



Broad Scale Recharge Update

PRRIP Governance Committee Meeting

July 26, 2016

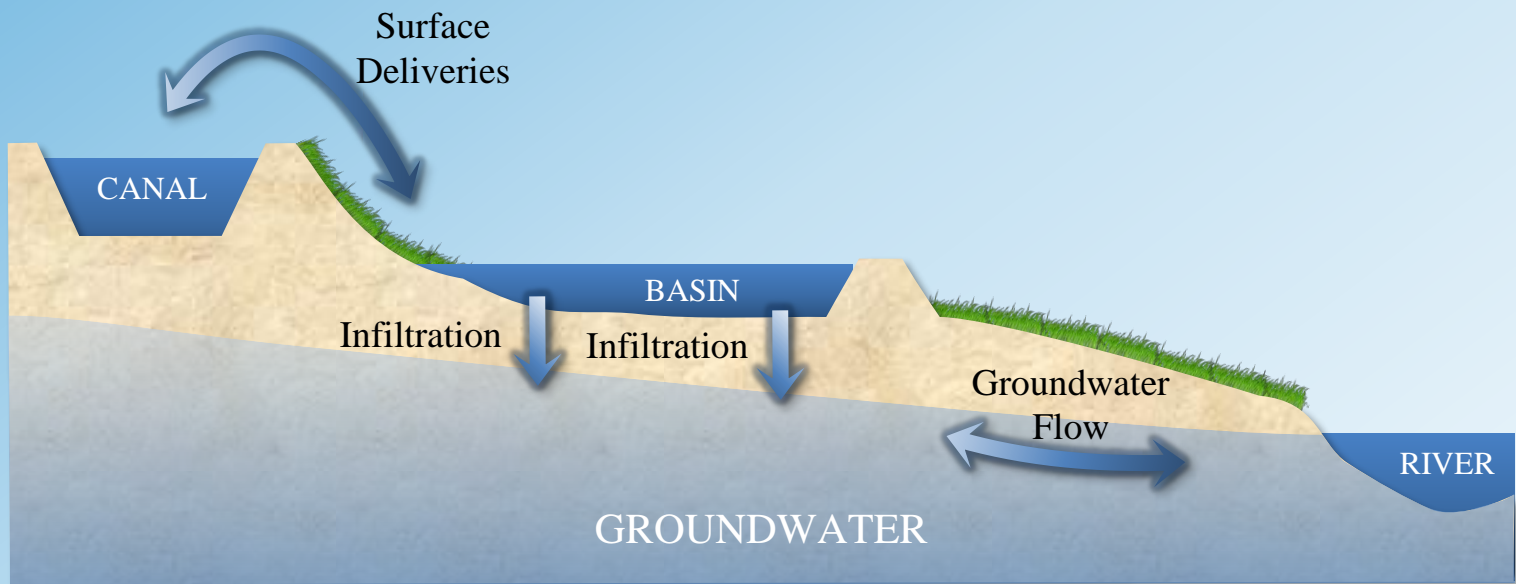


Presentation Outline

