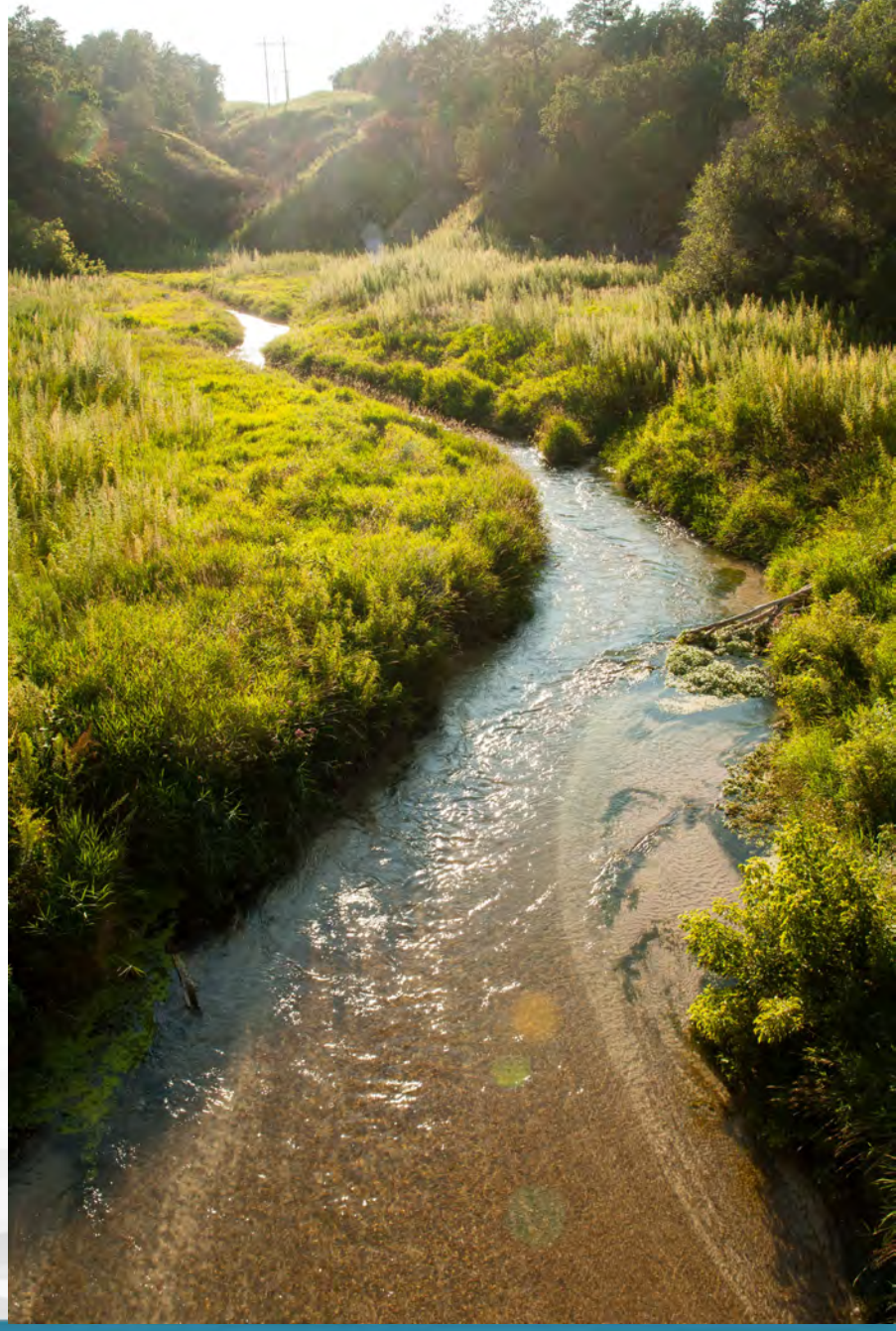
PUBLIC MEETING
LONG PINE CREEK WATERSHED PLAN-EA

6 August 2020

Agenda

- **Introductions / Sign-in**
- **Short Presentation**
  - Project Scope
  - Analysis
  - Field Data Collection
  - Potential Project Sites
- **Group Discussion**



Introductions

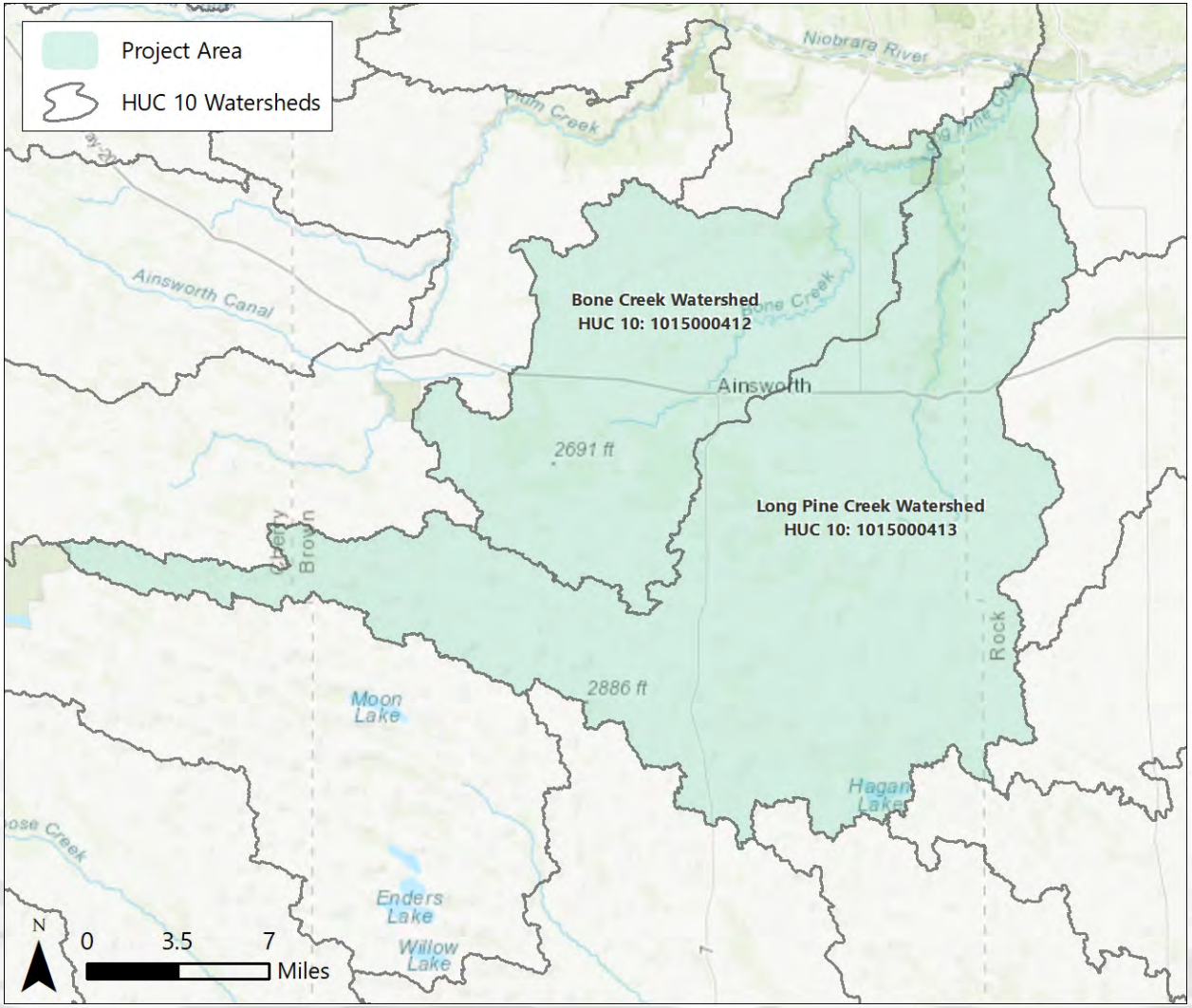
Mike Murphy, General Manager
Chandler Schmidt, Watershed Coordinator

Janel Kaufman, Project Manager, Environmental
Charles Ikenberry, Water Quality

Missy Baier, Archeologist

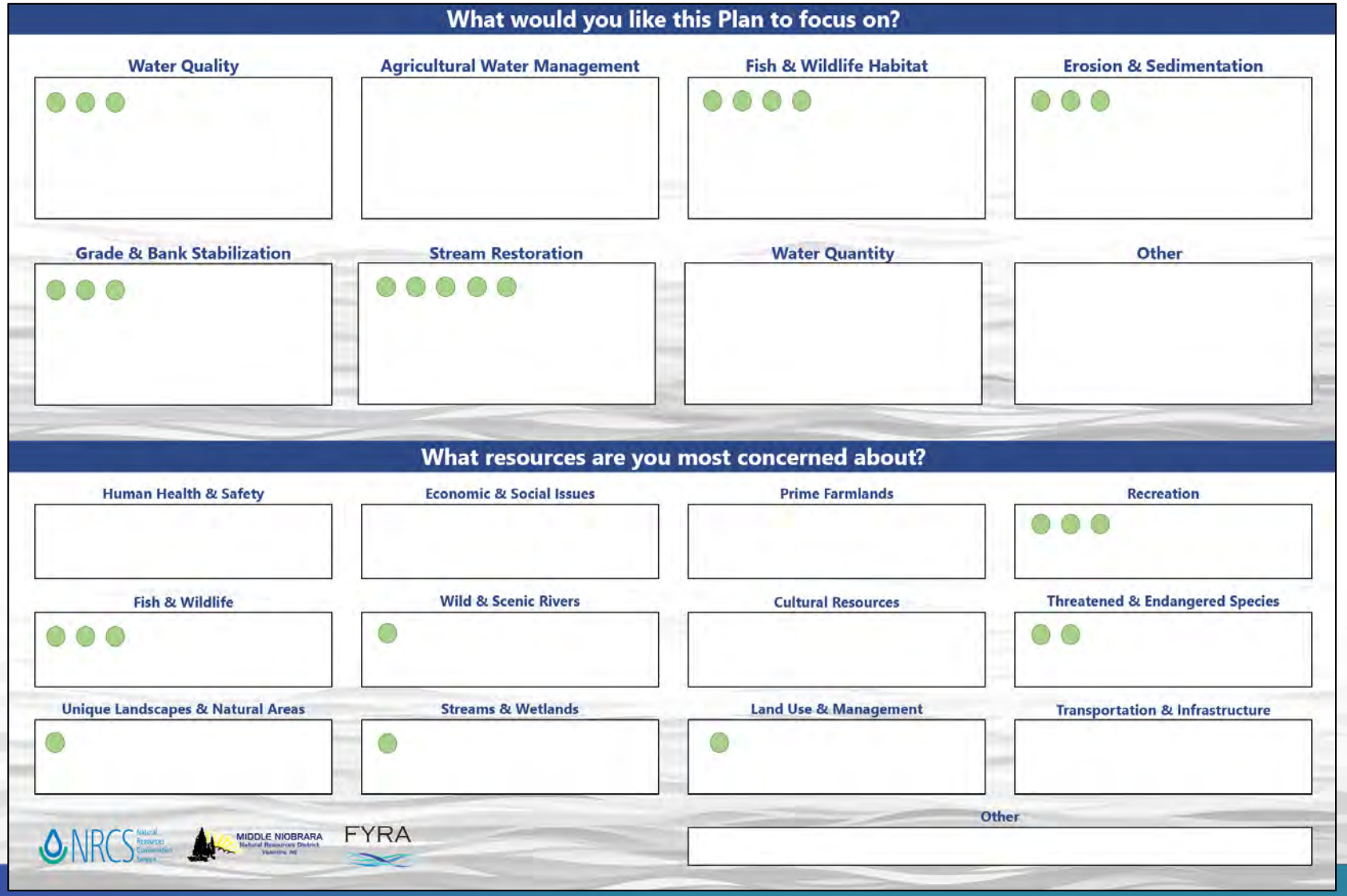
Project Background

PROJECT BOUNDARY



Project Background

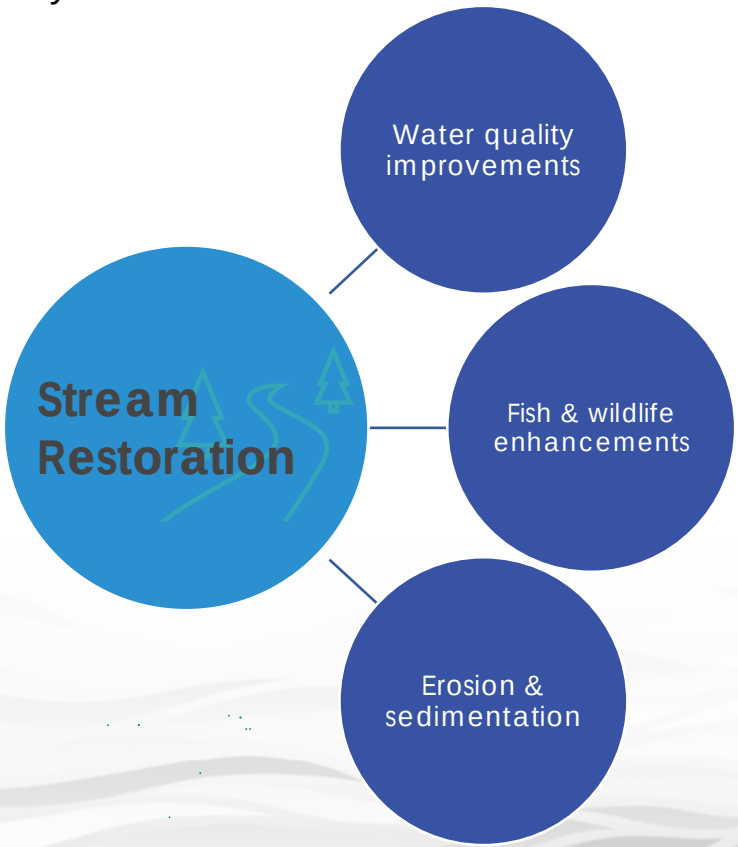
SCOPING MEETING



Project Purpose

SCOPE

Stream Restoration. Restoring streams can help provide grade stabilization, improve bank stability, improve aquatic habitat, and benefit water quality.



Thinking about Scale of Alternatives

SPREAD-OUT VS. FOCUSED

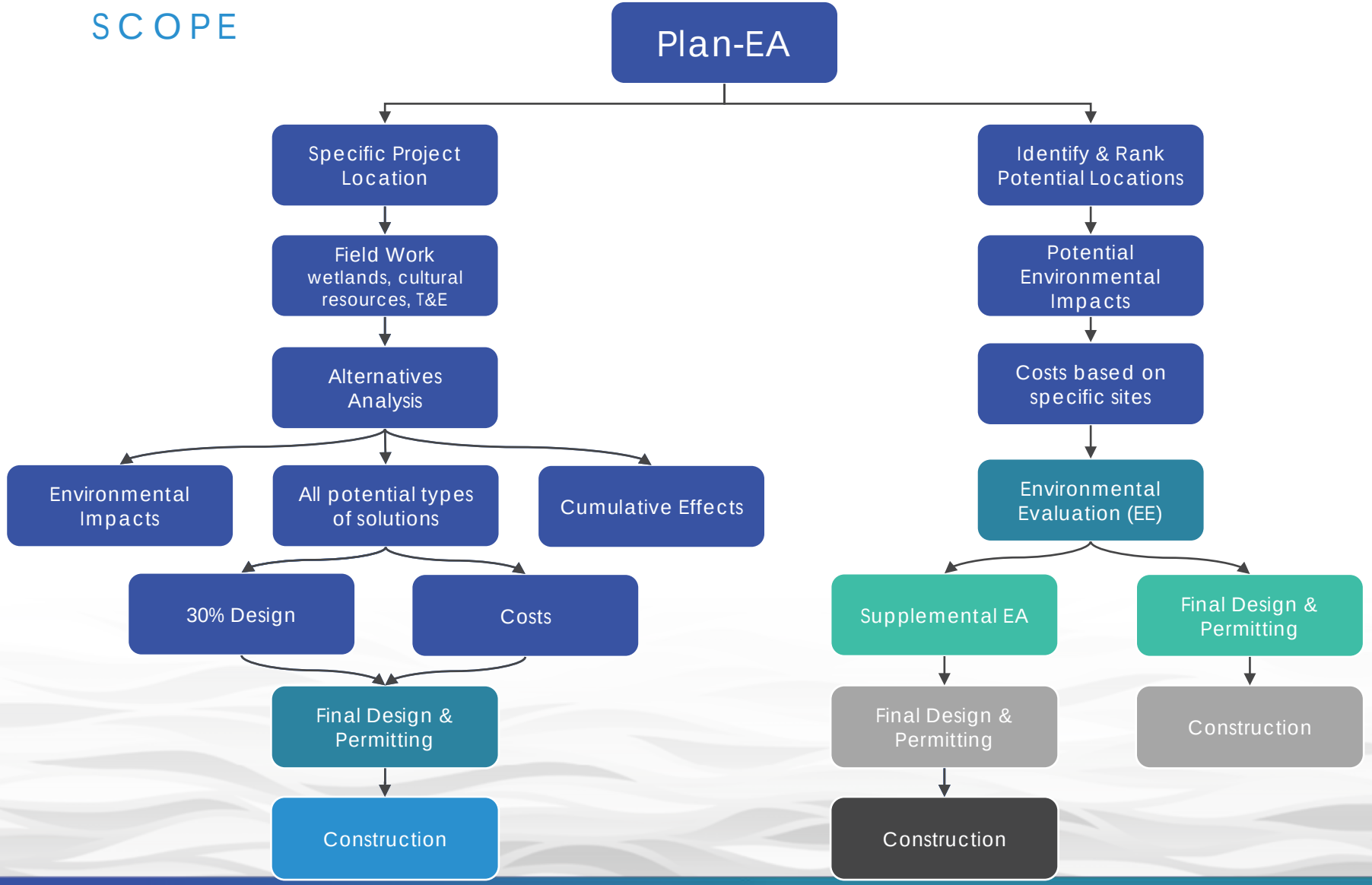
- **Resolution (scale) of solutions**
  - Parcel level vs. local vs. regional alternatives

