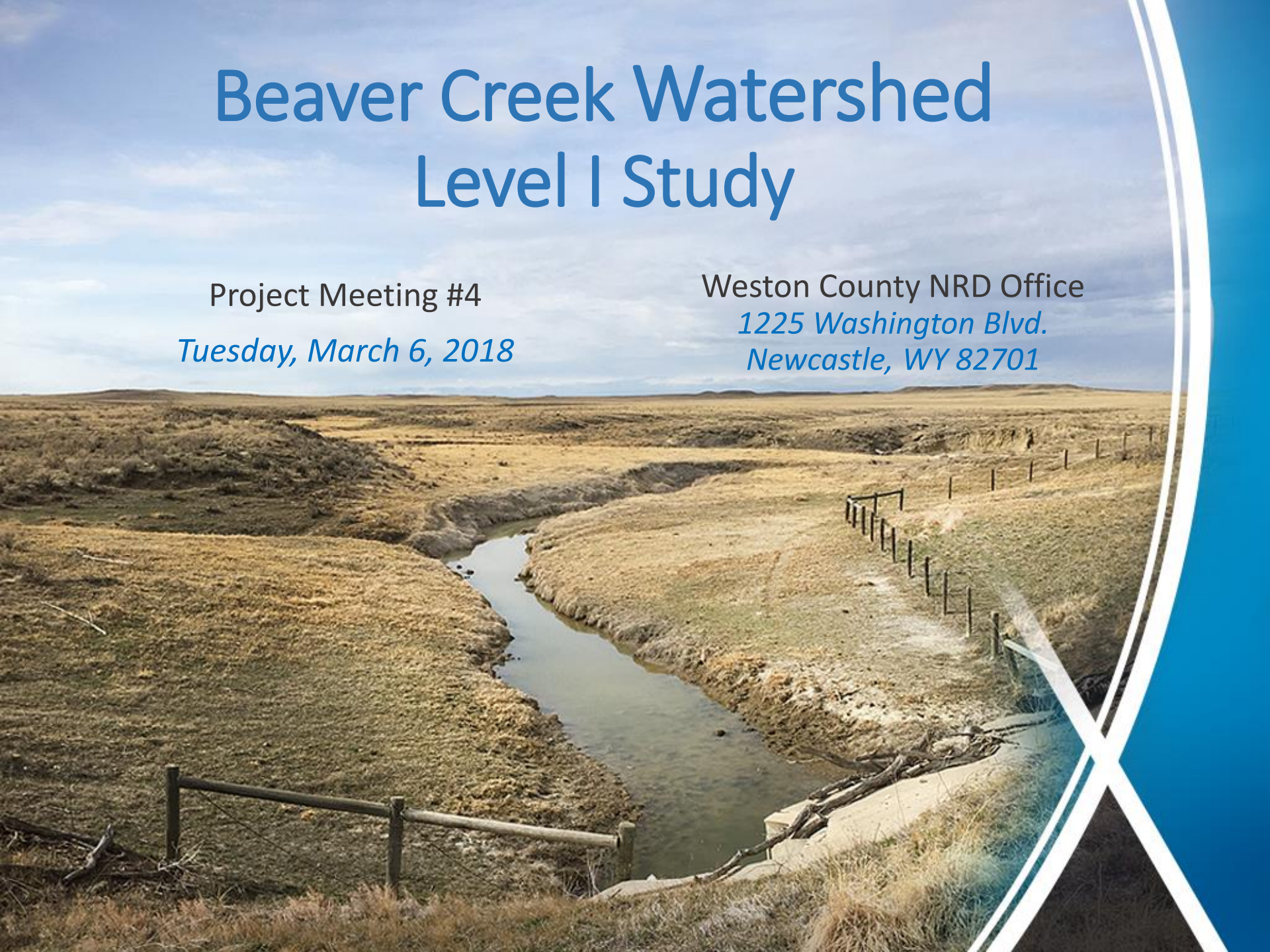


Beaver Creek Watershed Level I Study

Project Meeting #4
Tuesday, March 6, 2018

Weston County NRD Office
*1225 Washington Blvd.
Newcastle, WY 82701*



WELCOME!!!

Watershed Meeting Topics

- Brief Watershed Study Introduction
 - Current Status
 - Geomorphology – Stream Classification results
 - What's next?
-
- Wrap up
 - Question/Answer and Open House Style

What is a watershed study?



The objective of a Watershed Study is to

- *Evaluate an individual watershed's existing conditions*

And from collaboration with landowners, stakeholders, and public outreach

- *Develop a Watershed Management and Rehabilitation Plan*
- *To identify projects that are eligible for funding that may improve or maintain watershed function and systems*

Who is completing the study?

- Wyoming Water Development Office
 - *Funding and Project Management*
- Weston County Natural Resource District
 - *Project Sponsor*
- Olsson Associates and Steady Stream Hydrology
 - *Engineering Support*