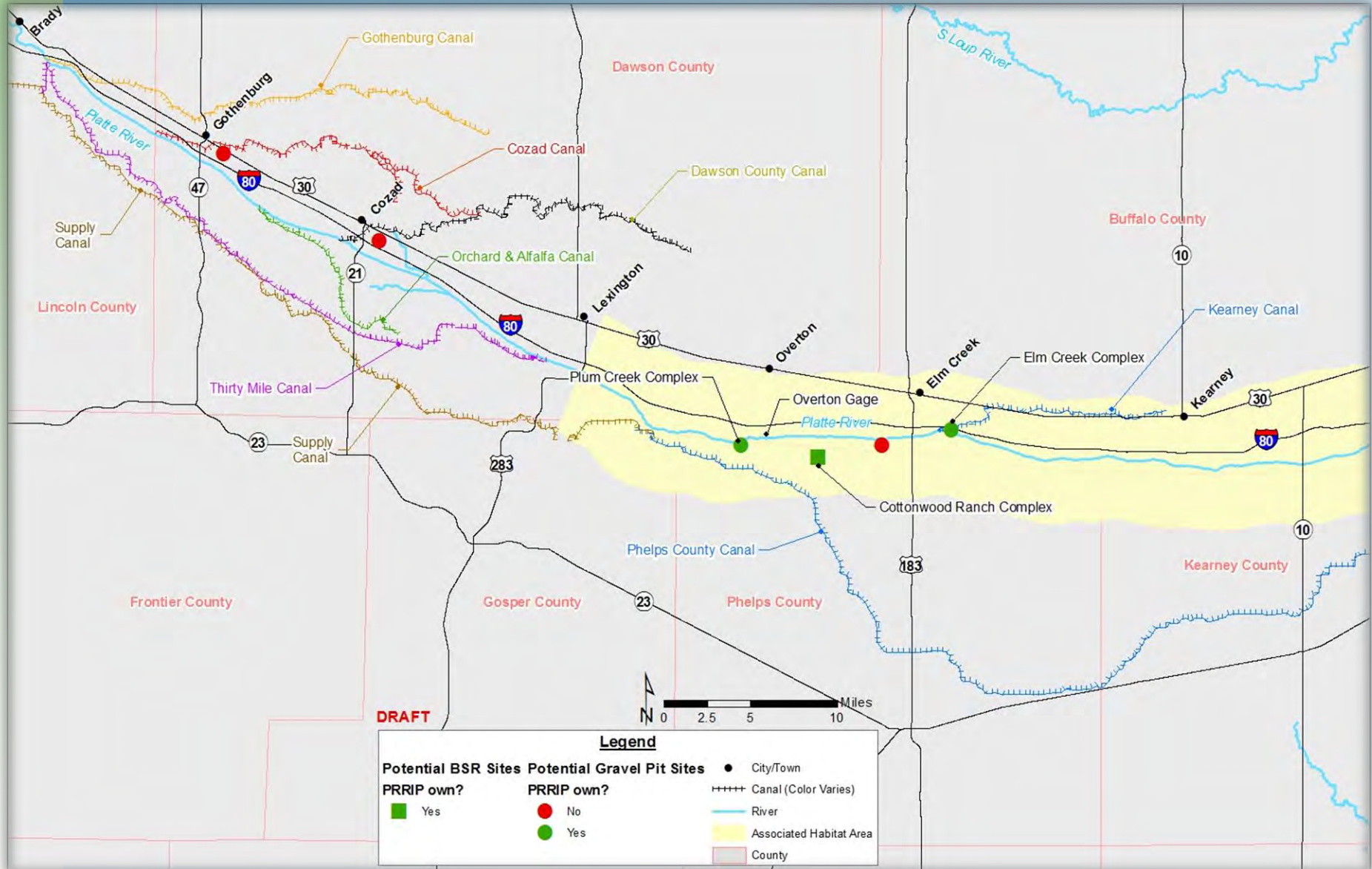
- ❑ General Concept
- ❑ Locations
- ❑ More details on CWR concept development
- ❑ Path forward