FYRA ENGINEERING

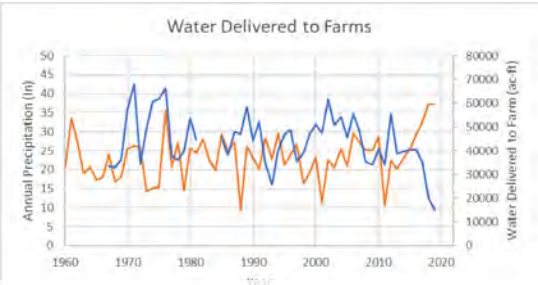
Current Phase

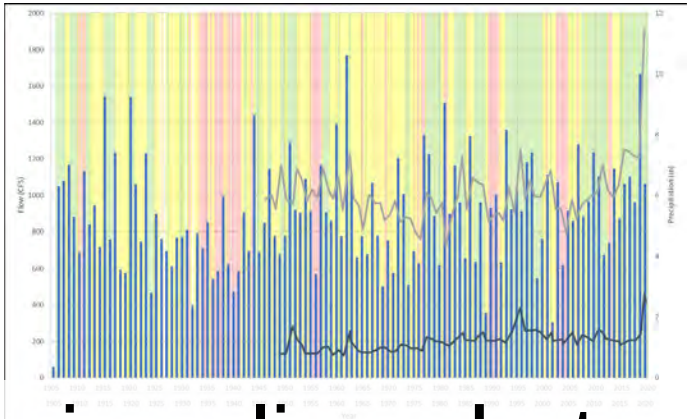
Project Planning

SCOPE

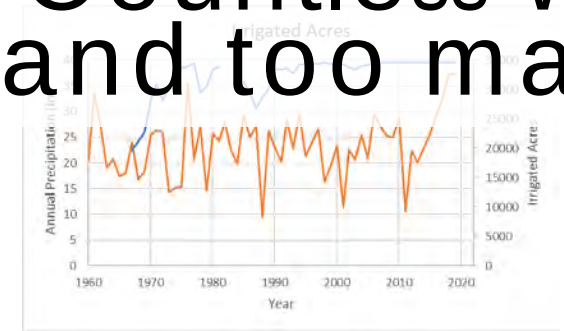


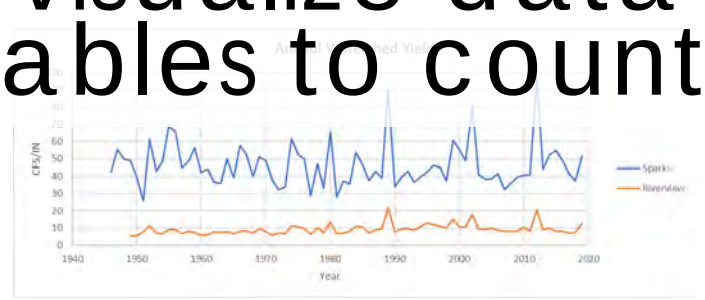
Data Analysis

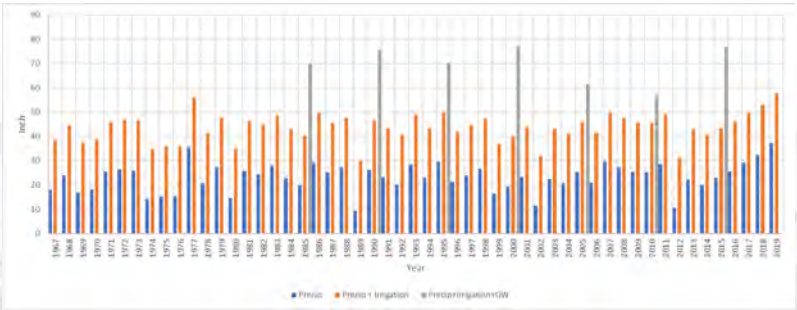


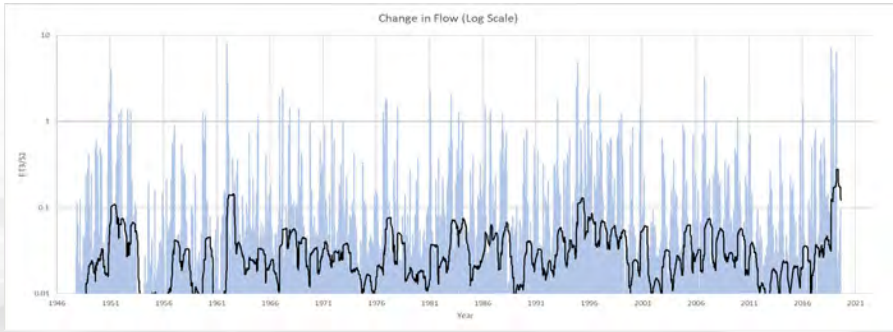


Countless ways to visualize data and too many variables to count





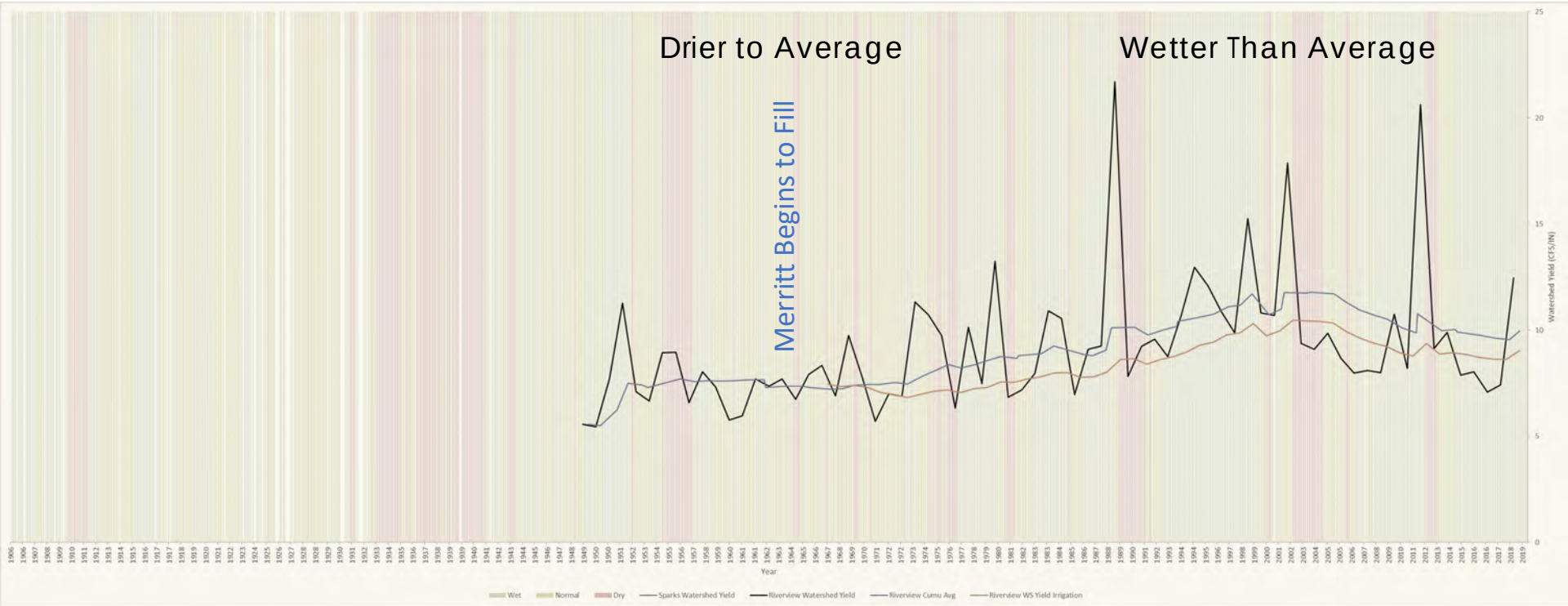




Data Analysis

LONG PINE CREEK – WATERSHED YIELD

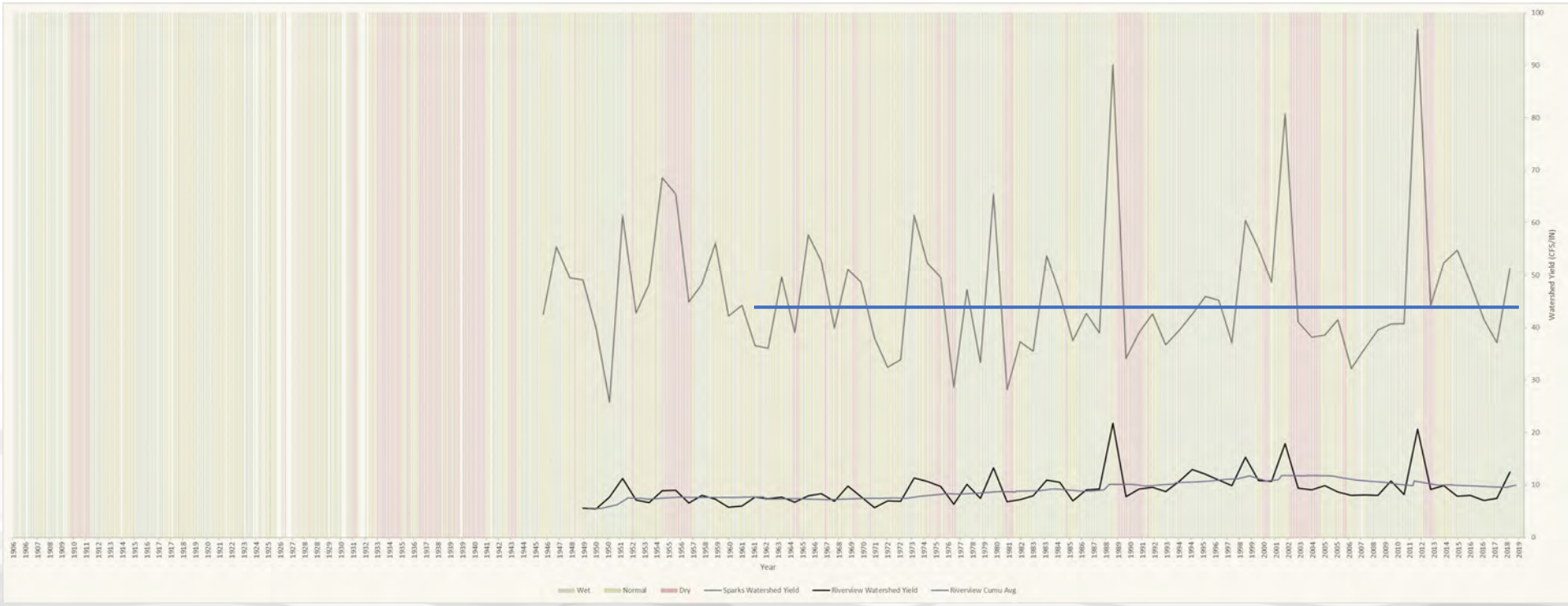
- Quantifies how much water runs off from an inch of rainfall
- Should be reasonably constant when averaged over a year's rainfall
- Drought vs wet periods - much wetter than average since 1976
- Increasing trend until 2002, then decreasing
- Irrigation adds to this runoff, but doesn't account for all of the change (orange line versus blue line).



Data Analysis

LONG PINE CREEK vs. NIOBRARA RIVER

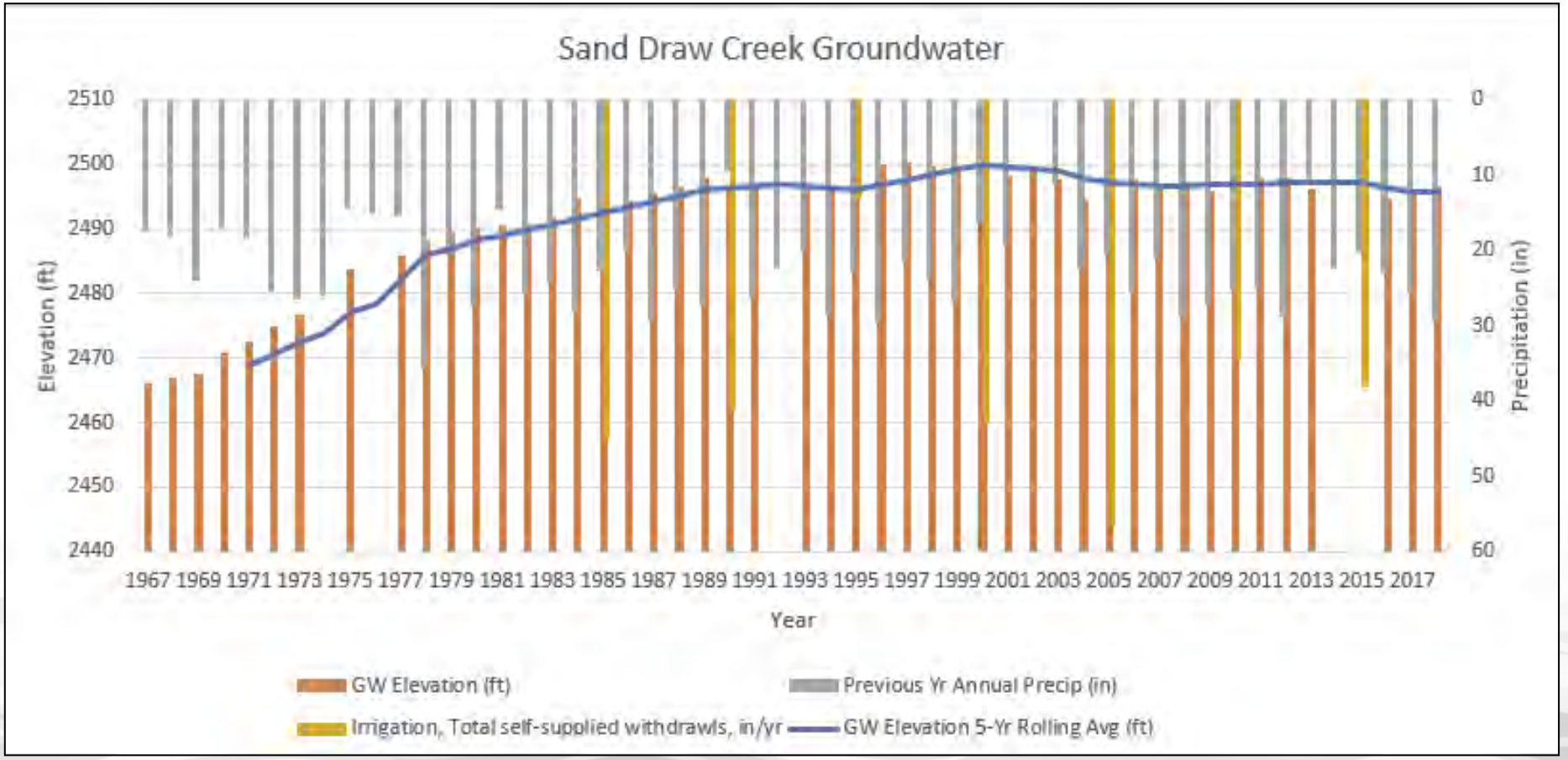
- Same trend isn't evident in Niobrara River or other area gages
- Cause isn't meteorological or climatic in nature



Data Analysis

GROUNDWATER

- Groundwater increased to about 2000, and has been decreasing ever since



Data Analysis

SEDIMENT FLUX

- Sediment is transported from the uplands into the stream through general site erosion
- These sand and gravels are transported through the stream where they get sorted by size (coarsest materials higher up in the watershed)
- During significant flood events, mobile bed streams can become sediment starved as the transport of material exceeds the supply. This exacerbates degradation of the stream channel
- However, this is a cycle for many streams and the streams will begin to aggrade in the future again
- Reducing erosion in the uplands can cause issues in the downstream portions of the streams by eliminating sediment sources.
    - Long Pine Creek – no large scale groundwater elevation changes, the above average rainfall over recent decades has increased sediment load to the stream.
- There are side effects to projects

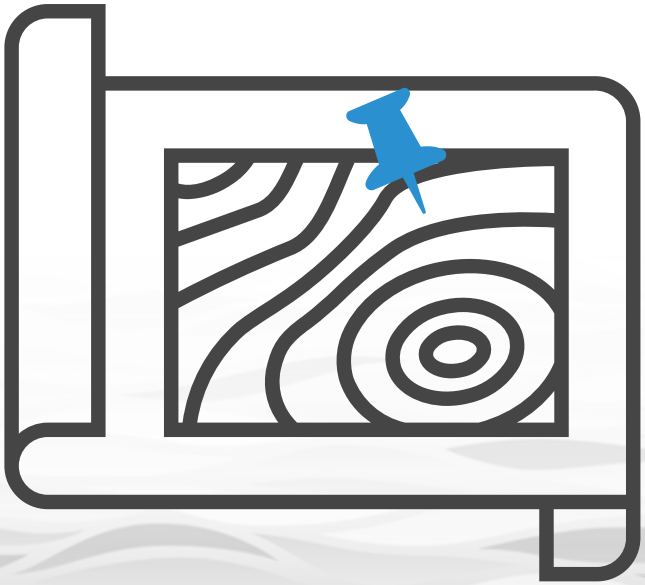
Data Analysis

CHANNEL EVOLUTION

Field Data Collection

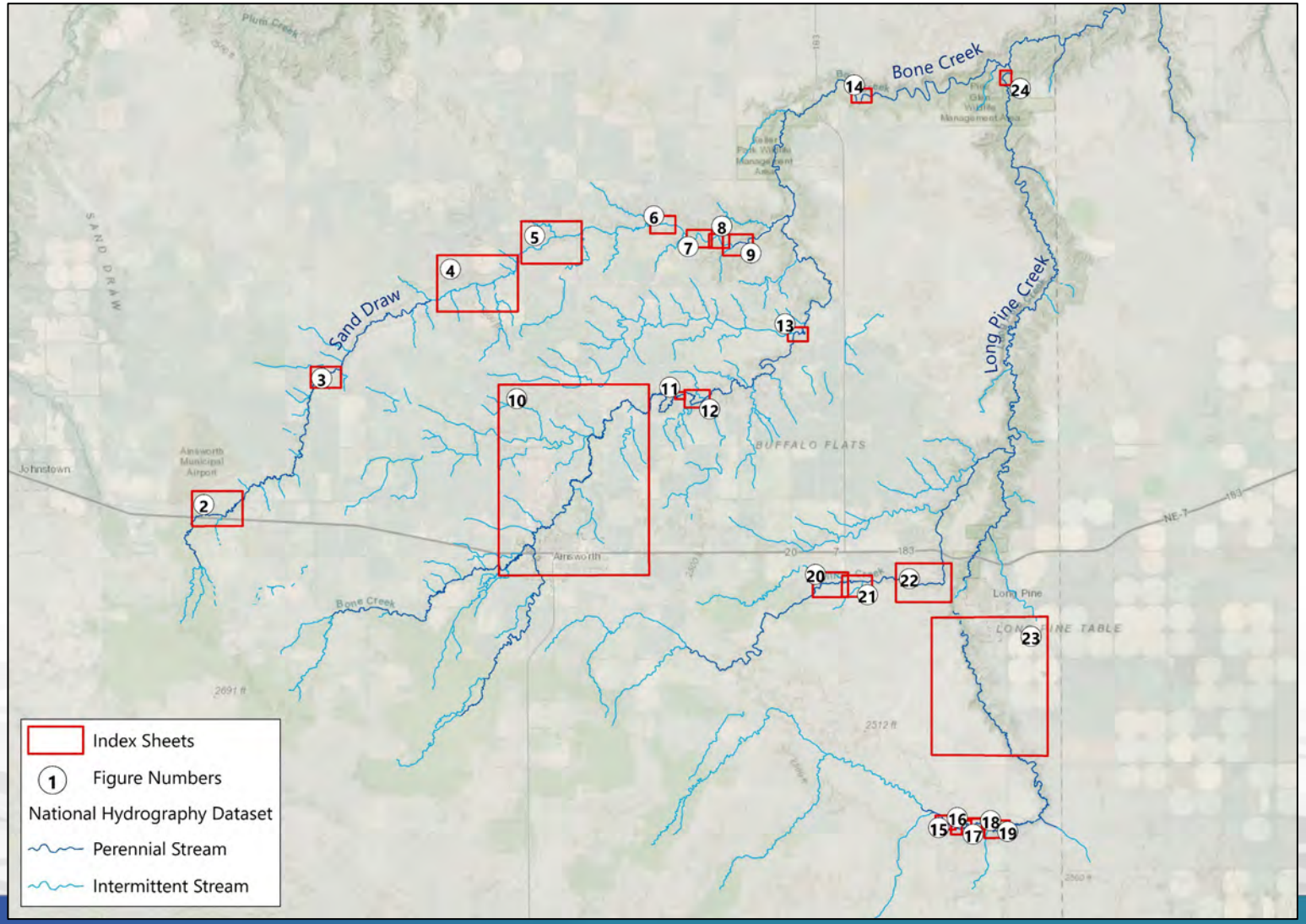
SITE SELECTION

- Locations identified at the scoping meetings
- Landowner input
- NRCS field office
- MNNRD