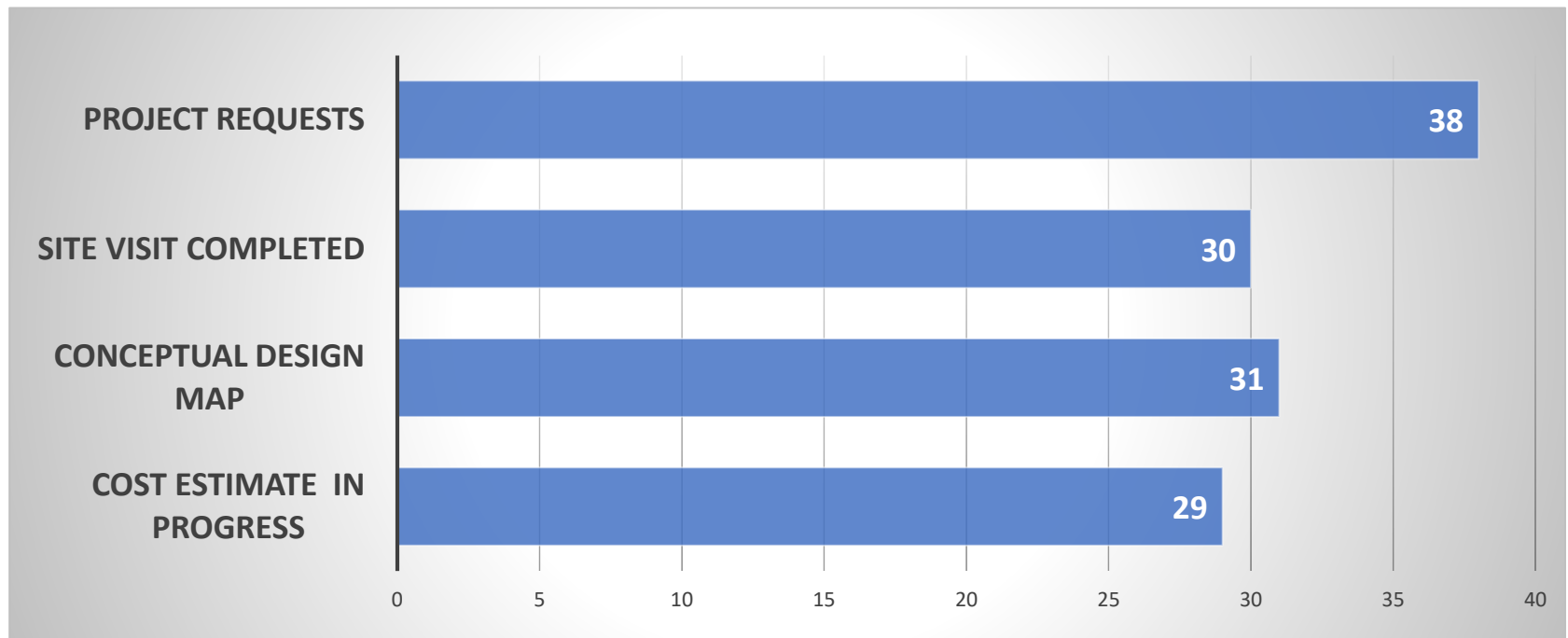


Holistic Approach to Watershed Management

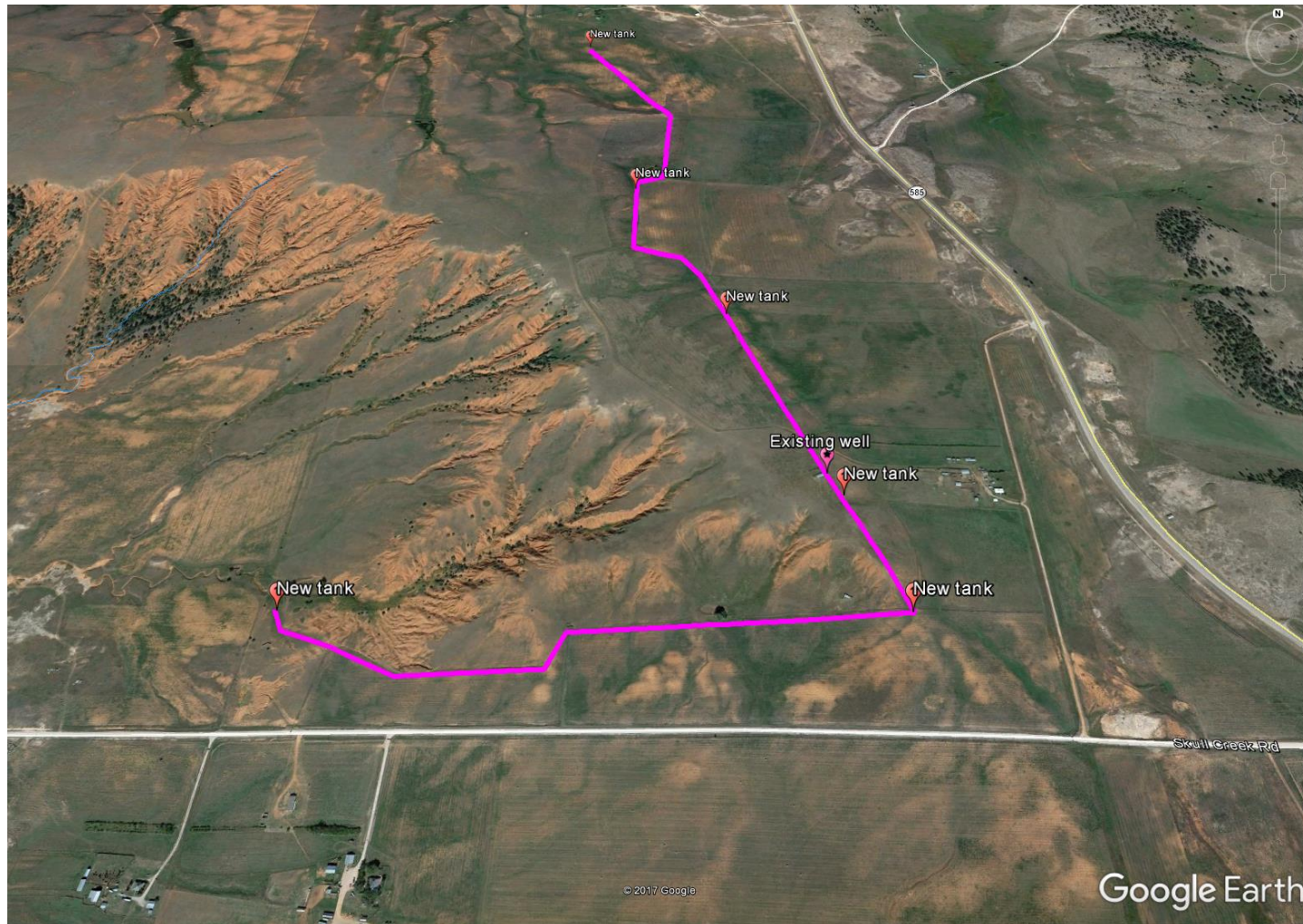
- Collect watershed information
- Document and map conditions
- Identify improvements
- Develop costs and funding options