General Concept



Locations of Interest

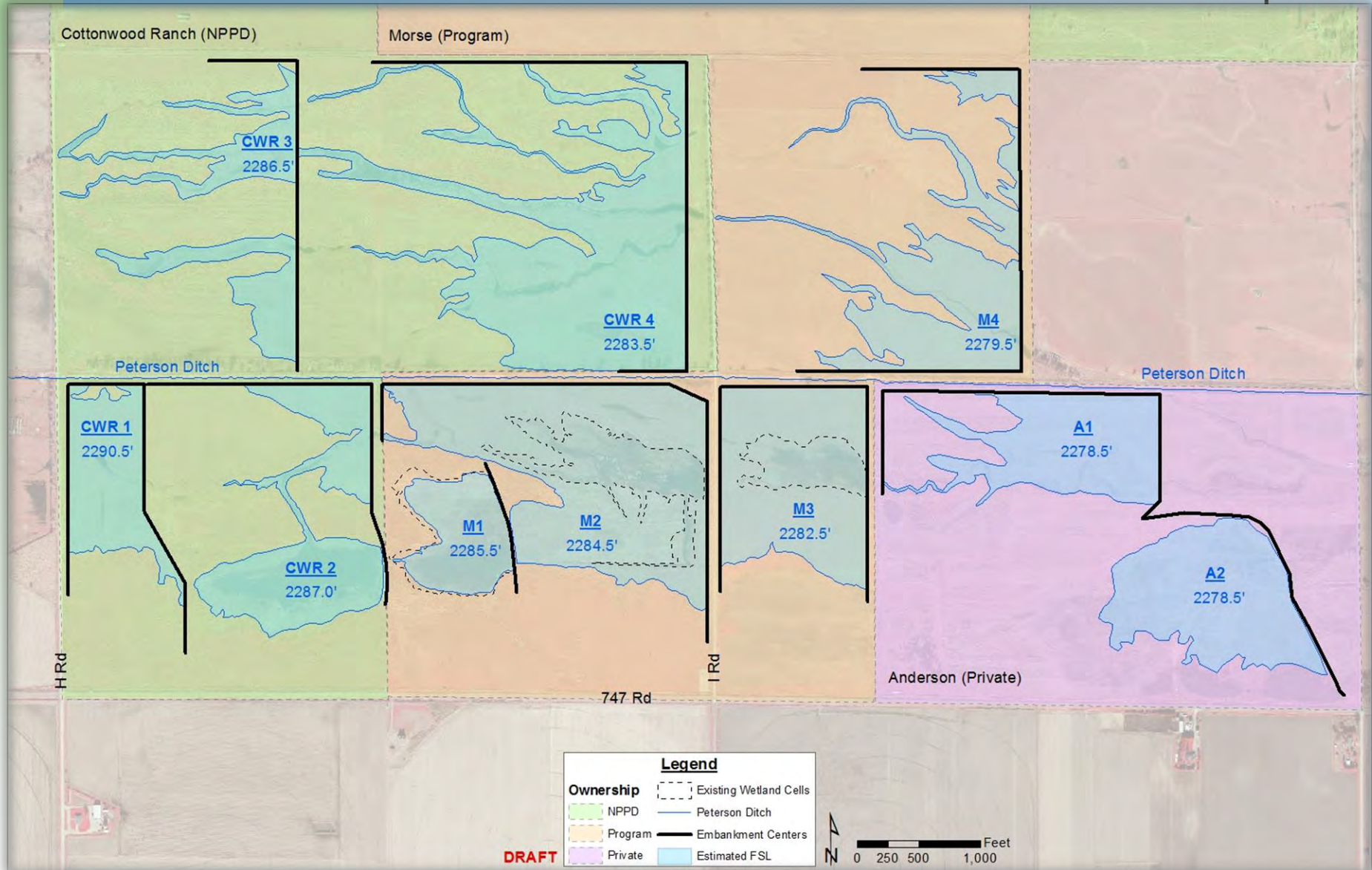


Locations

- Focus given to areas below canals and lands we own/manage
- Priority Locations:
 - Cottonwood Ranch (CWR)
 - Other lands below Phelps Co. Canal?
 - Other canals? (Orchard Alfalfa, 30-Mile, Cozad, etc.)



Cottonwood Ranch Concept



Cottonwood Ranch Concept

Property	Cell #	FSL* Elev. (ft)	FSL* Area (acres)	FSL* Vol (acre-ft)
CWR	1	2290.5	19.9	~23
CWR	2	2287	30.7	~32
CWR	3	2286.5	24.3	~17
CWR	4	2283.5	71.7	~80
Morse	1	2285.5	14.8	~17
Morse	2	2284.5	66.4	~108
Morse	3	2282.5	39.9	~74
Morse	4	2279.5	37.5	~27
Anderson	1	2278.5	27.6	~29
Anderson	2	2278.5	33.5	~35
<i>TOTAL</i>			366.3	~442

*FSL: Full Supply Level

Preliminary



Cottonwood Ranch Concept

Infiltration Pits

Excavated



Bermed



Preliminary Results

Pit	Dates	Avg. Inf (ft/d)
Bermed	3/22 – 3/30/16	0.34
Bermed	4/4 – 4/11/16	0.28
Bermed	6/29 – 7/12/16	0.24
Excavated	3/22 – 4/11/16	0.12
Excavated	6/29 – 7/12/16	0.09

Assumed Rates:

Bermed = 0.3 ft/d

Excavated = 0.1 ft/d



Cottonwood Ranch Concept

- Total Ponded Area @ Full Supply Level (FSL) = 366 ac
 - Grassland Areas = 286 ac
 - Low (i.e., wetland) Areas = 80 ac