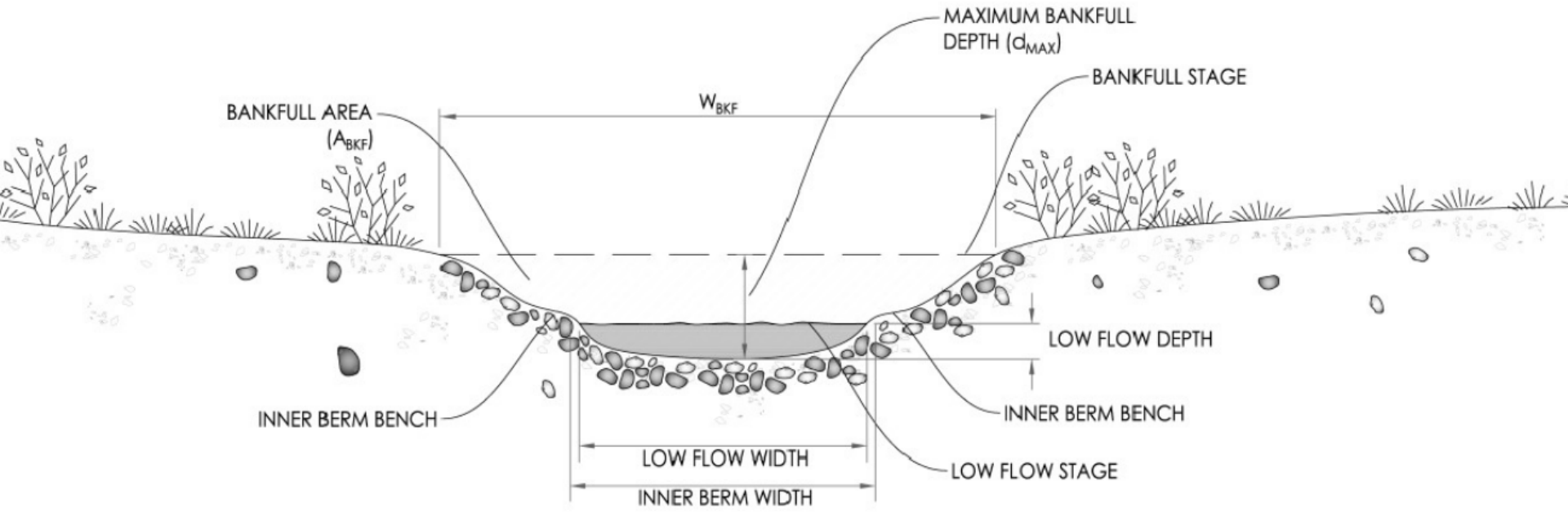
Field Data Collection

SITES VISITED



Stream Assessment

CHANNEL GEOMETRY

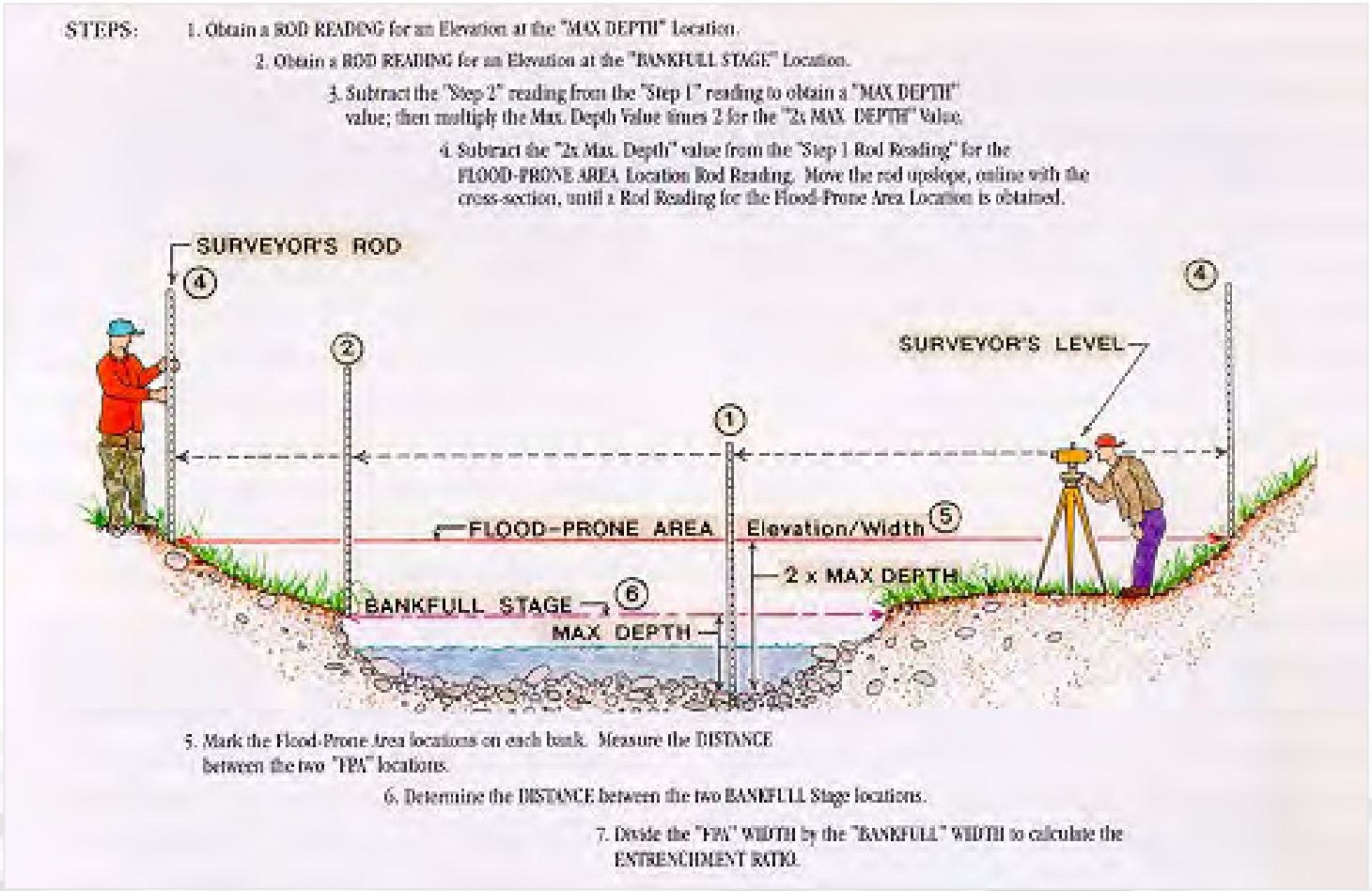


MEAN BANKFULL DEPTH = (BANKFULL AREA)/(BANKFULL WIDTH)

WIDTH-TO-DEPTH RATIO = (BANKFULL WIDTH)/(AVERAGE BANKFULL DEPTH)

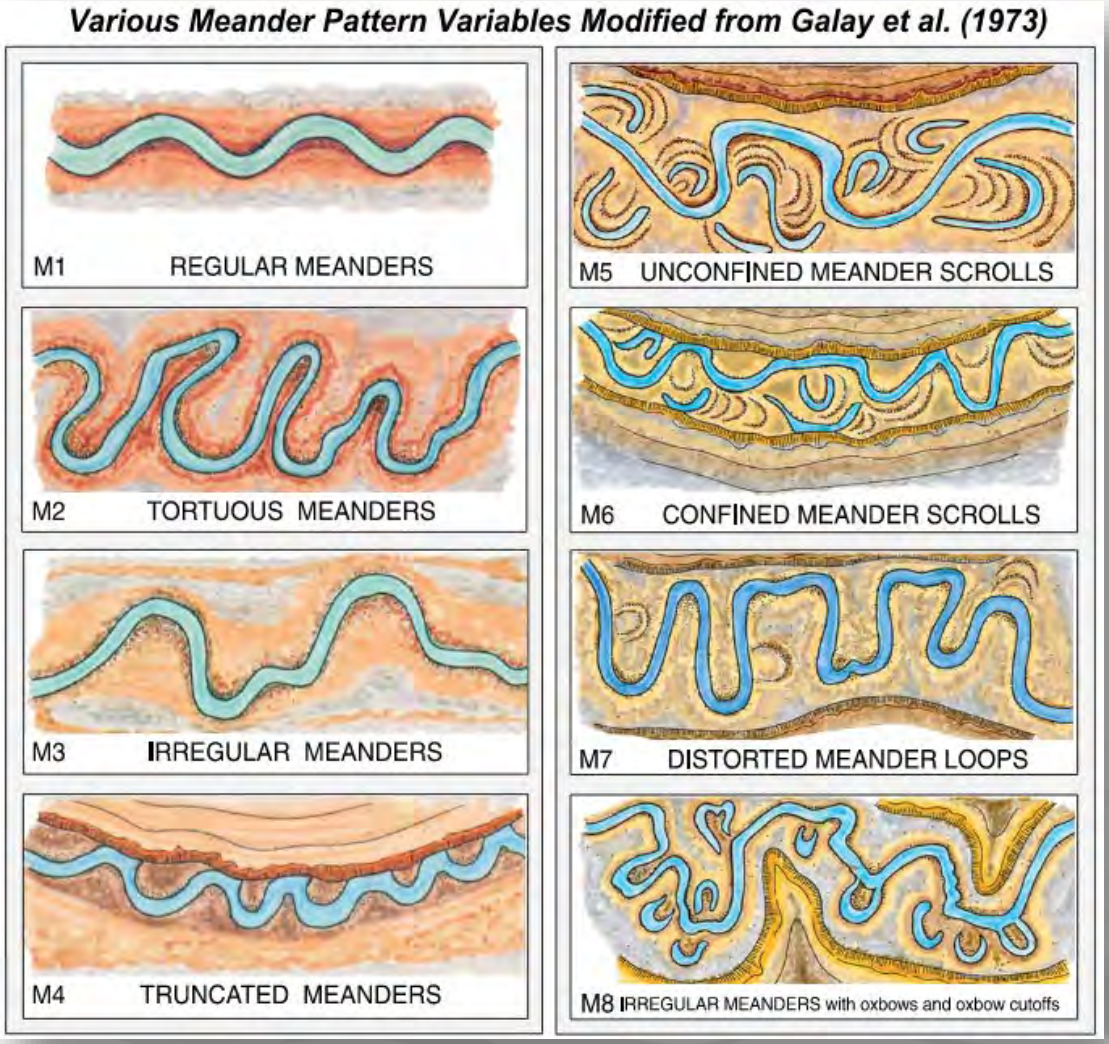
Stream Assessment

CHANNEL GEOMETRY



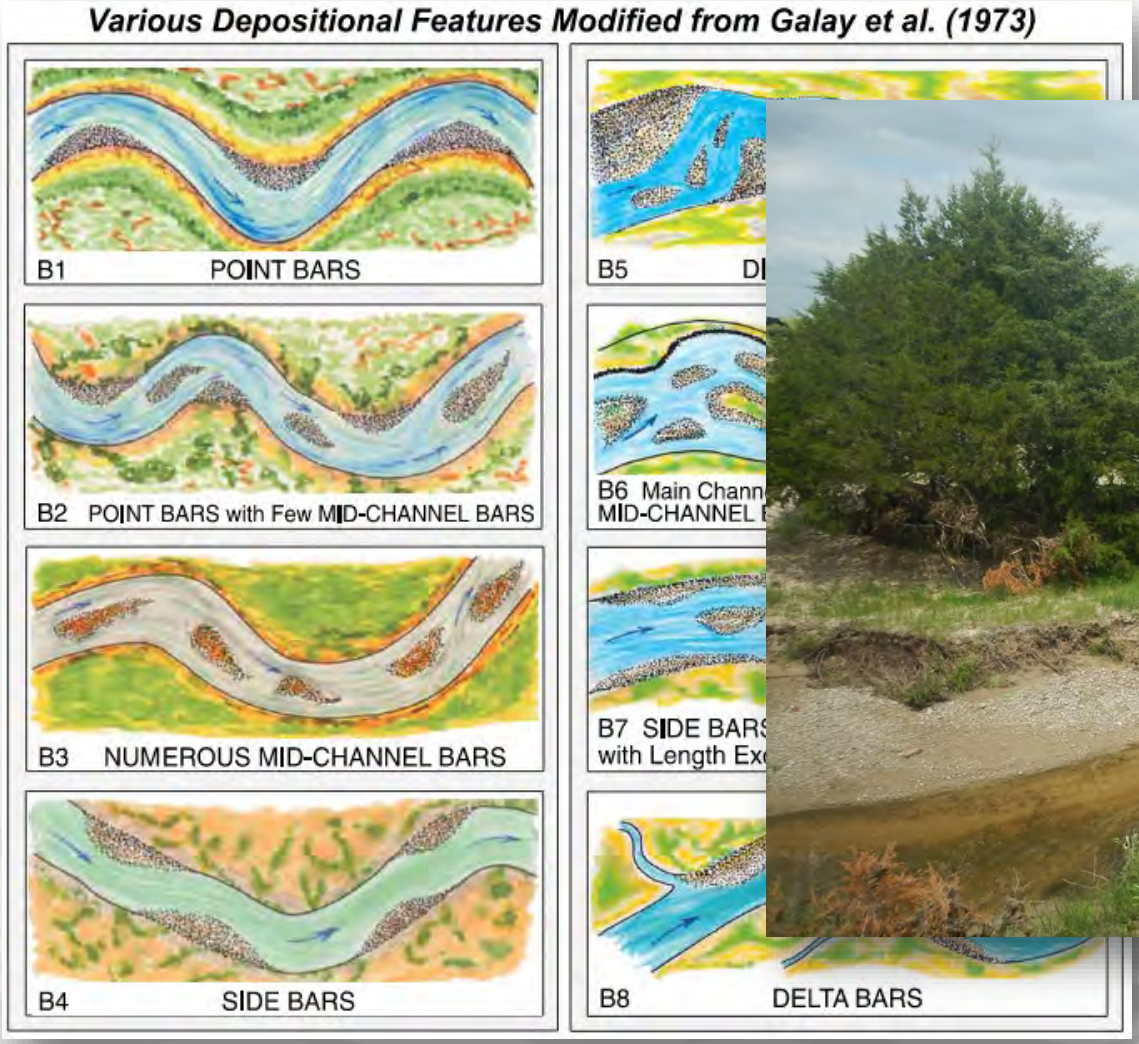
Stream Assessment

MEANDER PATTERN



Stream Assessment

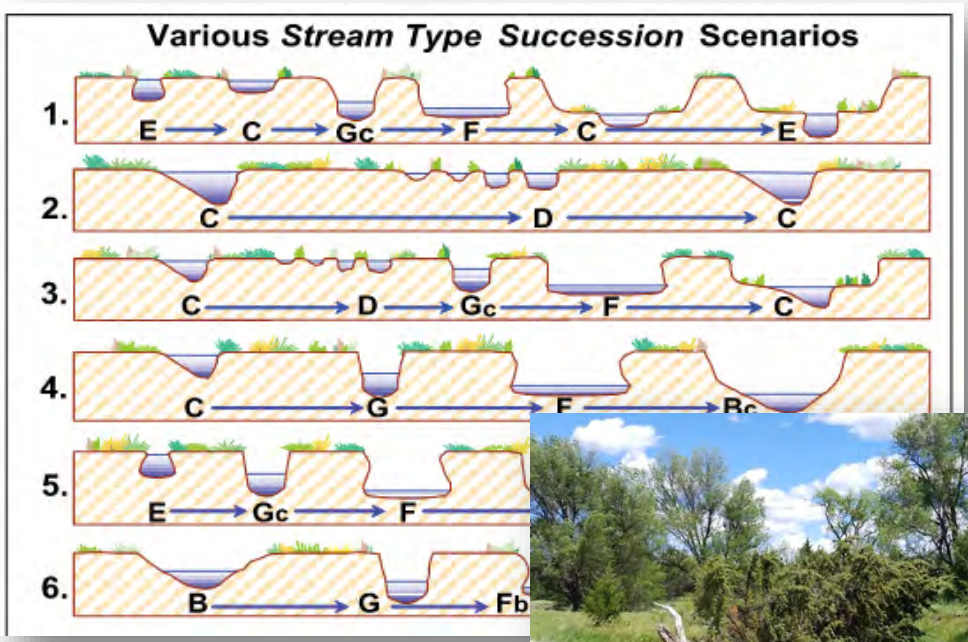
DEPOSITIONAL FEATURES

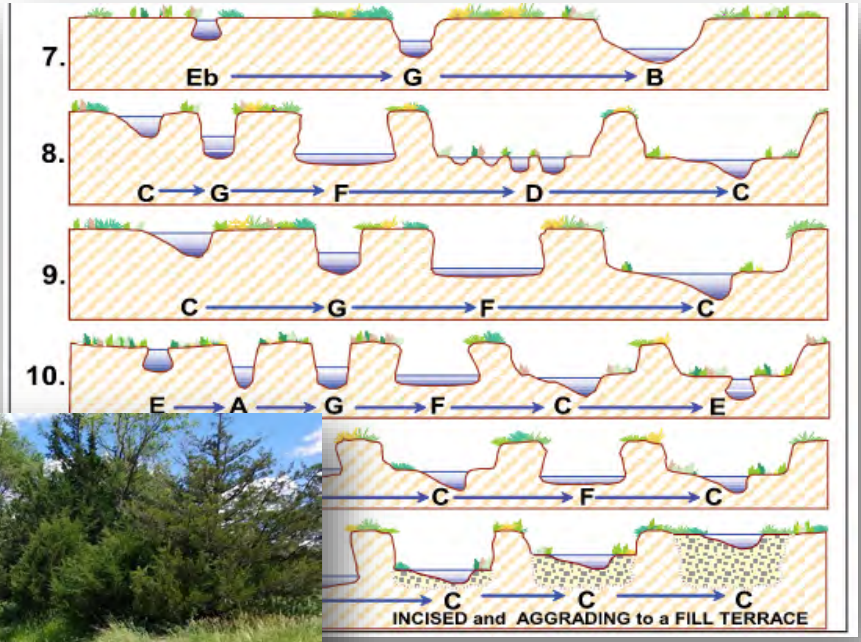


Rau Property (6/8/2020)