Current Tally of Project Evaluations



Site Visit and Conceptual Designs – Thirty Completed Fall 2017

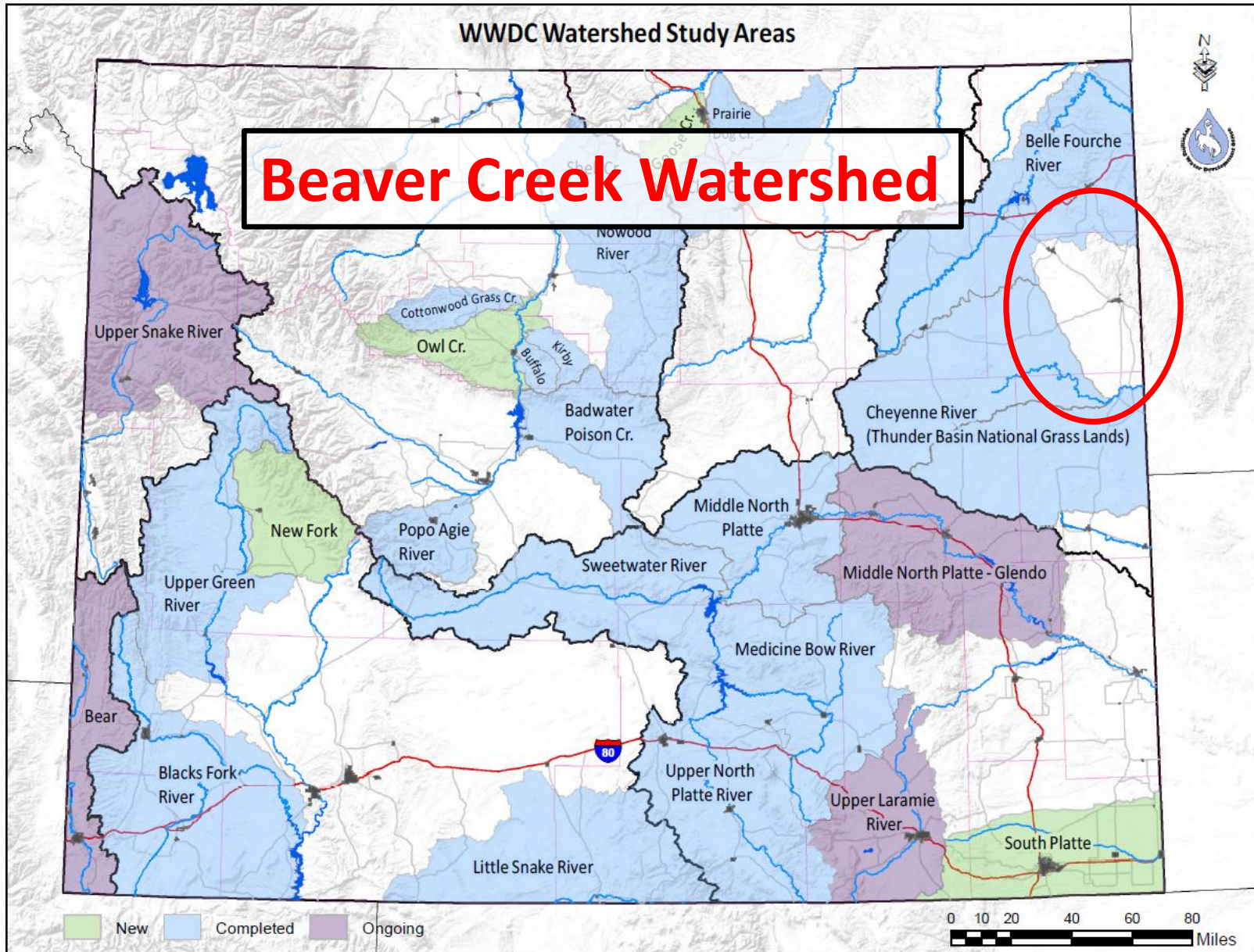


Cost Estimates – In Progress

ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL
Hay Field Irrigation				
Irrigation Pivot (approx 1000' radius)	LS			\$-
Level Field Ditches	LF	6000		
Pipeline and Stock tanks				
1.5" pipeline	LF	1500	\$3.00	\$ 4,500.00
Bore 1.5" pipeline under highway	LF	100	\$45.00	\$ 4,500.00
Stock Tank	EA	1	\$1,000.00	\$ 1,000.00
Blacktail Creek Headgate/ pond?				
			SUBTOTAL	\$ 10,000.00
			15% CONTINGENCIES	\$ 1,500.00
			TOTAL	\$ 11,500.00