- Recharge Rates Estimates @ FSL

- Grassland = (286 ac) x (0.3 ft/d)
= 86 ac-ft/d

- Low Area = (80 ac) x (0.1 ft/d)
= 8 ac-ft/d

- *Total* = 94 ac-ft/d (~47 cfs)

- Preliminary Score Estimate

- Score = (94 ac-ft/d) x (90 d) x (0.40)

- *Total* = 3,380 ac-ft

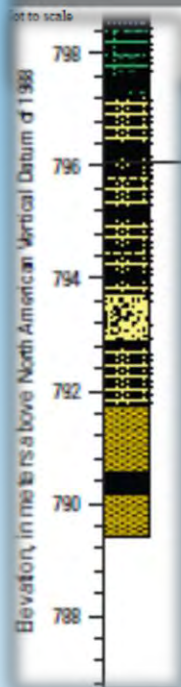
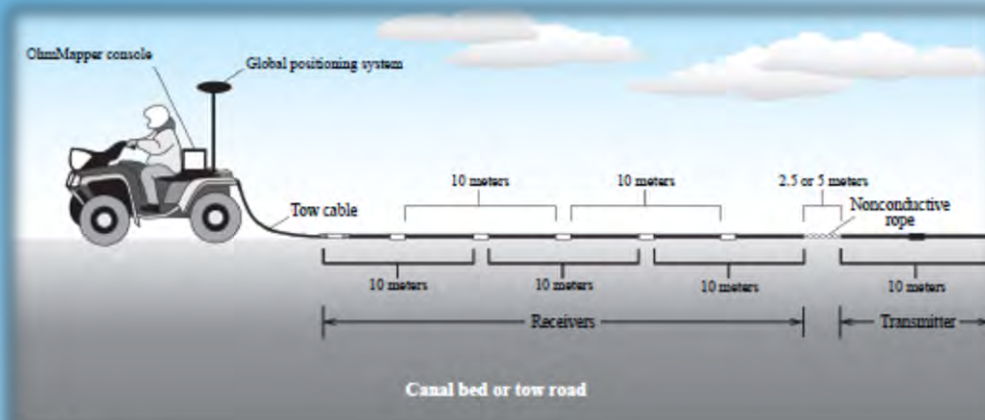


Cottonwood Ranch Concept

- Uncertainties
 - Subsurface?
 - Groundwater?
 - Habitat?

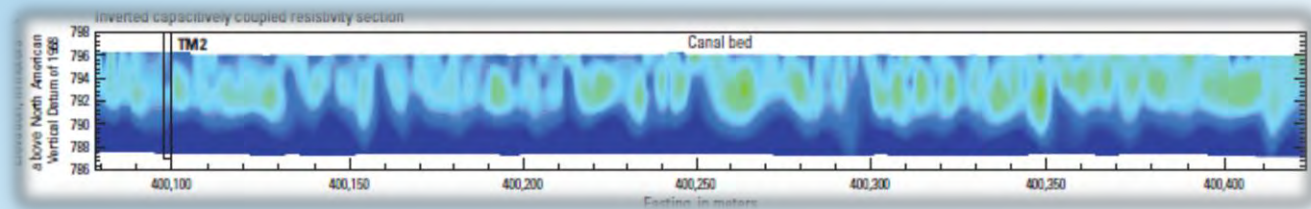


Subsurface?



EXPLANATION

- Optical wand and weight
- Receiver unit



EXPLANATION

Lithology

Label	Description
NS	No sample
OL	Organic silty clay-clayey silt
ML-SM	Sandy silt-silty sand
SC-SM	Clayey sand-silty sand
SM	Silty sand
SP	Sand, well sorted

