM4	<i>Sagittaria ambigua</i>	5	15
buffalobur nightshade	SORO	<i>Solanum rostratum</i>	0	10
white heath aster	SYER	<i>Symphyotrichum ericoides</i>	0	5



State 2: Grassy Invaded State Reed Canarygrass Dominated Community

- Little or no disturbance
- Saturated conditions with ponding <12" for prolonged periods
- Seeded or invaded
- Annual haying and/or moderate grazing with recovery
- Excessive sedimentation
- Nutrient loads with sediment may be the critical disturbance



State 3: Bulrush/Cattail Invaded State Bulrush & Cattail Dominated Community

- Little or no Disturbance
- Deep ponding for long periods and/or frequent ponding
- High sediment load which provides excessive nitrogen and phosphorus
- Common on Massie and Scott soils, uncommon on Filmore soils (unless irrigation run-off provides a more stable ponding)



State 4: Cropped Wetlands

State 5: Drained Wetlands

- Cropped wetlands have been modified but continue to pond water and grow hydrophytes
- Drained wetlands have been modified to the extent that hydrophytes rarely grow and ponding is rare (except concentration pits).



Using Ecological Site Descriptions

Where Do We Go From Here?

- Plant Community Data
- Additional Production Data
- Continue to test State-and-Transition Model
- Continue to test management methods



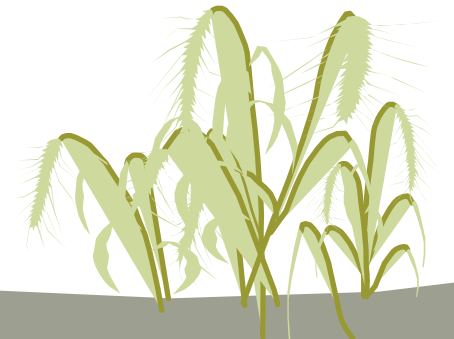
WHERE TO FIND ECOLOGICAL SITE DESCRIPTIONS

Most ecological sites are available through:

EDIT – Ecosystem Dynamics Interpretive Tool

<https://edit.jornada.nmsu.edu/>

However, sites updated between July 1, 2018 and December 1, 2018 are not available on EDIT. This includes MLRA 75 – Closed Upland Depression.



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