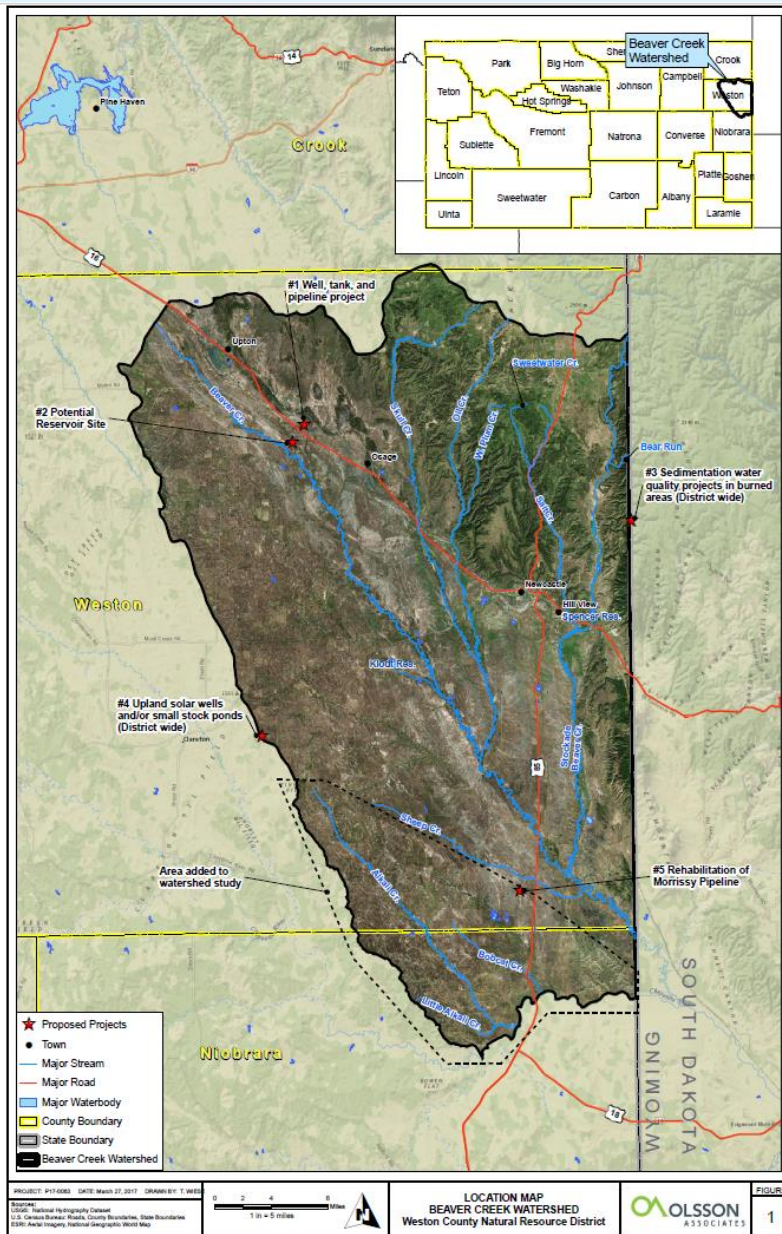
WWDC Watershed Study Areas

Beaver Creek Watershed



760,029 AC

- Beaver
- Stockade Beaver
- Parmalee
- Bear
- Salt
- Sweetwater
- Freshwater
- Oil
- West Plum
- Skull
- Sheep Creek



Parameters:

1) Map and identify the origin and character of landforms

- Overlay the drainage systems of interest
- Locate the terrace elevations to differentiate Pleistocene, Holocene, and Modern depositional features

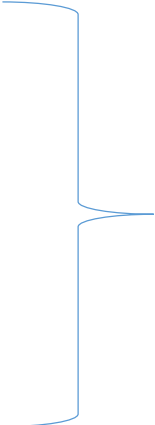
2) Overlay the river system on the fluvial landscape to get the following:

- General channel slope (steep/flat)
- Channel bed features (step/pool or riffle/pool)
- Estimate of channel shape (general width/depth ratios categories <12, 12-40, >40)
- Pattern and profile to show floodplain extent
- Plan view pattern (single or multiple channels)
- Confinement (entrenchment slight, moderate, entrenched) or lateral containment (yes or no)

3) Delineation of Valley Types and Landforms

- Landforms (alluvial fans, glacial and/or fluvial terraces, floodplains, hanging valleys)
- Valley Types I through X (see Rosgen, 1996)

Products (Maps and/or Layers)

- Drainage systems
 - Geologic terrace elevations
 - Channel Slope
 - Channel Bed features
 - Channel Shape
 - Floodplain extent
 - Channel Pattern
 - Confinement
 - Landforms
 - Valley types
- 

Products (Report Sections)

- Narrative of the geomorphic characterization delineation methods and findings.
- Note that Level I classification is preliminary and will need to be supported by field measurements in Level II classification.
- References