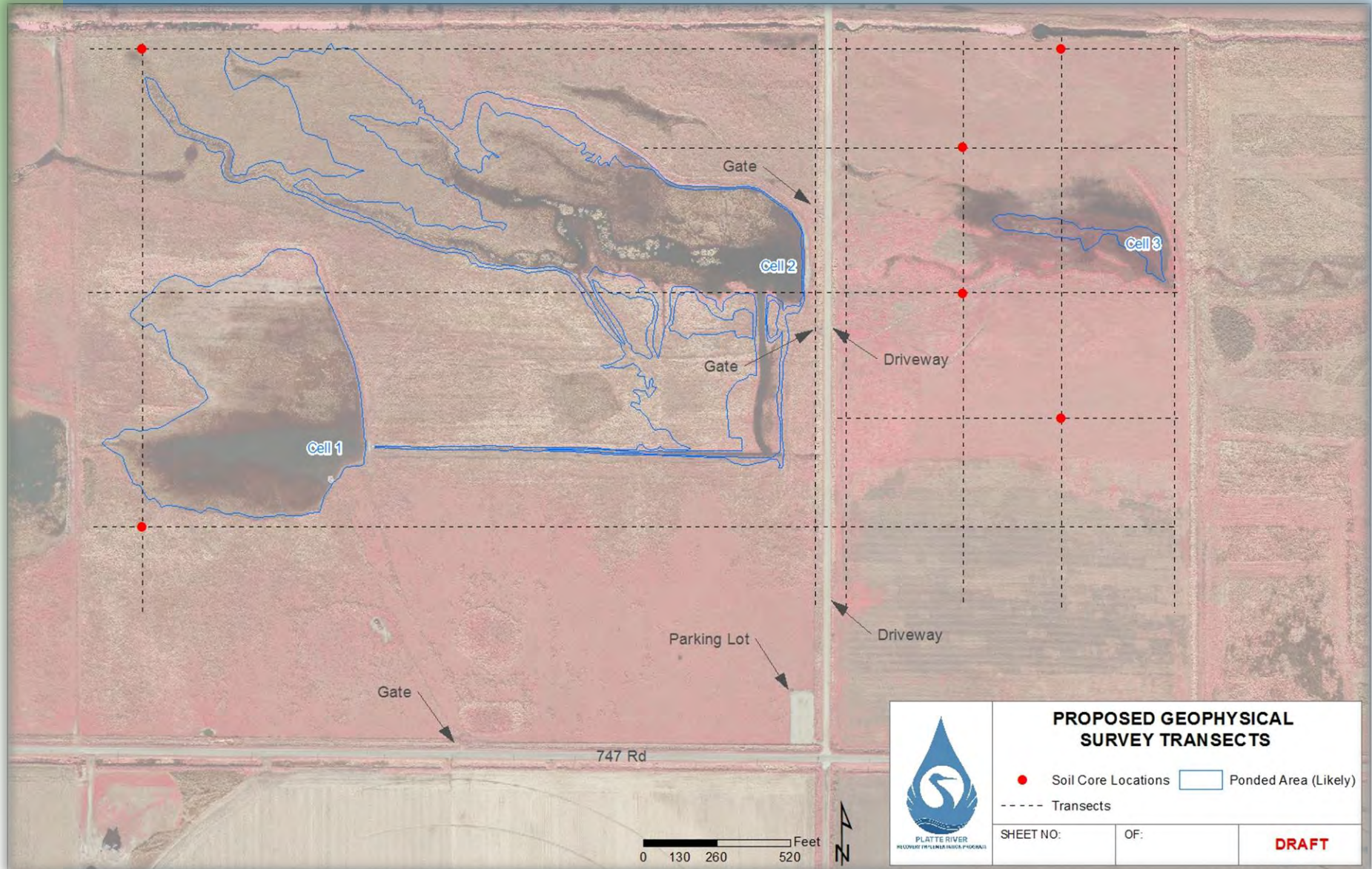
Canal location

- Surveyed section of canal
- Displayed section of canal

TM1

- Continuous sediment core and electrical conductivity log and identifier

Subsurface?