Stream Assessment

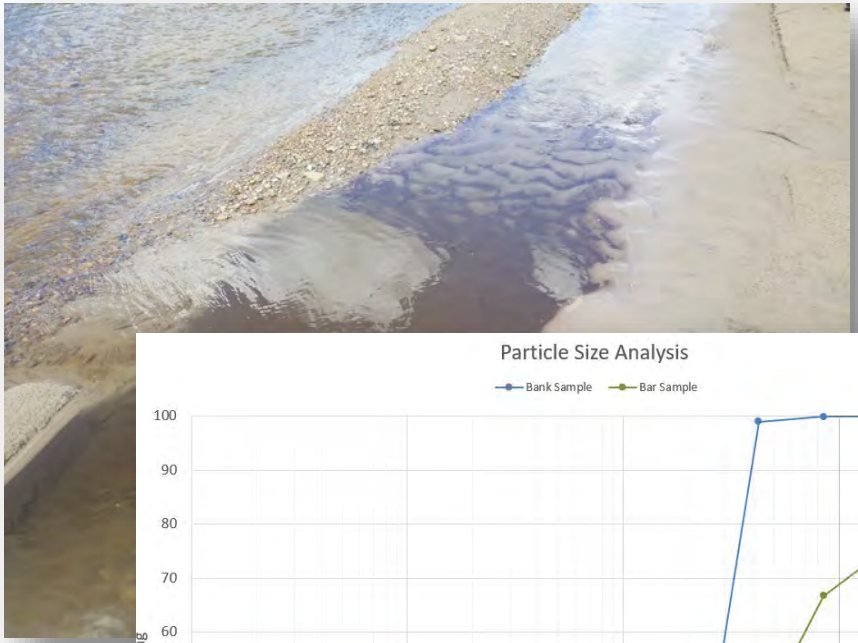
CHANNEL SUCCESSION

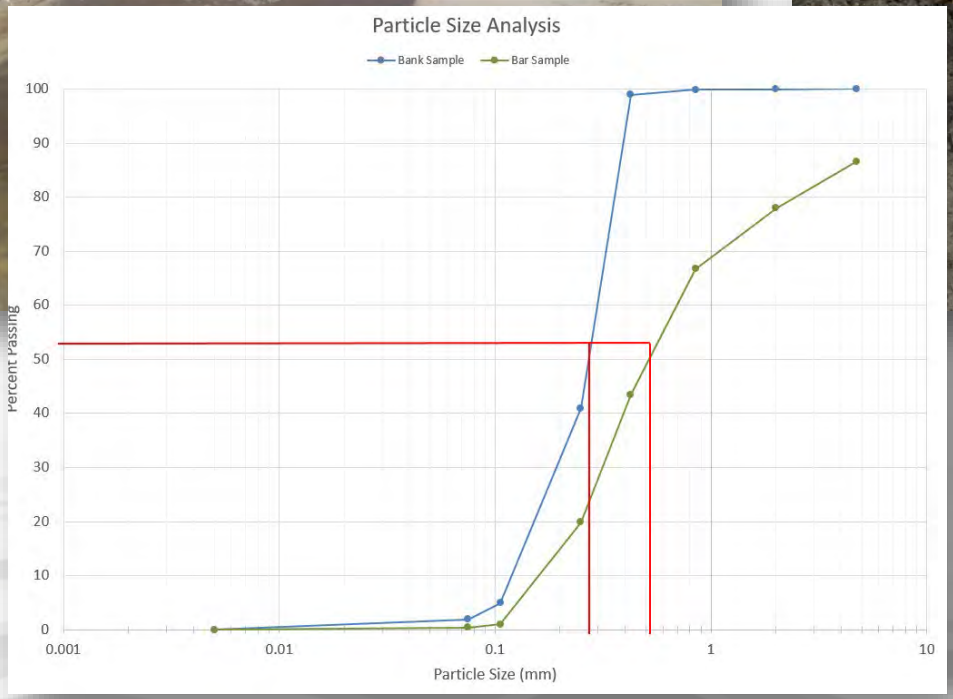




Stream Assessment

SEDIMENT CHARACTERISTICS





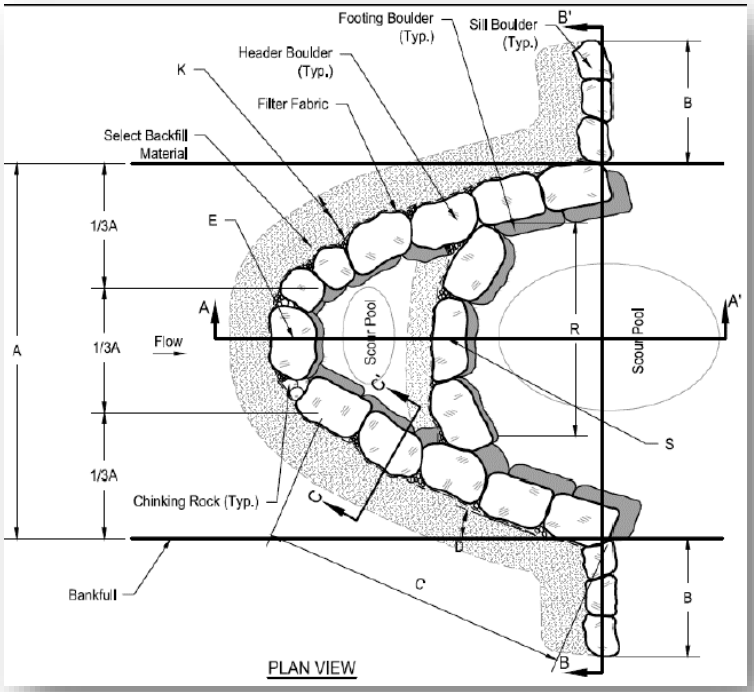
Stream Restoration Practices

"SOFT" OR NATURAL APPROACHES

Bank/Bench Shaping

Stream Restoration Practices

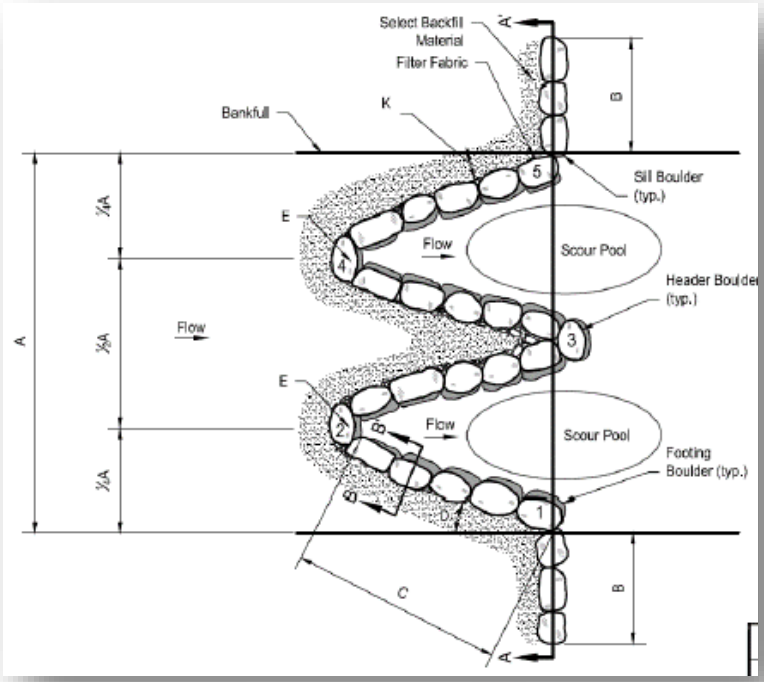
"SOFT" OR NATURAL APPROACHES



Cross Vanes

Stream Restoration Practices

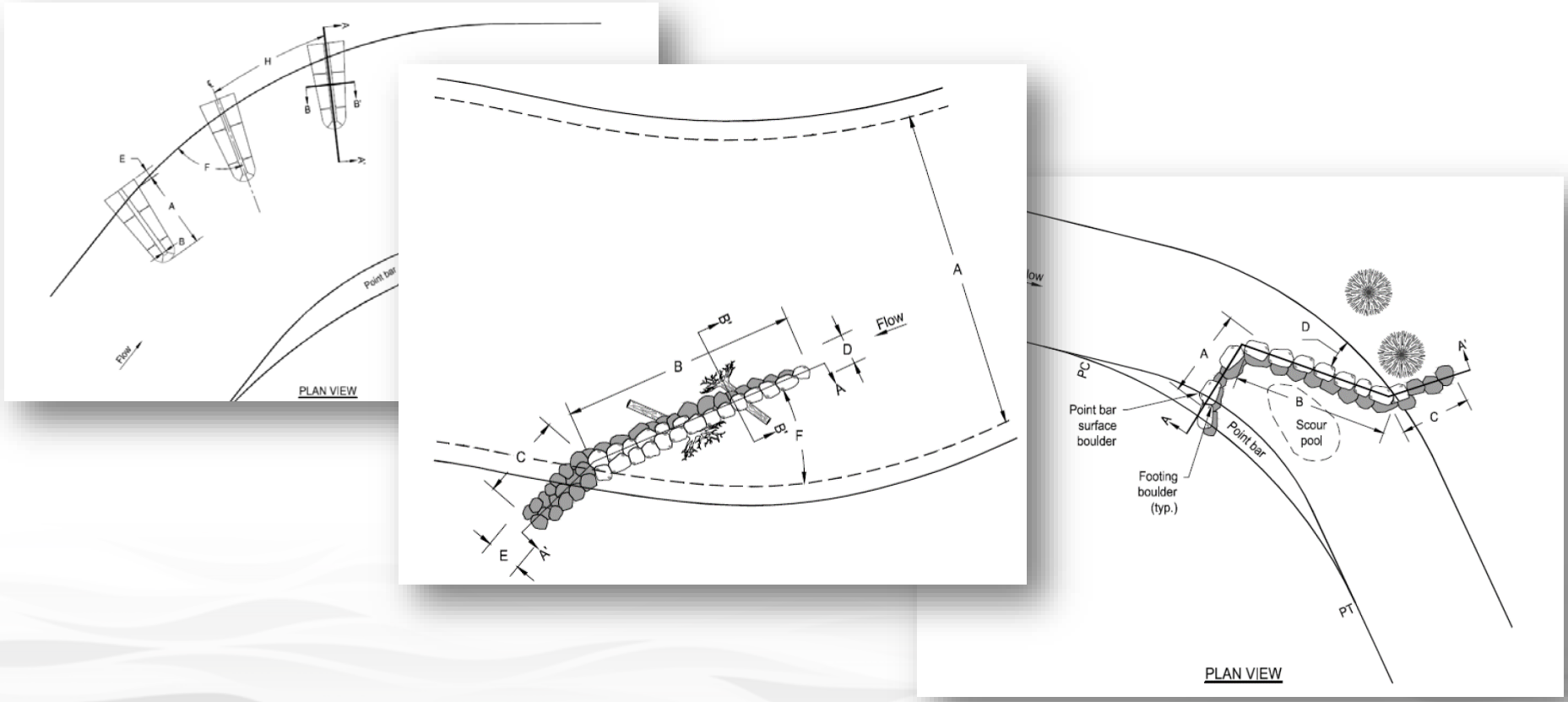
"SOFT" OR NATURAL APPROACHES



"W" Weirs

Stream Restoration Practices

"SOFT" OR NATURAL APPROACHES



Barbs, Bendways, and J-Hooks

Stream Restoration Practices

"SOFT" OR NATURAL APPROACHES

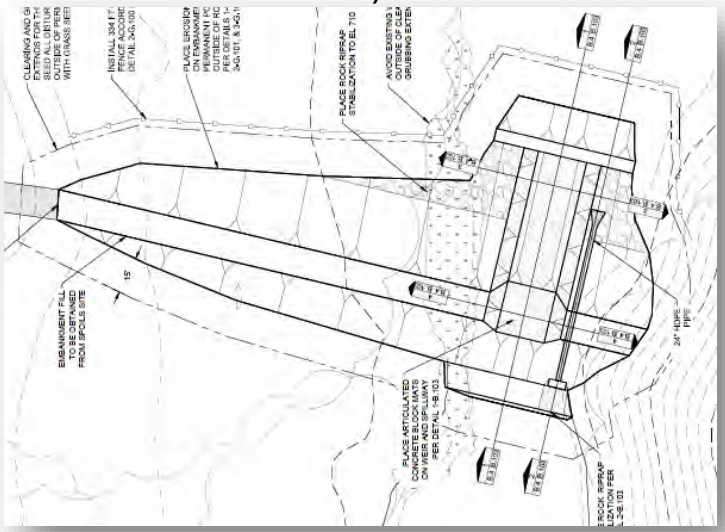
J-Hooks

Bendways

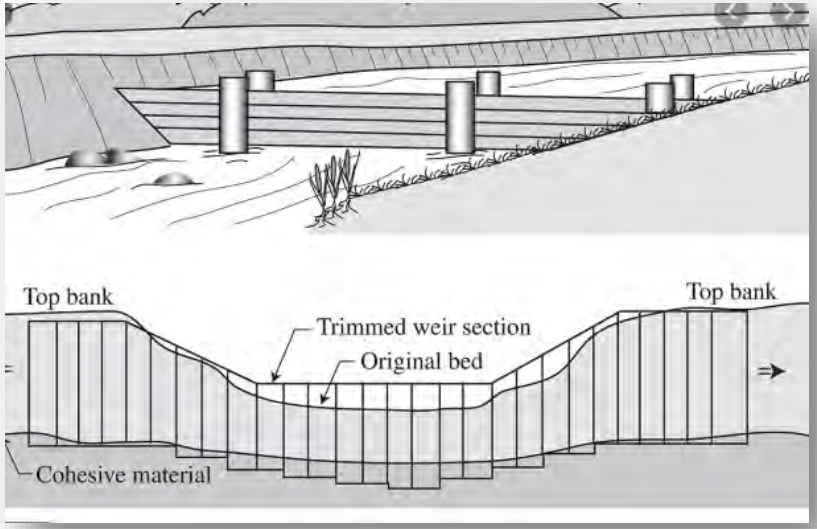
Stream Stabilization Practices

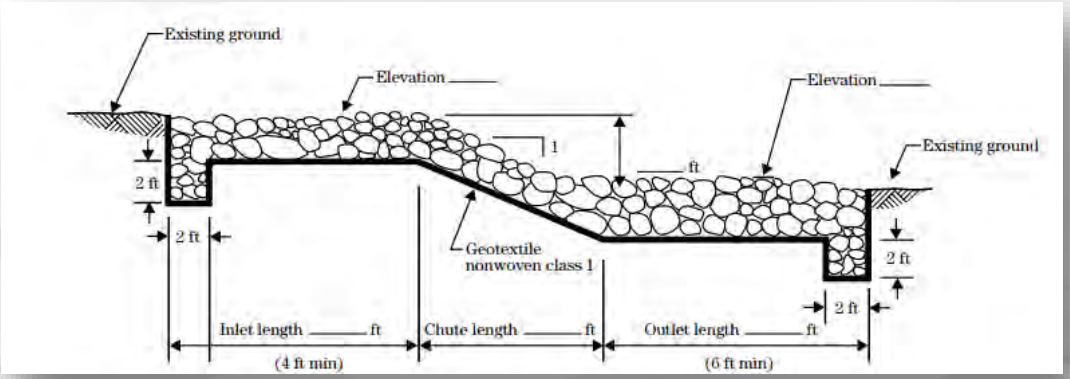
"HARD" GRADE CONTROL STRUCTURES

Small Dams/Ponds

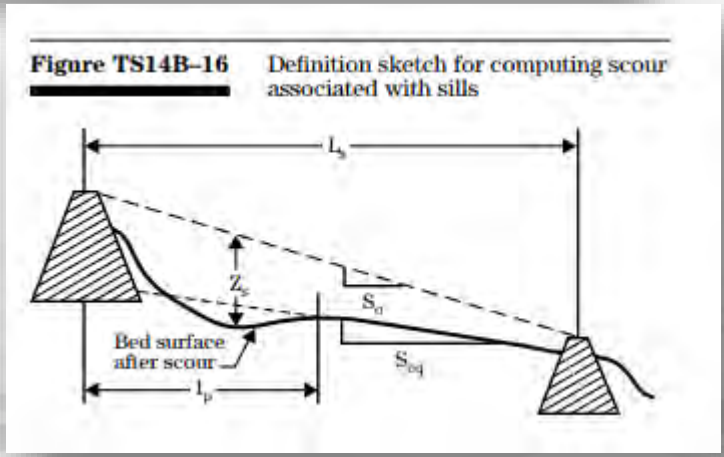


Sheet Pile Weirs





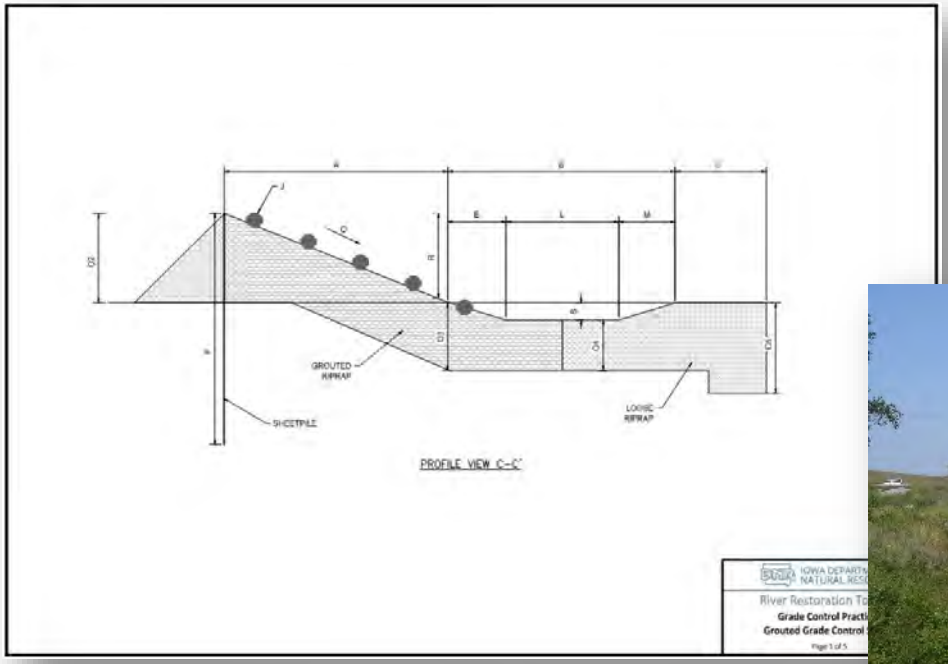
Rock Ramps (Chutes)