Landscape And Streams

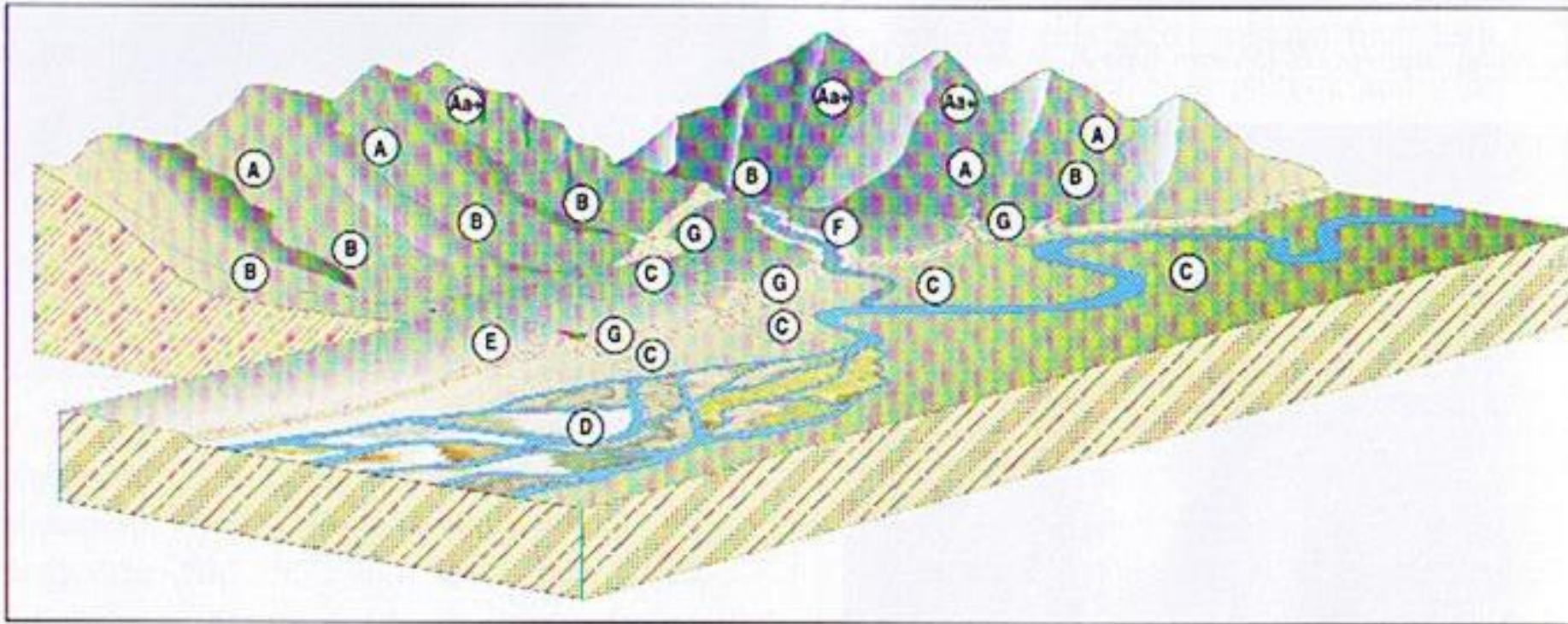