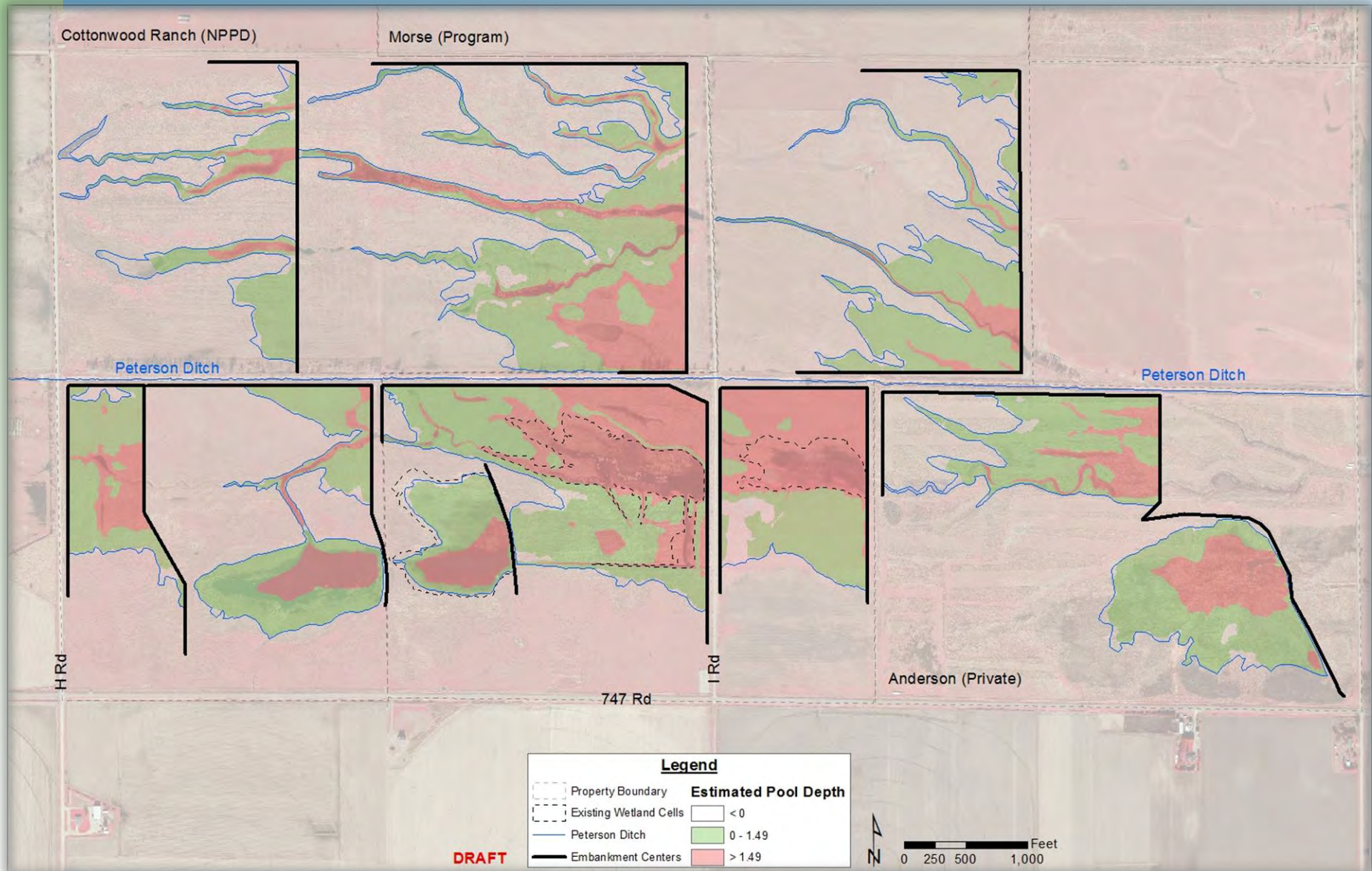


Groundwater?

- Model recently completed by EDO
 - ▣ Need to run scenarios
 - ▣ Will help determine influence of ditch, where **recharge water goes, etc. ...**
- Potential recapture options?
 - ▣ Similar to production well on the Cook property
 - ▣ Optimize returns/score



Habitat?



Habitat?

□ Preliminary Estimates

- About 366 acres of area (within FSL footprint):
 - ~ 3 acres with “depth” $\leq 0'$
 - ~ 242 acres with depth $0' >$ and $< 1.5'$
 - ~ 121 acres with depth $\geq 1.5'$
- If assume 55 acres of ponded area at current FSL (~40 acres @ Morse and ~15 acres at CWR):
 - Net gain of ~ 187 acres



Next steps at CWR

- Pipeline?
- Leasing and management agreements?
- Costs?
- Permits?



Other Properties / Recharge Sites

- For Plan B target of 12,000 AF/yr of score from BSR:
 - Additional ~8,600 AF/yr beyond CWR
 - Additional deliveries of ~21,600 AF/yr
 - If we can average 0.4 ft/d, we are looking at an additional 600 acres of ponded area
- Working to identify potential sites





Questions/Discussion