Rock Sills

Stream Stabilization Practices

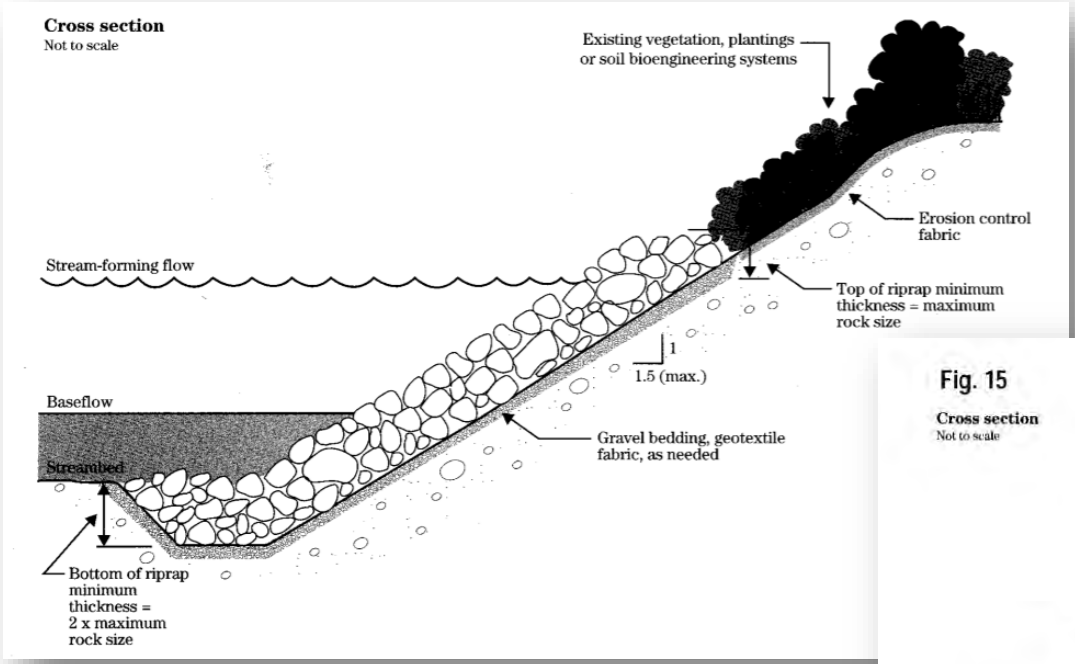
"HARD" GRADE CONTROL STRUCTURES



Rock Ramps (Grouted)

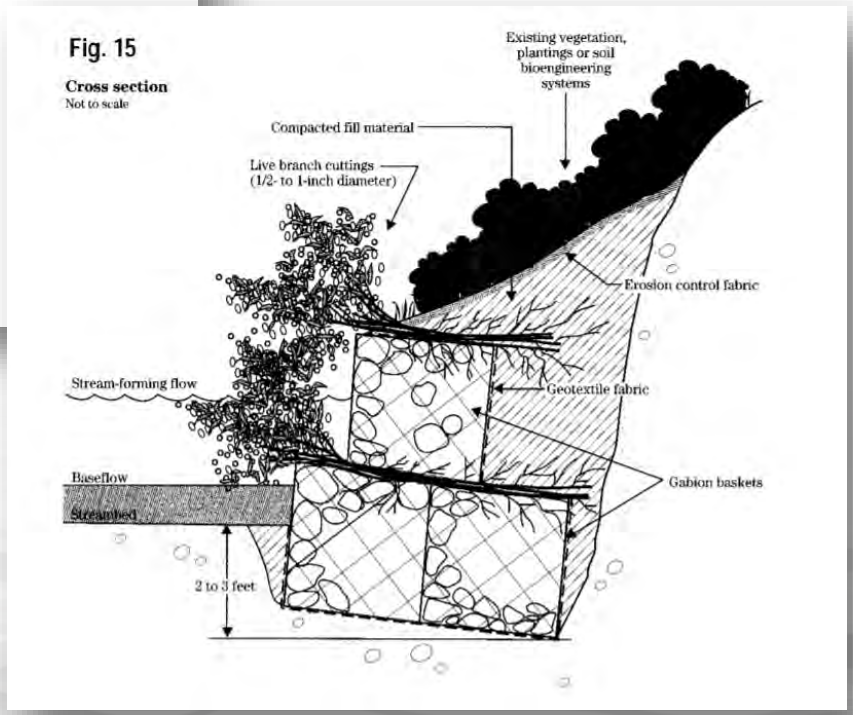
Stream Stabilization Practices

BANK ARMORING/PROTECTION



Rock Armoring

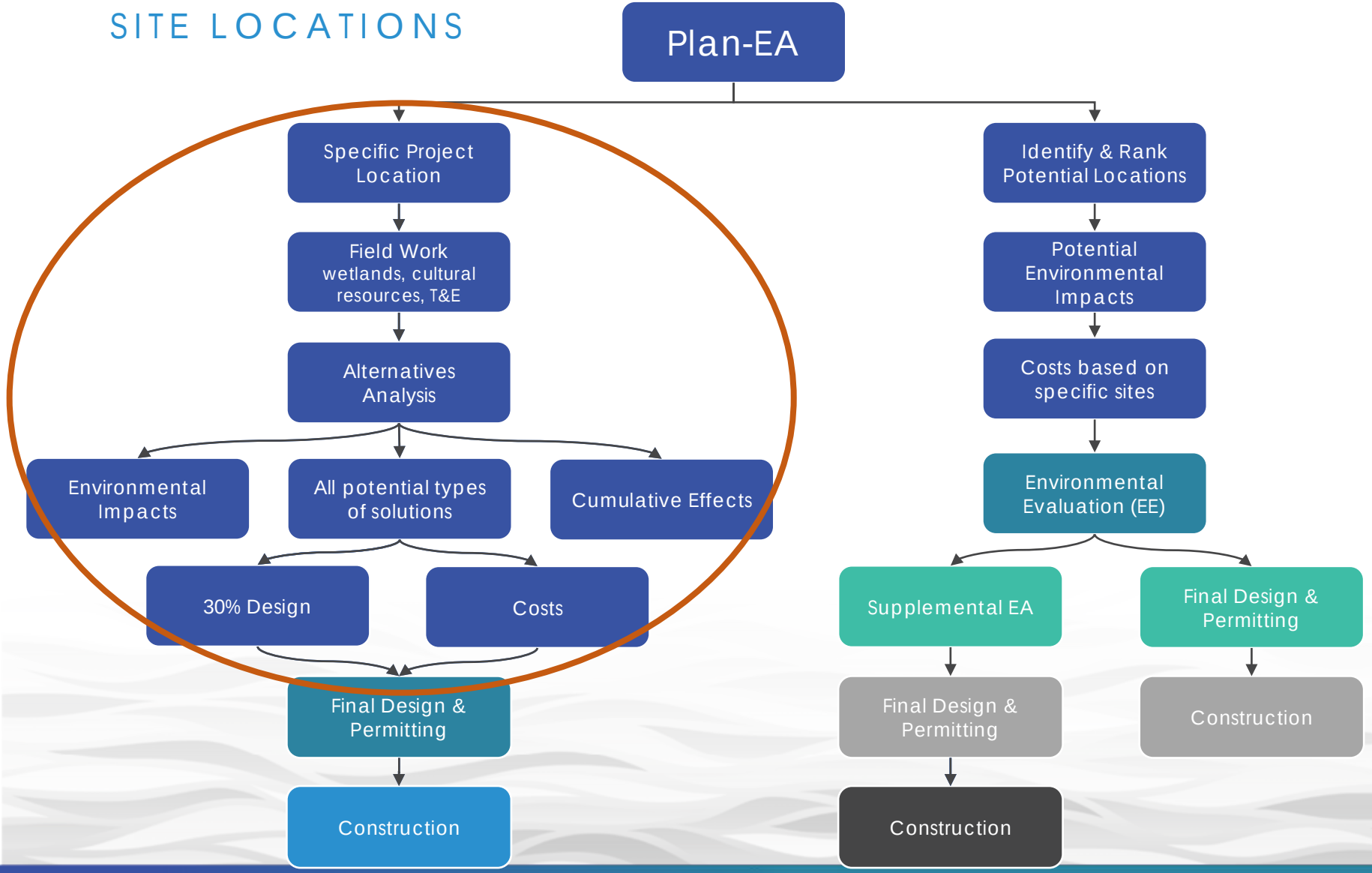
Rock Gabions



Current Phase

Potential Alternatives

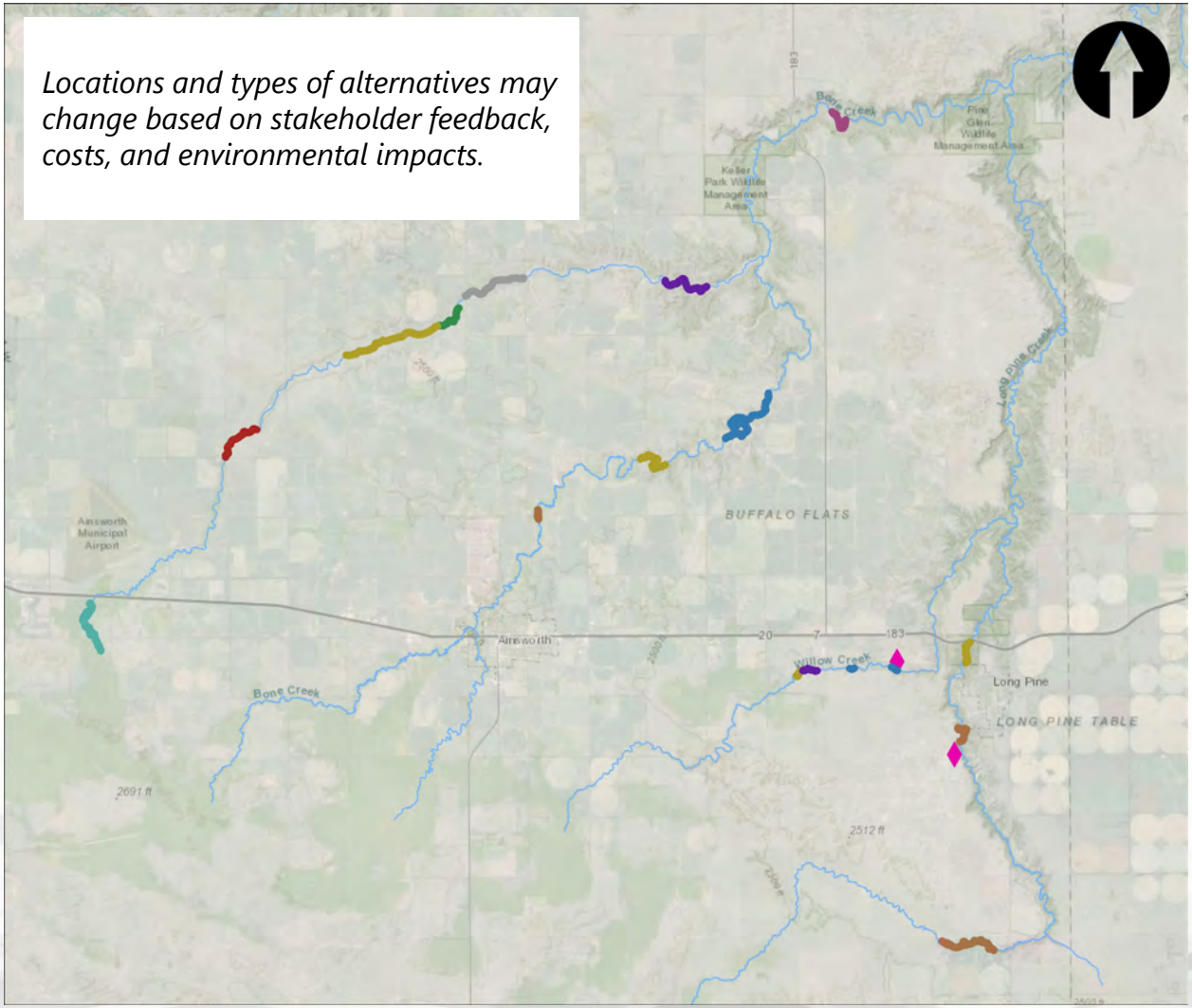
SITE LOCATIONS



Potential Alternatives

POTENTIAL PROJECT TYPES BY REACH

Locations and types of alternatives may change based on stakeholder feedback, costs, and environmental impacts.

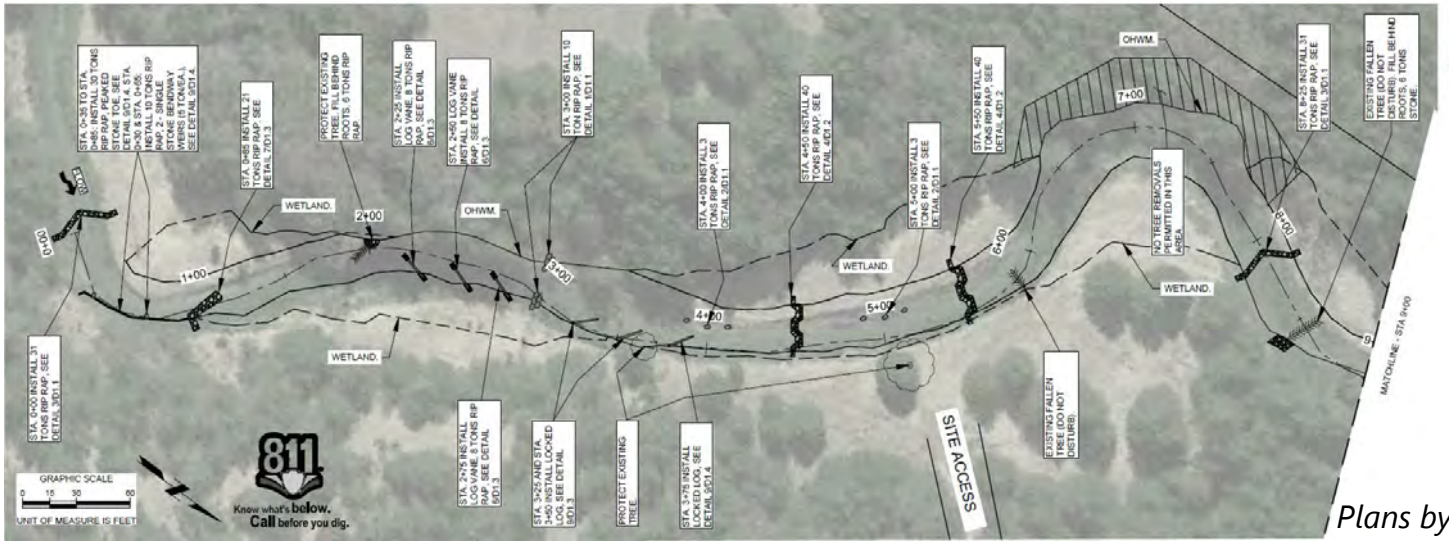


Potential Alternative

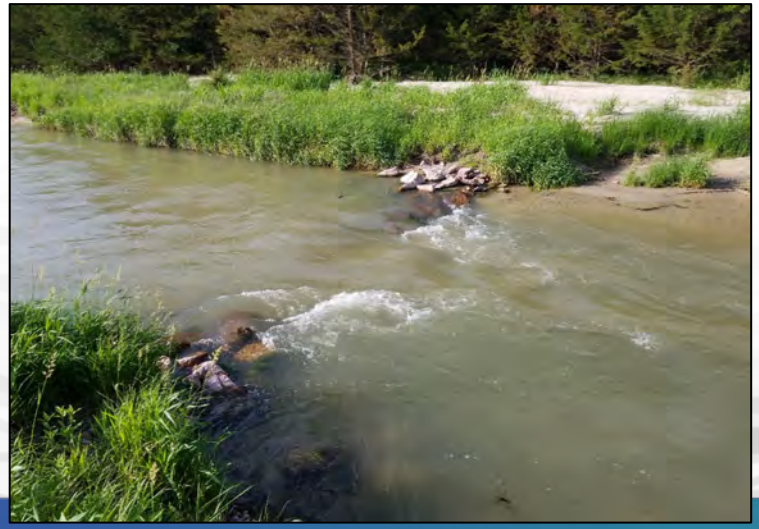
- Aggrading Sills
- Check Dam / Low Crossing
- Check Dam / Natural Channel Design
- Grade Control
- Grade Control / Bank Protection
- Natural Channel Design
- Rock chutes
- Dependent on Old Hwy 7 Design
- Looking into potential solutions
- Watershed BMPs