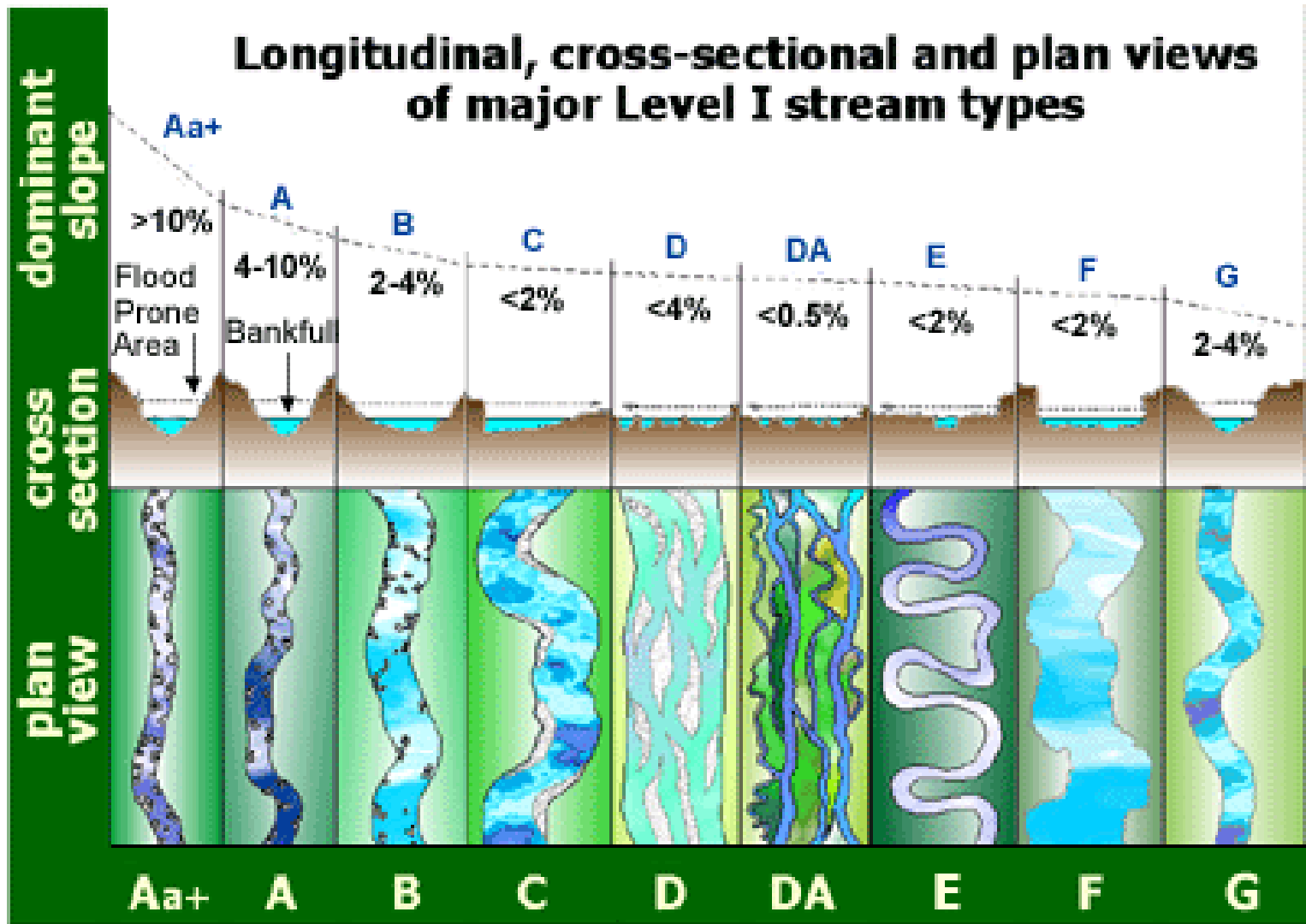
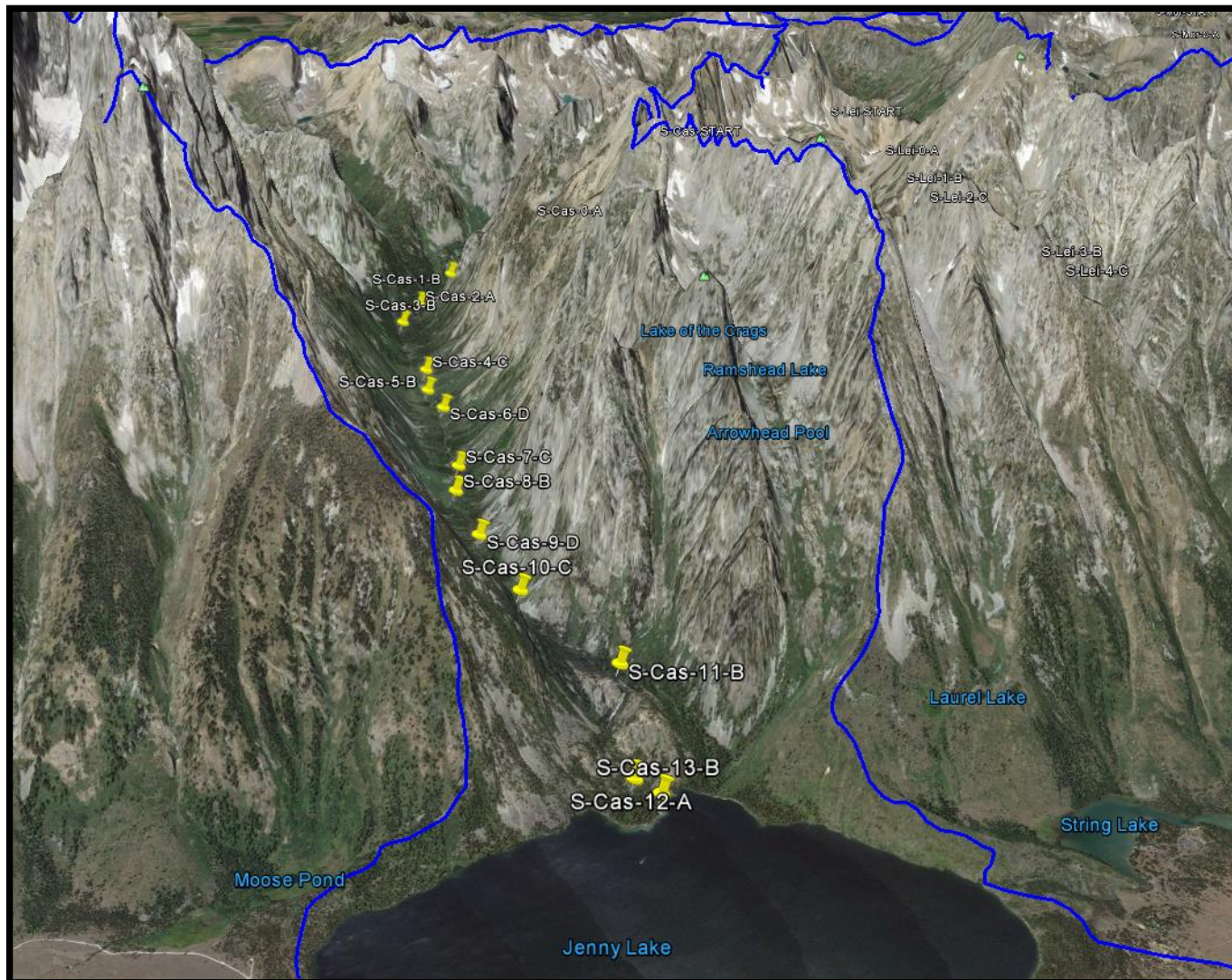