Potential Alternatives

NATURAL CHANNEL DESIGN

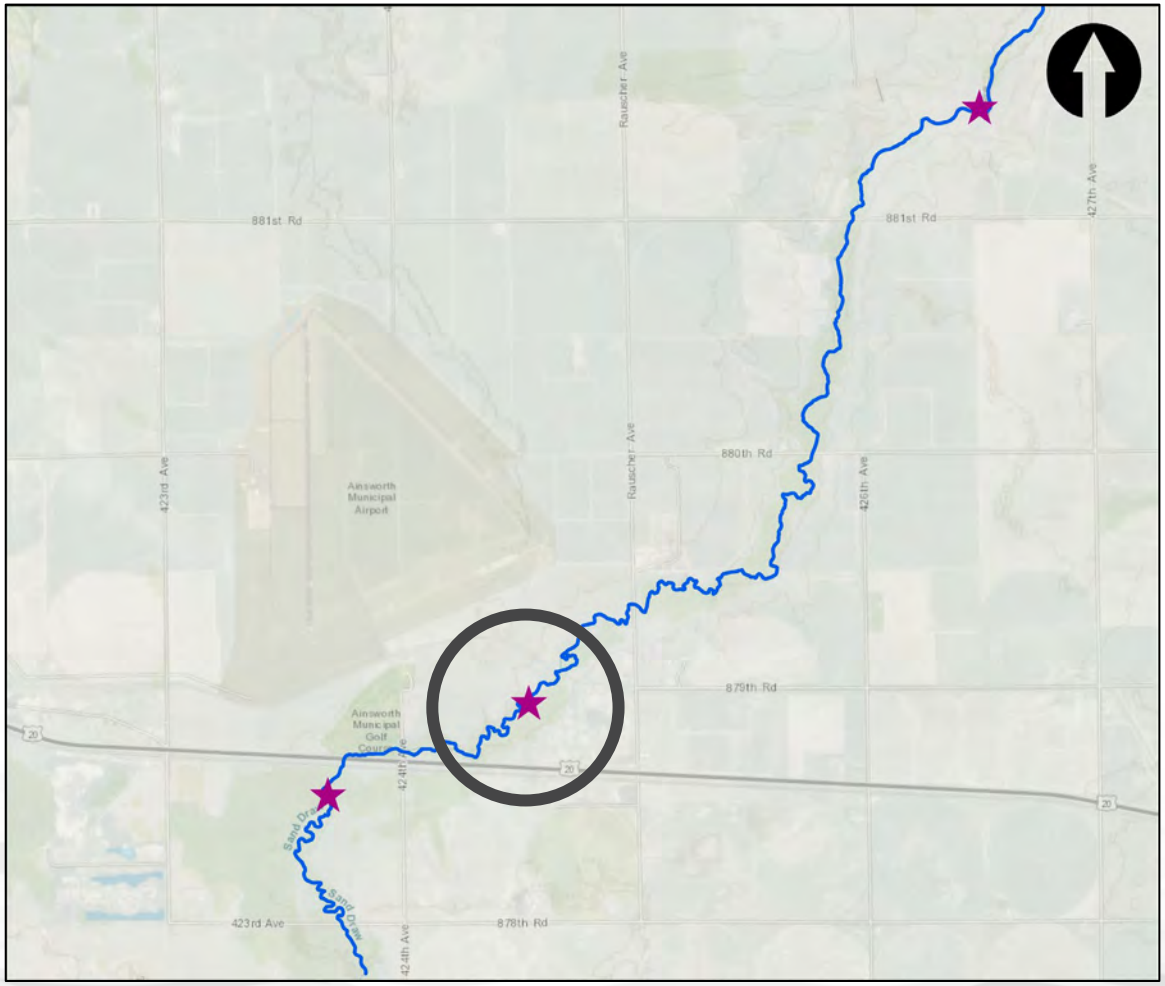


Plans by JEO



Potential Alternatives

SMALL CHECK STRUCTURES WITH FISH PASSAGE



Potential Alternatives

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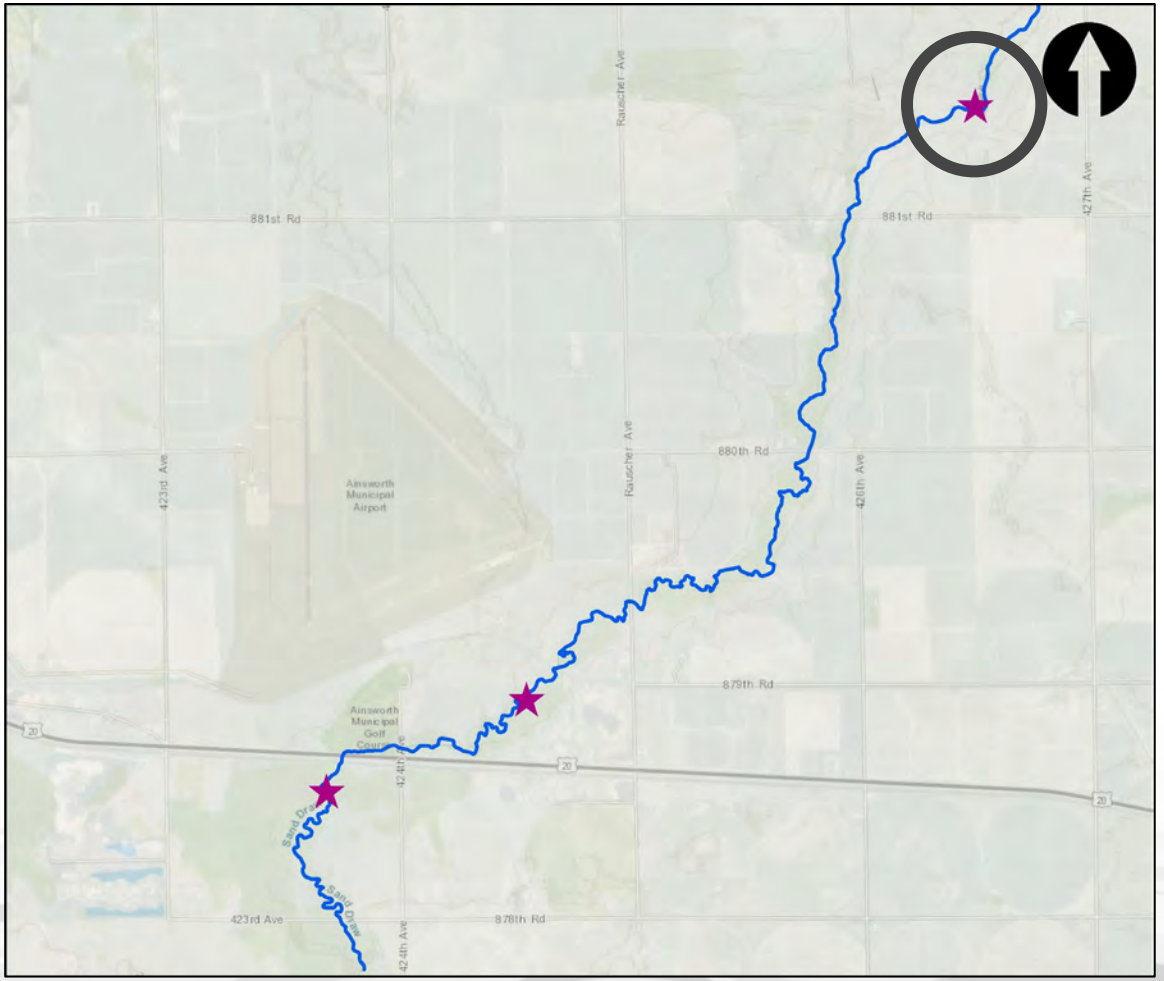

Potential Alternatives

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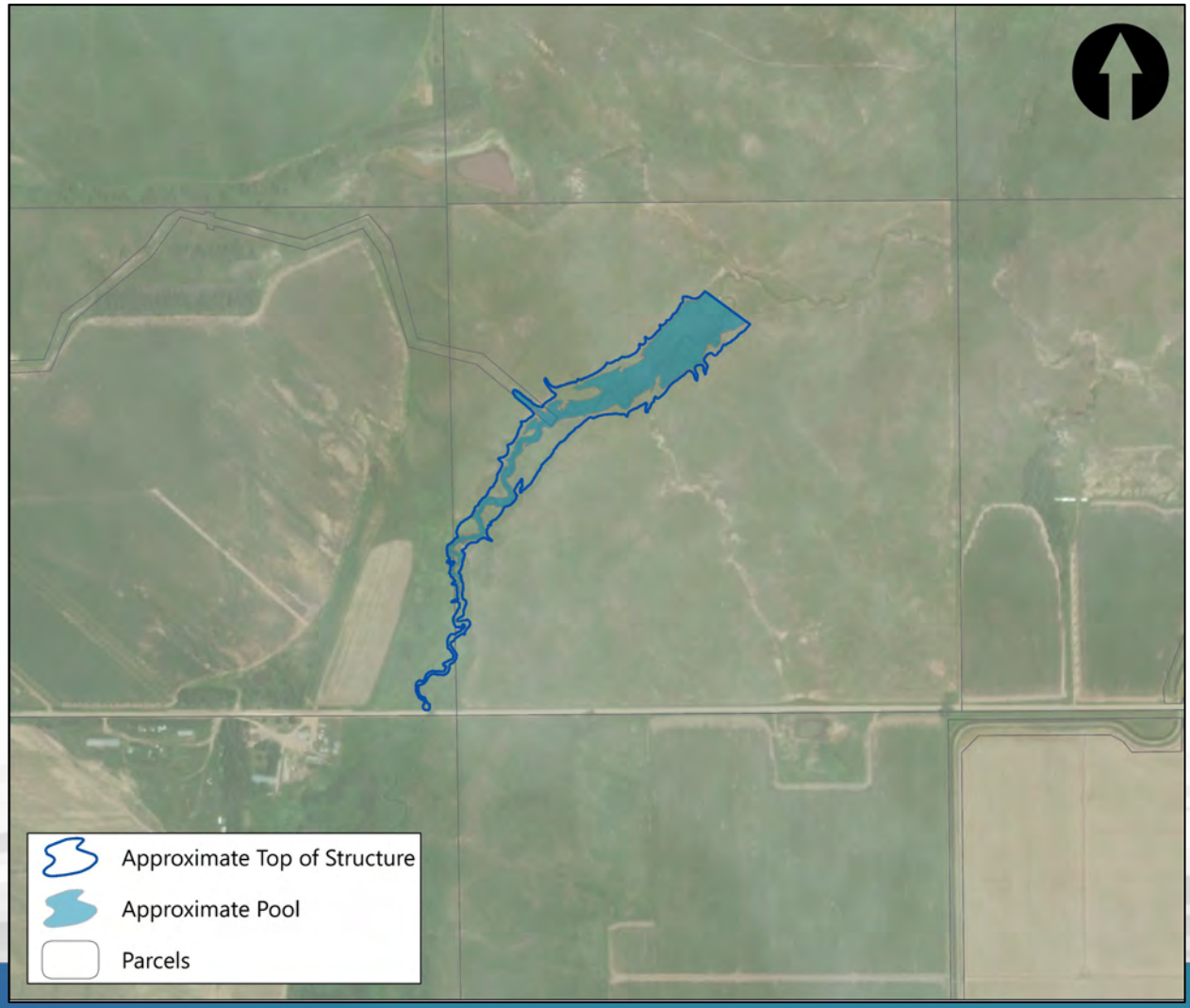
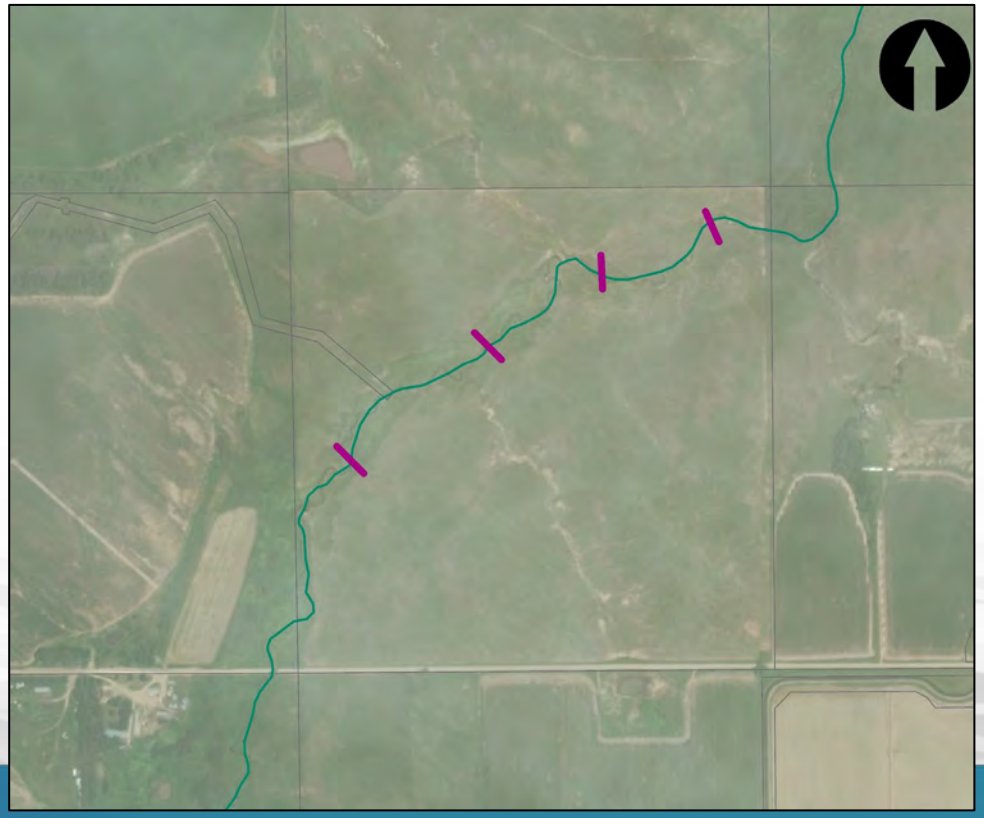


Potential Alternatives

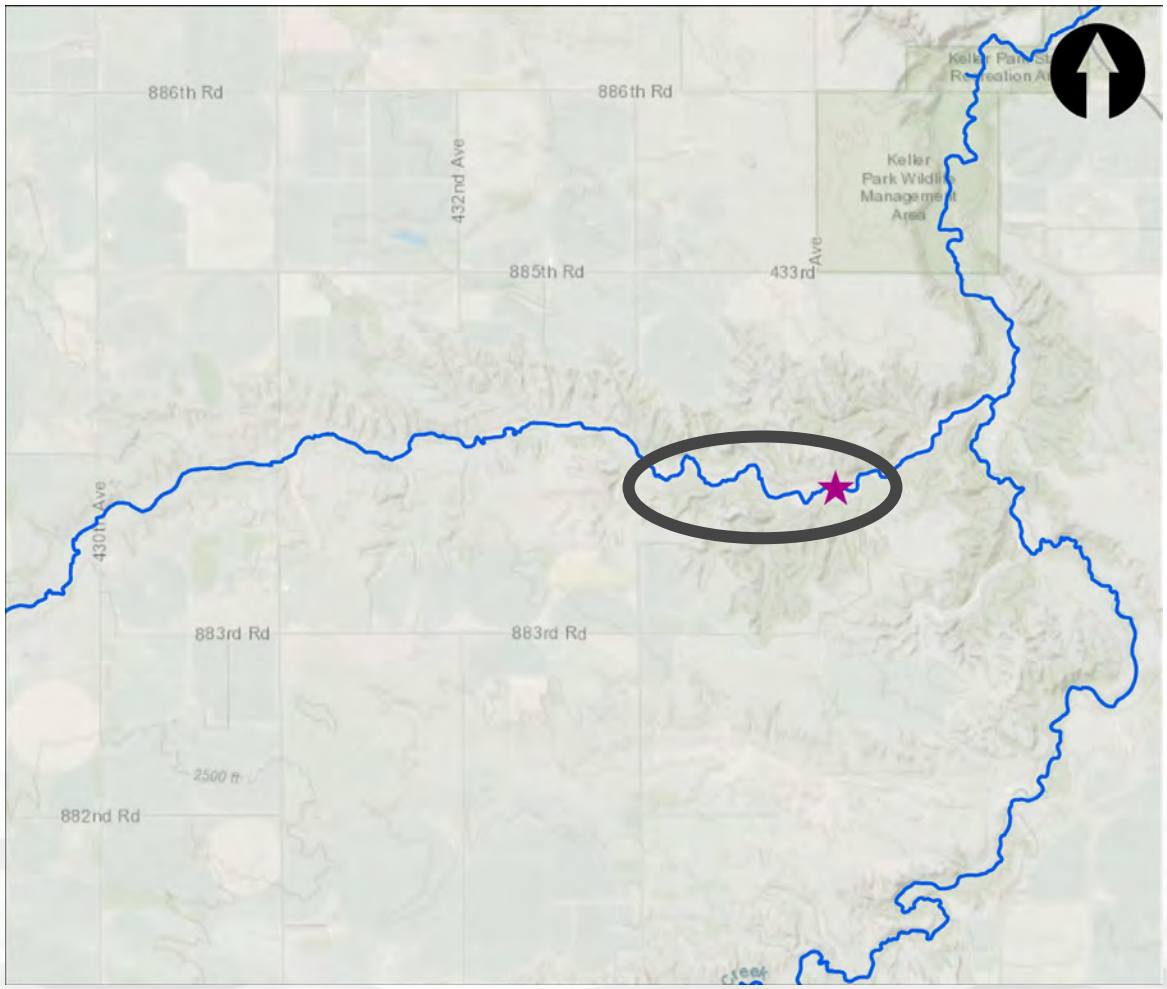
STEP/POOL STRUCTURES

- Series of step/pool structures
- Confined within channel
- Prevent headcut progression from downstream
- Structures would aggrade over time



Potential Alternatives

LARGE STRUCTURAL ALTERNATIVES



Potential Alternatives

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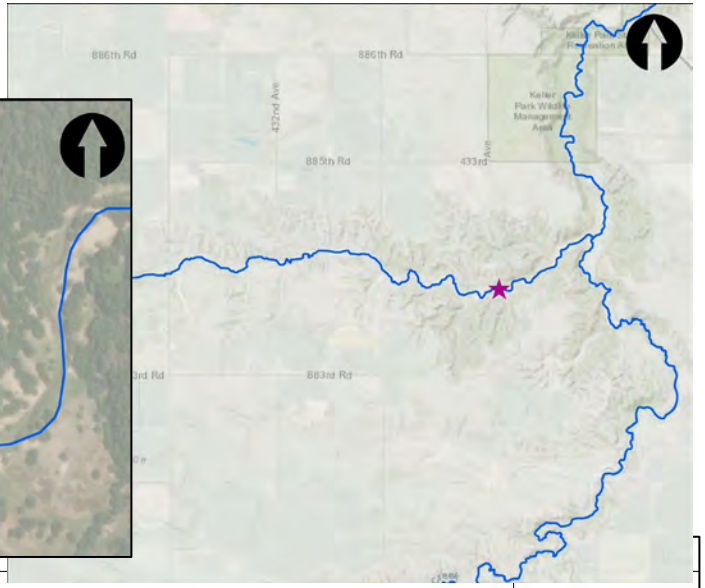
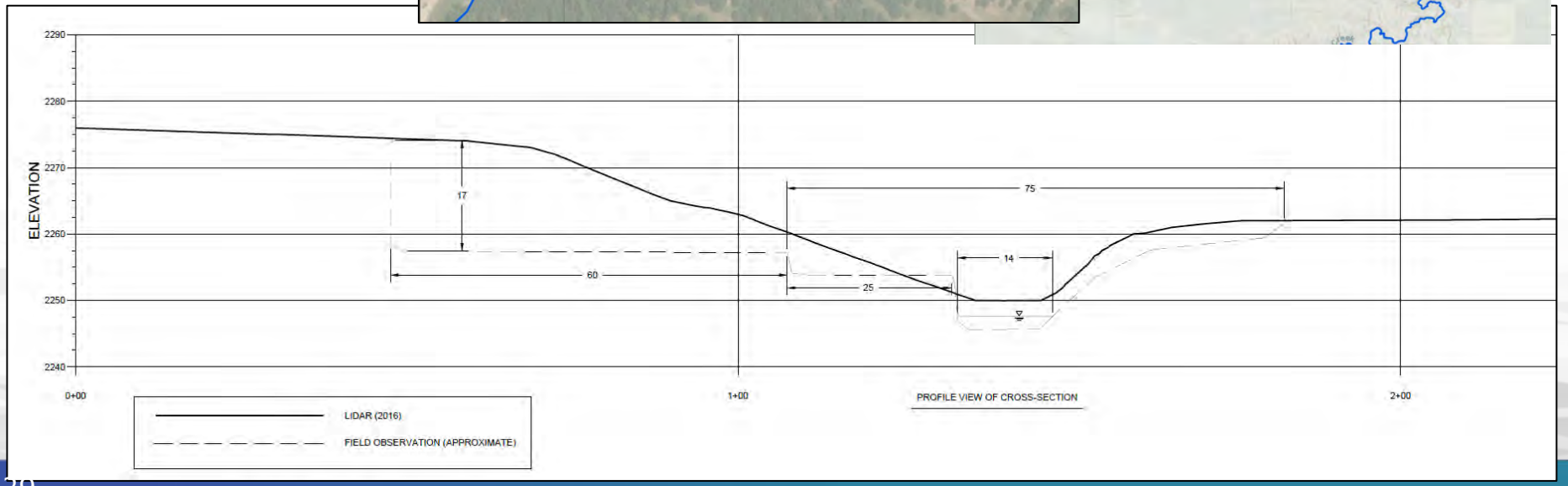
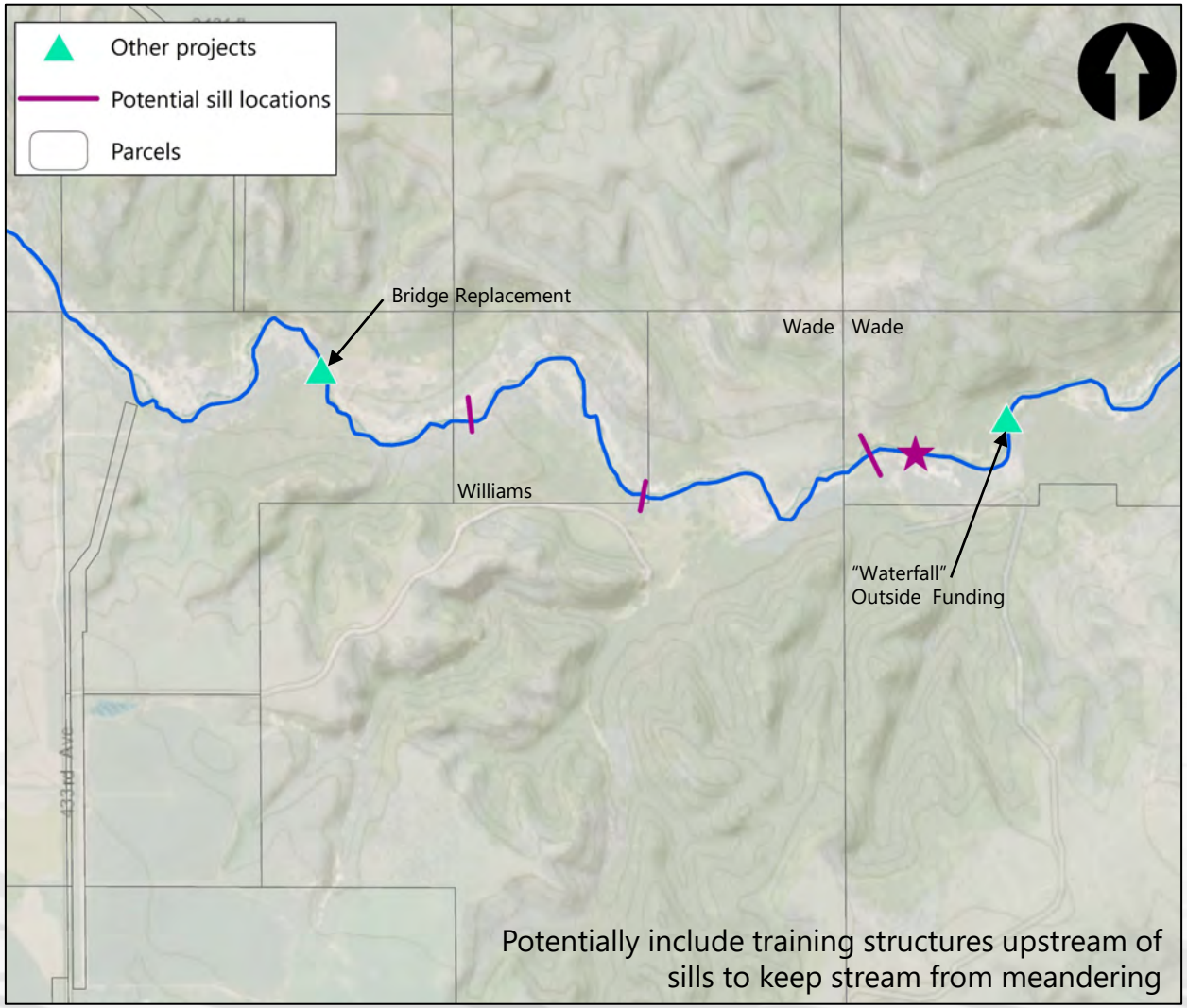




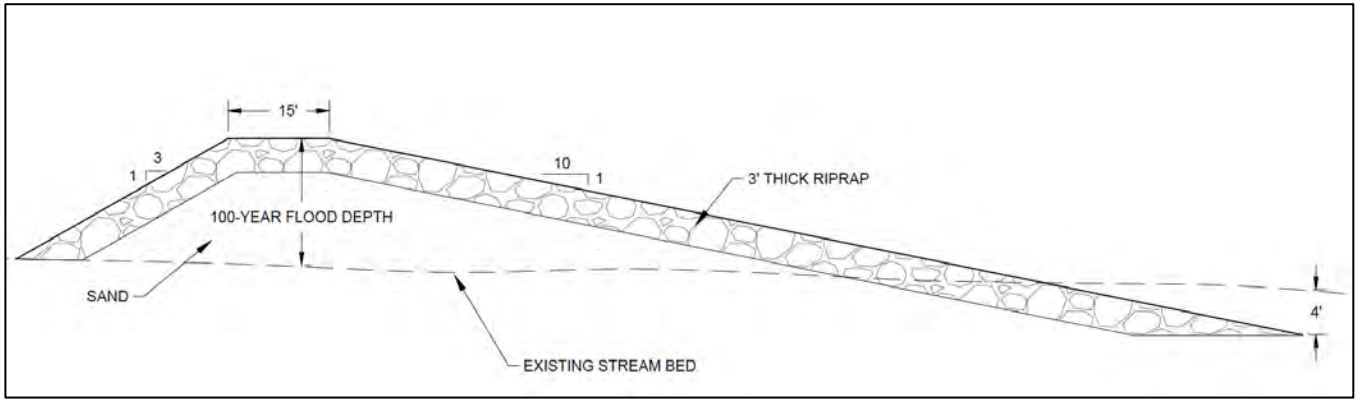
Potential Alternatives

LARGE STRUCTURAL ALTERNATIVES



Potential Alternatives

LARGE STRUCTURAL ALTERNATIVES

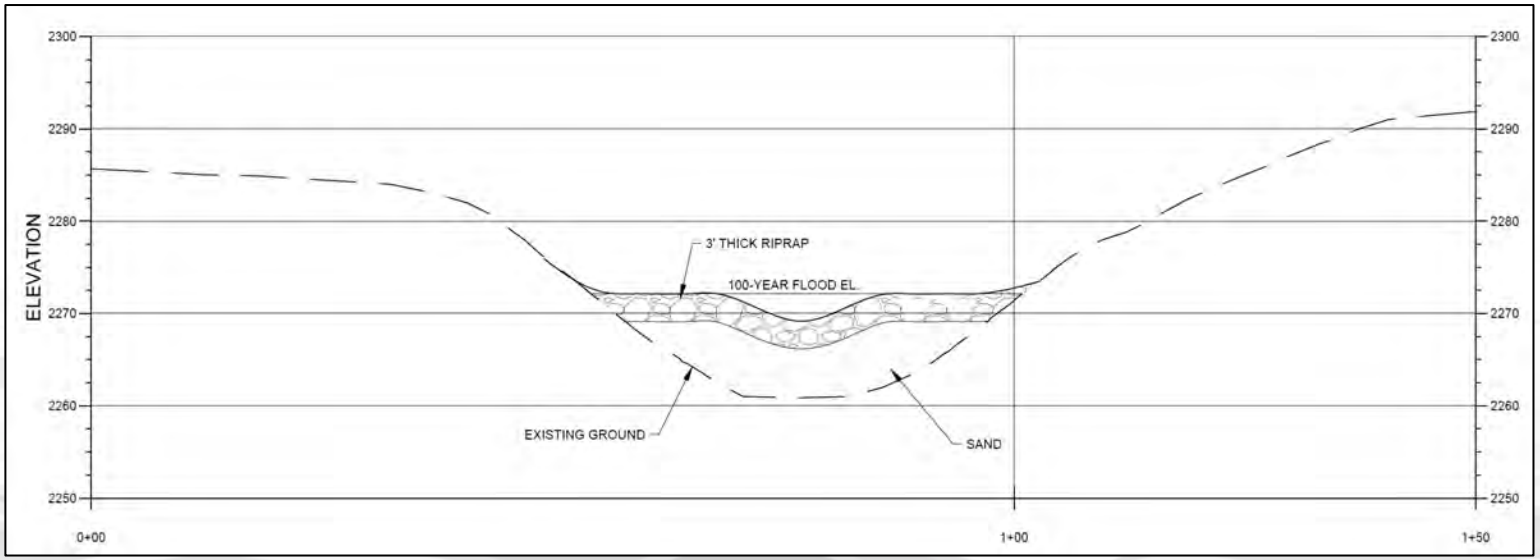


Approximate cost per structure:

$200,000

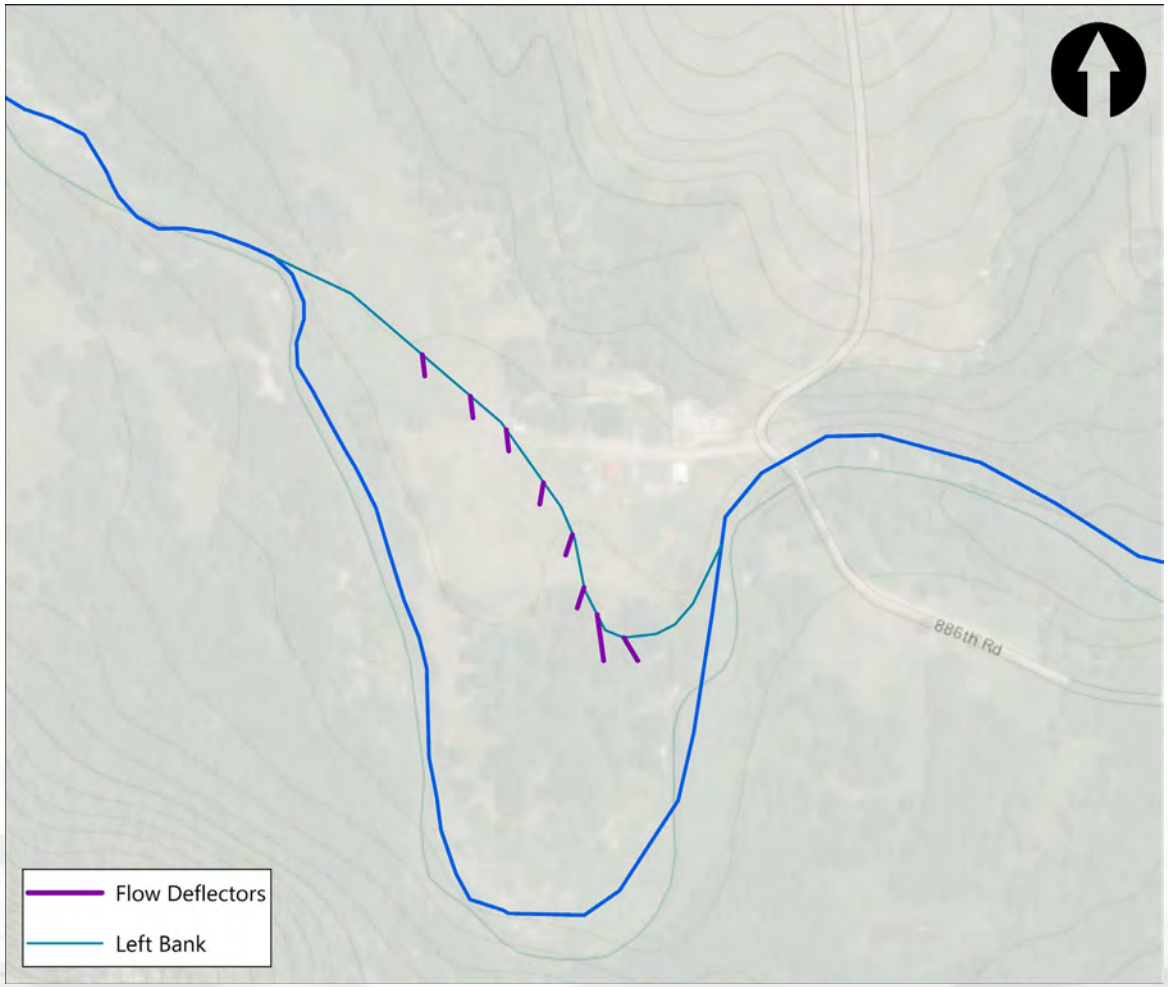
Approximate construction cost for this alternative:

$600,000



Potential Alternatives

LARGE STRUCTURAL ALTERNATIVES



Potential Alternatives

HIDDEN PARADISE

- **Water Quality**
  - Ongoing monitoring through NDEE
  - Excess sediment in system
- **Flooding**
  - Limited space to work
  - Expensive and complicated solutions
  - Analysis ongoing

Potential Alternatives

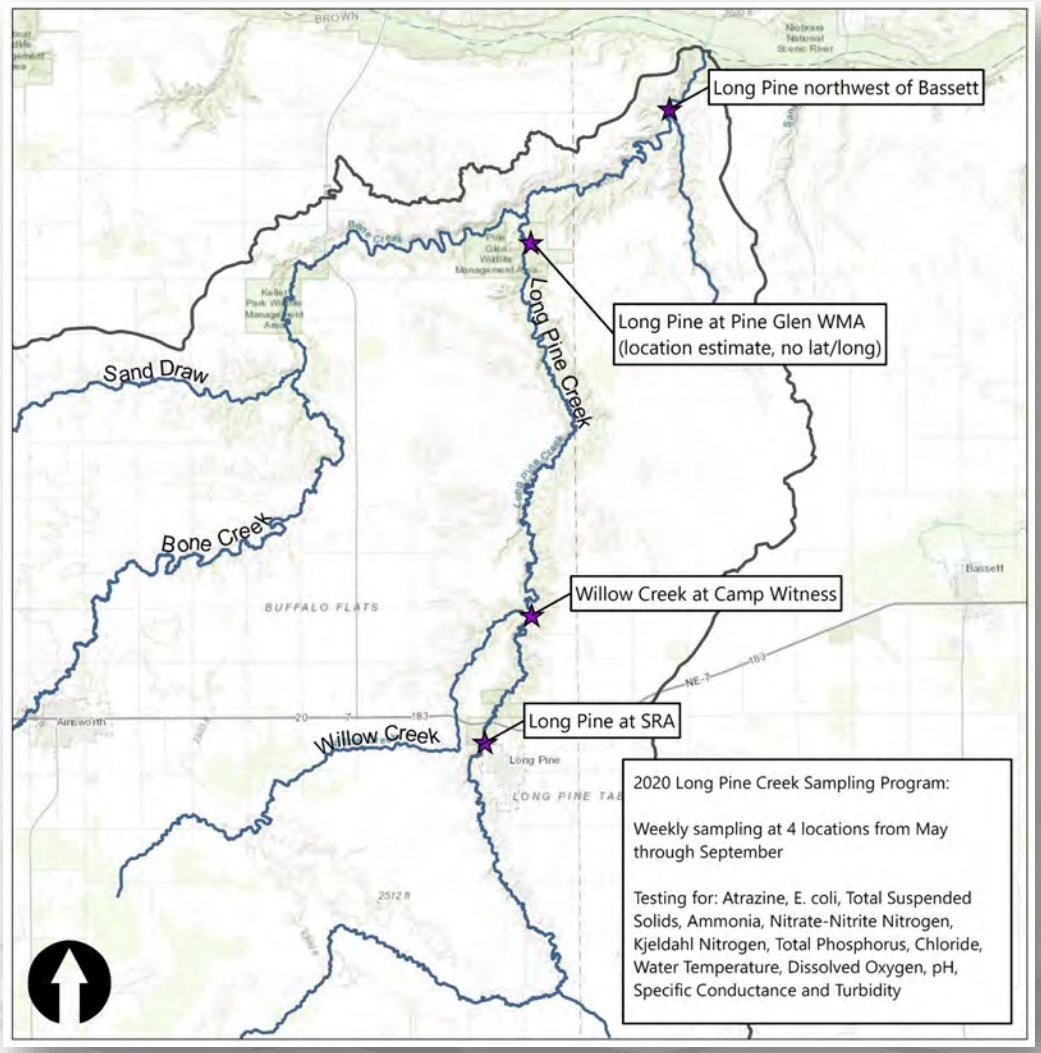
WATERSHED BMPS

- **Conservation Practices**
  - Grade stabilization on draws
  - Tree/debris clearing
  - Riparian buffers

- **Utilizing 319 Funds**

Water Quality Monitoring

NEBRASKA DEPT. OF ENVIRONTMENT & ENERGY (319)



Water Quality Monitoring

NEBRASKA DEPT. OF ENVIRONTMENT & ENERGY (319)

Long Pine Creek Sampling Data Monthly Averages

		Escherichia coli (colonies/100mL)		Total suspended solids (mg/L)		Nitrate + Nitrite (mg/L)		Phosphate - Phosphorus (mg/L)	
		2020	2009-2018	2020	2009-2018	2020	2009-2018	2020	2009-2019
Long Pine SRA	May	510	188	89.4	14.4	1.00	1.48	0.57	0.20
	June	1,986	835	41.0	15.9	1.45	1.46	0.34	0.21
	July	---	292	---	14.1	---	1.47	---	0.19
	August	---	181	---	10.6	---	1.41	---	0.23
	September	---	92	---	19.3	---	1.52	---	0.18
Long Pine at Riverview	May	1,823	---	431.3	---	1.39	---	0.69	---
	June	517	---	97.5	---	2.09	---	0.41	---
	July		---	---	---		---	---	---
	August		---	---	---		---	---	---
	September		---	---	---		---	---	---
Long Pine at Pine Glen	May	998	---	272.5	---	1.19	---	0.51	---
	June	308	---	110.0	---	1.79	---	0.33	---
	July	---	---	---	---	---	---	---	---
	August	---	---	---	---	---	---	---	---
	September	---	---	---	---	---	---	---	---
Willow Creek at Camp Witness	May	1,632	---	239.9	---	0.57	---	0.47	---
	June	1,120	---	136.0	---	1.55	---	0.77	---
	July	---	---	---	---	---	---	---	---
	August	---	---	---	---	---	---	---	---
	September	---	---	---	---	---	---	---	---