FIGURE 4-22. Example of broad level delineation of stream types at Level I.

How we Classify



Example – Upper Snake River

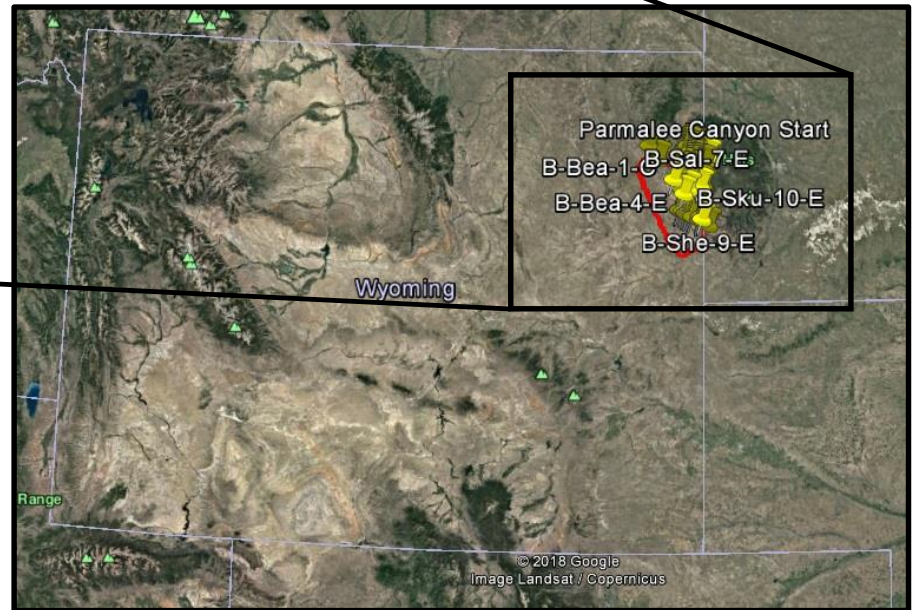
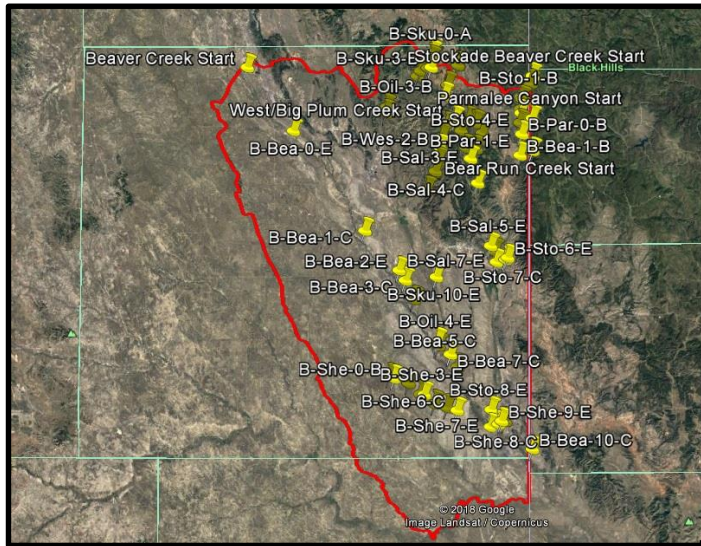


Example – Upper Snake River

REACH ID	WATERSHED	REACH NAME	REACH NUMBER	LANDFORM	VALLEY TYPE
S-Cas-0-A	Snake River	Cascade Creek	0	glacial/fluvial terrace	I
S-Cas-1-B	Snake River	Cascade Creek	1	glacial/fluvial terrace	II
S-Cas-2-A	Snake River	Cascade Creek	2	glacial/fluvial terrace	I
S-Cas-3-B	Snake River	Cascade Creek	3	glacial/fluvial terrace	II
S-Cas-4-C	Snake River	Cascade Creek	4	glacial/fluvial terrace	VIII
S-Cas-5-B	Snake River	Cascade Creek	5	glacial/fluvial terrace	VIII
S-Cas-6-D	Snake River	Cascade Creek	6	glacial/fluvial terrace	V
S-Cas-7-C	Snake River	Cascade Creek	7	glacial/fluvial terrace	VIII
S-Cas-8-B	Snake River	Cascade Creek	8	glacial/fluvial terrace	VIII
S-Cas-9-D	Snake River	Cascade Creek	9	glacial/fluvial terrace	V
S-Cas-10-C	Snake River	Cascade Creek	10	glacial/fluvial terrace	VIII
S-Cas-11-B	Snake River	Cascade Creek	11	glacial/fluvial terrace	VIII
S-Cas-12-A	Snake River	Cascade Creek	12	glacial/fluvial terrace	I
S-Cas-13-B	Snake River	Cascade Creek	13	glacial/fluvial terrace	VIII

TERRACE FEATURE	CHANNEL SLOPE	BED FEATURES	CHANNEL SLOPE	FLOODPLAIN	PATTERN	CONFINEMENT	LATERAL CONFINEMENT	CHANNEL TYPE
none	steep	step/pool	<12 w:d	none apparent	single	entrenched	yes	A
none	steep	step/pool	<12 w:d	none apparent	single	moderate	yes	B
none	steep	step/pool	<12 w:d	none apparent	single	entrenched	yes	A
none	steep	step/pool	<12 w:d	none apparent	single	moderate	yes	B
none	flat	riffle/pool	12-40 w:d	active apparent	single	slight	no	C
none	steep	step/pool	12-40 w:d	none apparent	single	moderate	yes	B
multiple	flat	riffle/pool	12-40 w:d	active apparent	multiple	slight	no	D
none	flat	riffle/pool	12-40 w:d	active apparent	single	slight	no	C
none	steep	step/pool	12-40 w:d	none apparent	single	moderate	yes	B
multiple	flat	riffle/pool	>40 w:d	active apparent	multiple	slight	no	D
none	flat	riffle/pool	12-40 w:d	active apparent	single	slight	no	C
none	steep	step/pool	12-40 w:d	none apparent	single	moderate	yes	B
none	steep	step/pool	<12 w:d	none apparent	single	entrenched	yes	A
none	steep	step/pool	12-40 w:d	none apparent	single	moderate	yes	B

Stream Classification



Stream Classification



Stream Classification

Reach ID - Formula	Watershed	Reach Name	Sub-Branch	Reach Number	Reach Length	Landform	Valley Type	Terrace Features
B-Wes-0-B	Beaver Creek	West-Big Plum Creek		0	1.43	glacial/fluvial terrace	II	none
B-Wes-1-E	Beaver Creek	West-Big Plum Creek		1	1.82	glacial/fluvial terrace	VIII	none
B-Wes-2-B	Beaver Creek	West-Big Plum Creek		2	1.48	glacial/fluvial terrace	VIII	none
B-Wes-3-E	Beaver Creek	West-Big Plum Creek		3	1.82	glacial/fluvial terrace	VIII	none
B-Wes-4-B	Beaver Creek	West-Big Plum Creek		4	1.38	glacial/fluvial terrace	VIII	none
B-Wes-5-E	Beaver Creek	West-Big Plum Creek		5	2.73	glacial/fluvial terrace	VIII	none