NOTES

- Sample concentrations will vary with stream flow rates (recent rain events) and may increase during periods of high flow
- Stream flow rates are not available at this time
- When stream flow rates are released, the time series plot for the SRA site will be updated to determine if concentrations are trending upward, or if elevated readings are a function of high flows

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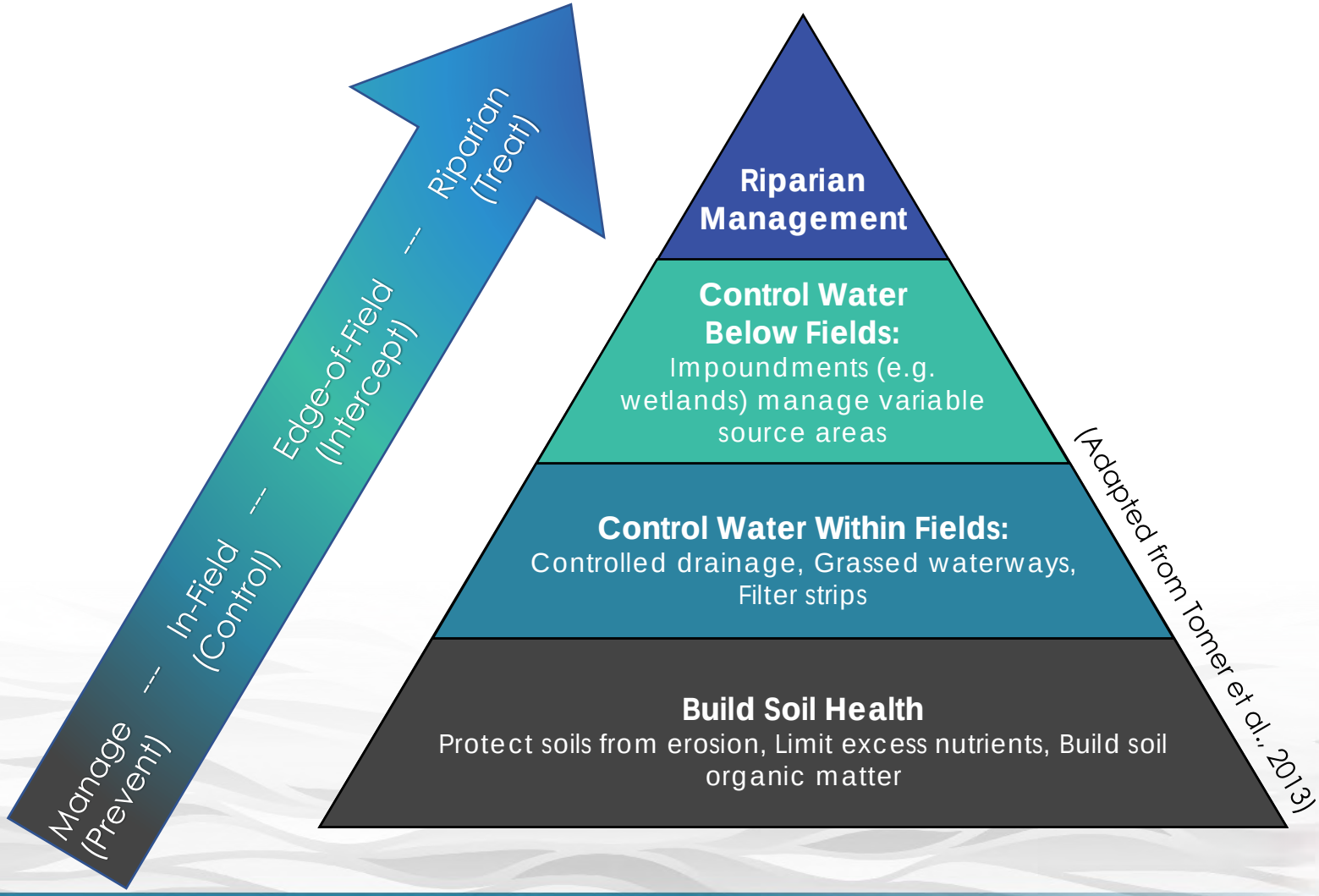
Water Quality Improvement

AG CONSERVATION PRACTICES



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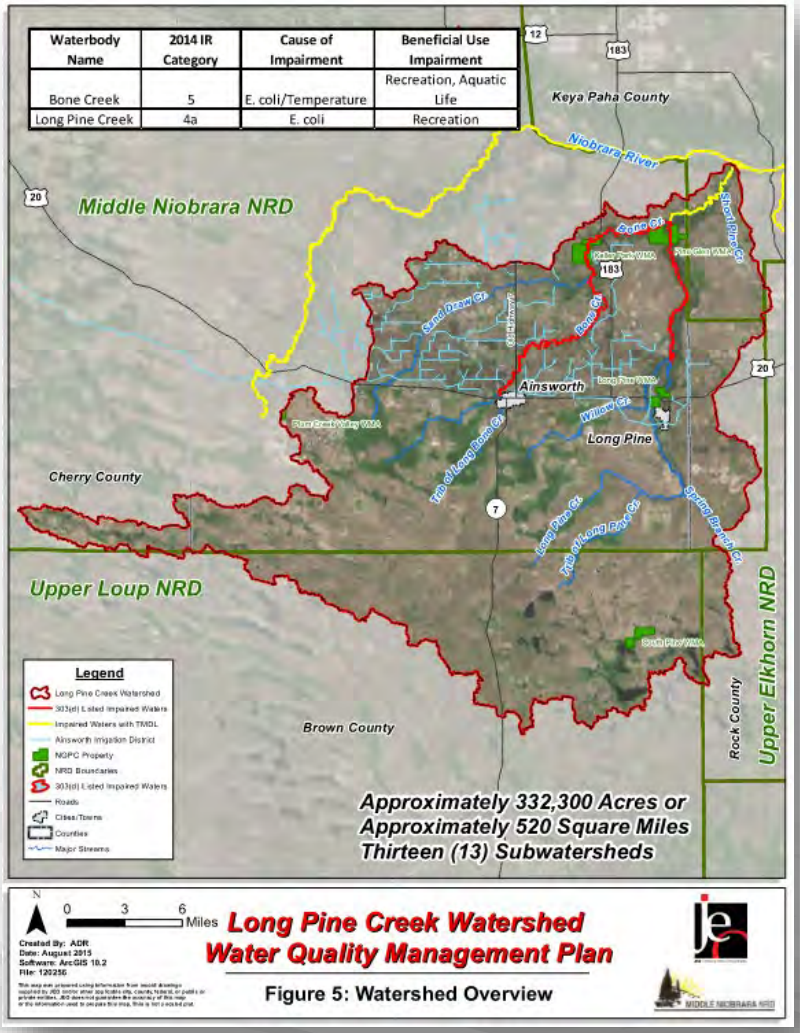
Water Quality Improvement

IMPAIRMENTS AND KEY SPECIES



Water Body Name	Waterbody ID	State Resource Water	USE CLASSIFICATION: Primary Contact Recreation	Aquatic Life: Coldwater	Aquatic Life: Warmwater	Water Supply: Public Drinking Water	Water Supply: Agriculture	Water Supply: Industrial	Aesthetics	Recreation	Nutrient Classification	2014 IR Category	Key Species
Sand Draw	NI3-12221		X	B			A		X			3	Northern redbelly dace, Pearl dace, Finescale dace, Bluegill
Bone Creek	NI3-12230			B			A		X			3	
Bone Creek	NI3-12220		X	B			A		X			5	Brook Stickleback
Long Pine Creek	NI3-12200		X	B			A		X			4A	Brown trout, Rainbow trout, Channel catfish
Long Pine Creek	NI3-12300	B	X	A			A		X			3	Brook Stickleback, Brown trout, Rainbow trout
Long Pine Creek	NI3-12400	B	X	A			A		X			5	Brook Stickleback, Brown trout, Rainbow trout
Willow Creek	NI3-12310			B			A		X			2	
Short Pine Creek	NI3-12210			A			A		X			2	Brown trout, Rainbow trout, Channel catfish
Unnamed	NI3-12222			B			A		X			3	
Keller Park Lake #1 (SRA)	NI3-L0020				A		A		X	X	W	3	
Keller Park Lake #2 (SRA)	NI3-L0030				A		A		X	X	W	2	
Keller Park Lake #3 (SRA)	NI3-L0040				A		A		X	X	W	3	
Keller Park Lake #4 (SRA)	NI30L0050				A		A		X	X	W	3	
Keller Park Lake #5 (SRA)	NI3-L0060			B			A		X	X	W	3	
Williams Pond	NI3-L0080				A		A		X	X	W	3	

Water Quality Improvement

PRIORITY BMPS & IMPLEMENTATION

Table 30: Priority BMPs for the Long Pine Creek Watershed

BMP Type	ACT Category		
	Avoid	Control	Trap
Non-Structural			
Pet Waste Ordinance	X		
Onsite Wastewater Treatment System Education and Outreach		X	
Irrigation Water Management*	X	X	
Fertilizer/Nutrient Management*	X	X	
Cover Crops*	X	X	X
Structural			
Riparian Fencing and Alternative Water Sources	X		
AFO Waste Control	X	X	
Stream Stabilization		X	
Filter Strips		X	X
Detention Basins			X

**Additional benefits for groundwater nutrient load*

Source: Long Pine Creek WQMP, JEO Consulting Group

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Water Quality Improvement

PRIORITY BMPS & IMPLEMENTATION

Table 34: Implementation Schedule of Management Actions

Activity/BMP to Install, Develop, or Implement	2016 - 2020	2021 - 2025	2026 - 2030	2031 - 2035	2036 - 2040	Total
Work with NRCS to designate priority watersheds/ areas for EQIP program	X	X	X	X	X	--
Riparian Fencing (miles)	30	15	5	5	5	60
Alternative Livestock Water Sources (units)	100	100	75	75	50	400
Stream Restoration (miles)	15	15	10	10	4	54
Filter Strips (treated acres)	5,000	5,000	2,884	2,882	2,882	18,648
Detention Ponds (units)	30	20	20	15	15	100
Wet Detention Basins (units)	2	2	2	1	1	8
Develop & Implement Pet Waste Ordinances	X	X				--
OWTS Upgrades (each)	12	30	30	12	11	95
Irrigation Management Program (acres)	5,000	10,000	5,000	2000	1310	23,310
Fertilizer/Nutrient Management Program (acres)	6,500	6,500	6,000	5000	3971	27,971
Cover Crop Program (acres)	6,500	6,500	6,000	5000	3971	27,971
NDEQ Rotation Monitoring (2020, 2226, 2032, 2038)	X		X	X	X	--
Additional Monitoring	X	X	X	X	X	--
Watershed Plan Update	X	X	X	X	X	--

Source: Long Pine Creek WQMP, JEO Consulting Group

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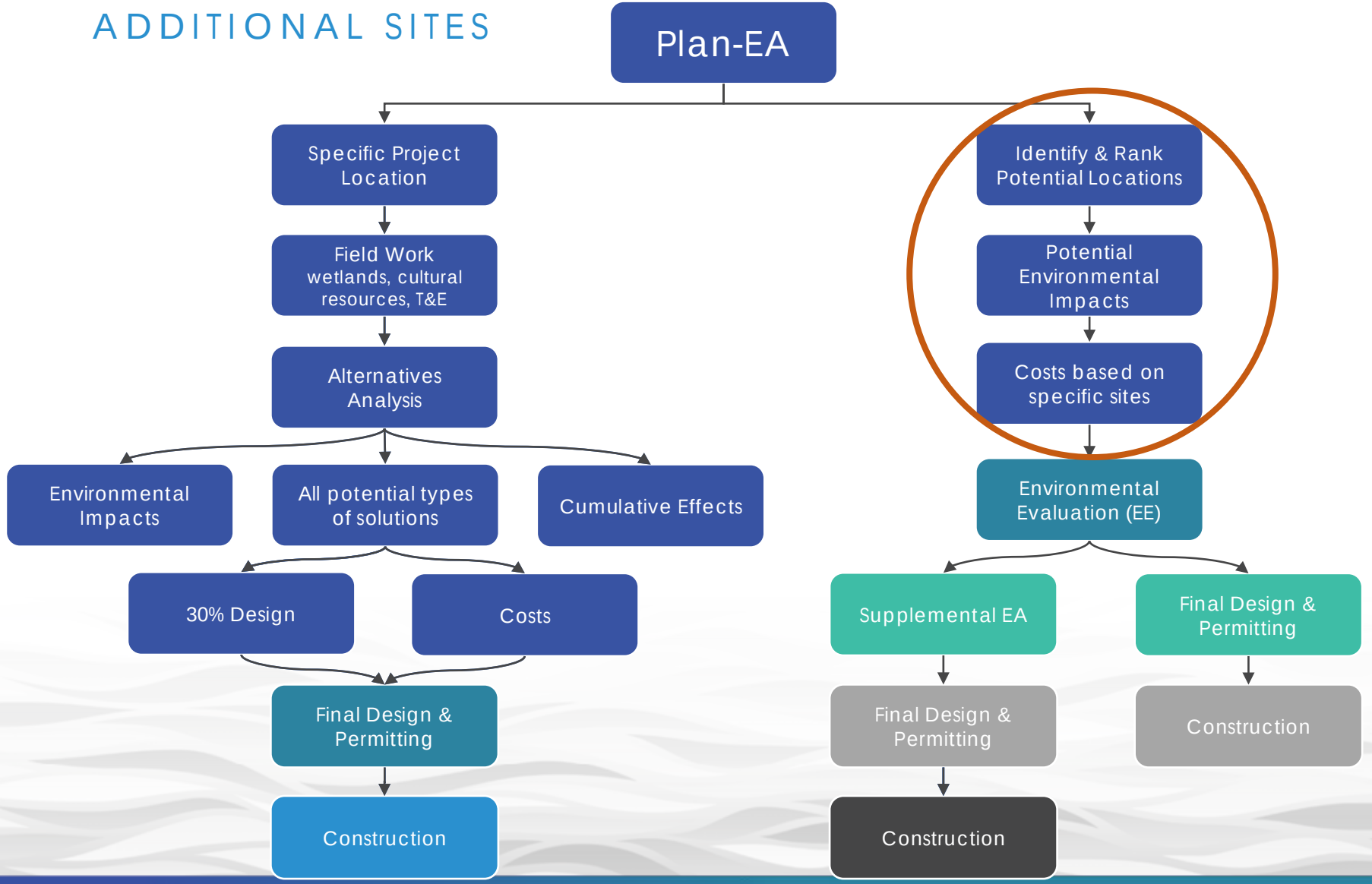
Current Phase

Potential Alternatives

ADDITIONAL SITES



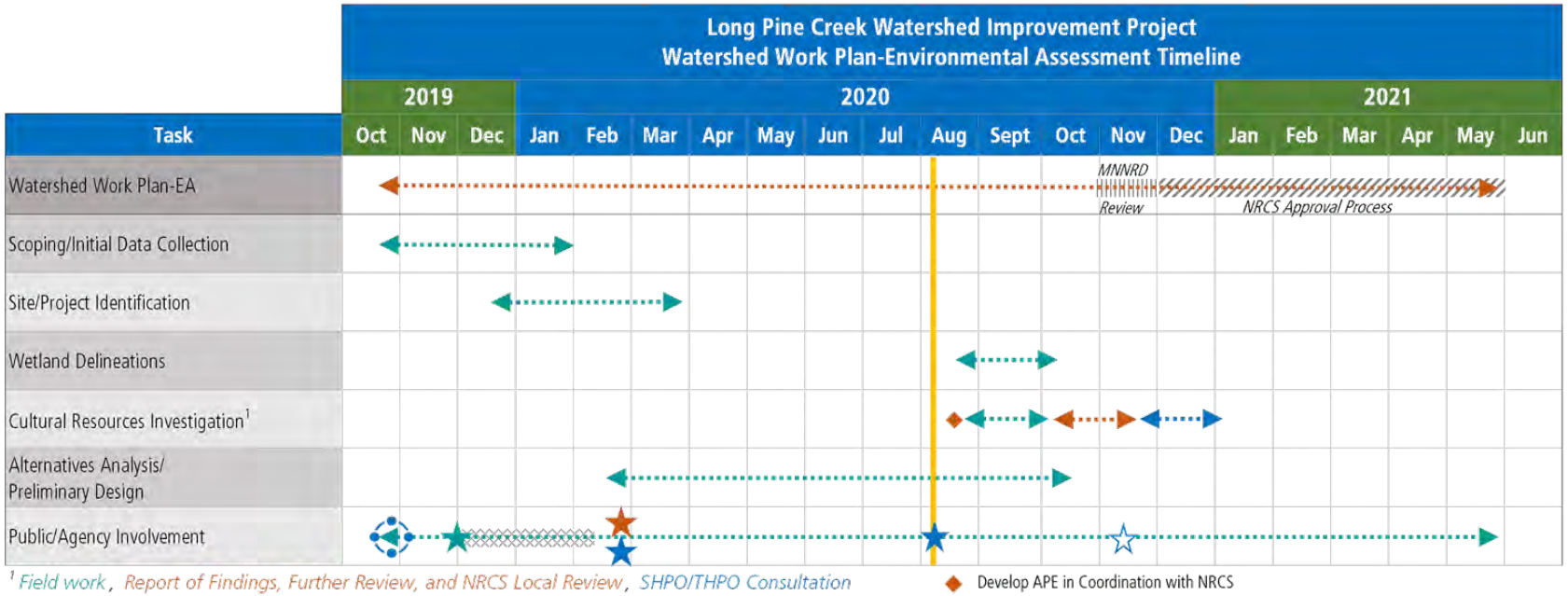
Tiered Sites

SITE RANKING AND IDENTIFICATION

- Stakeholder input
- Previous studies / analyses
- LiDAR and aerial analysis
- Watershed BMPs
- Riparian Improvements

Project Schedule

SCHEDULE



Potential Issues That Can Impact Schedule

- -Significant Cultural Resources found at Site
- -T&E Species: Field Survey Required
- -T&E Species: Likely to Adversely Affect
- -Selected Design/Site not Least Environmentally Damaging Practicable Alternative (LEDPA)

NRCS Approval Process

Dec Jan Feb Mar Apr May

1. State NRCS & USACE (if Cooperating Agency) Review
2. FYRA Team Address Comments
3. NRCS National Water Management Center Review
4. 6 FYRA Team/State NRCS Address Comments
5. Public NEPA Review

Public/Agency Involvement

- Invite USACE to be a Cooperating Agency
- Initial Scoping Meeting
- Public and Agency Scoping Meetings
- Form Watershed/Technical Advisory Committee (W/TAC)
- Public and W/TAC Meetings
- Public, W/TAC, and Agency Meetings

Discussion & Questions

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