Reach ID - Formula	Channel Slope	Bed Features	Channel Shape	Floodplain	Pattern	Confinement	Lateral Containment	Channel Bank
B-Wes-0-B	steep	step/pool	<12 w:d	none apparent	single	moderate	yes	B
B-Wes-1-E	flat	riffle/pool	<12 w:d	active apparent	single	slight	no	E
B-Wes-2-B	steep	step/pool	<12 w:d	none apparent	single	moderate	yes	B
B-Wes-3-E	flat	riffle/pool	<12 w:d	active apparent	single	slight	no	E
B-Wes-4-B	steep	step/pool	<12 w:d	active apparent	single	moderate	no	B
B-Wes-5-E	flat	riffle/pool	<12 w:d	active apparent	single	slight	no	E

Progress:

- Level I Stream Channel Classification is mostly complete.
- Data still being interpreted into useable charts and graphs for final report.

Questions:

Long Term Uses of Level I Stream Classification?

- on going channel restoration and stabilization as projects develop

Needs and wants of the watershed users?

- design and implement water development projects specific to stream channel classification

Why Do We Perform a Level I Study?

- For long term planning, sustainability, and projects

Irrigation Diversions



Crystal Creek, Wyoming

Bank Stabilization

From here.....



To here.....



Clear Creek, Wyoming

Increase stream function and habitat

From here.....



To here.....

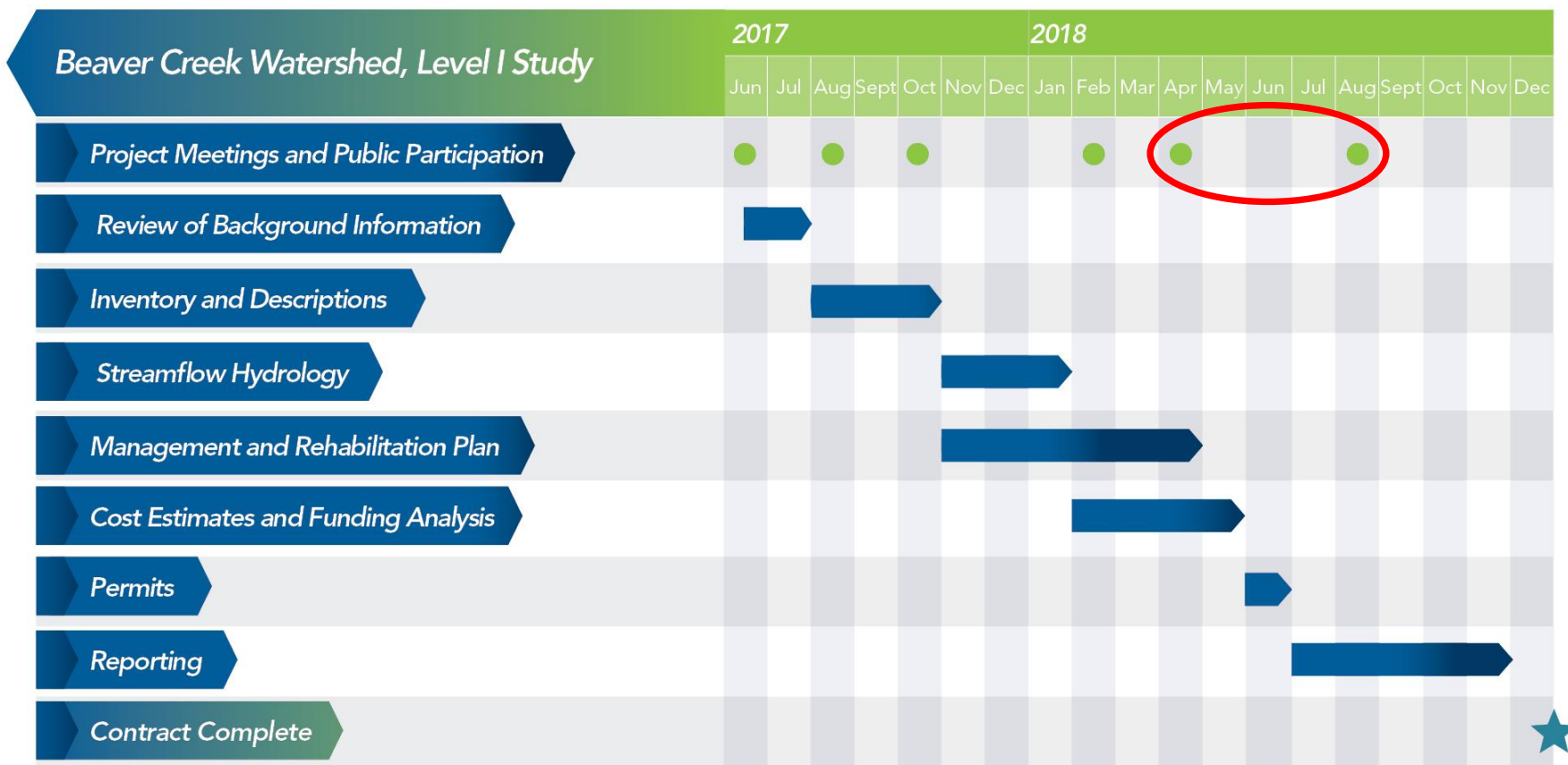


Little Piney Creek, Wyoming

QUESTIONS?



What's Next



Project Schedule = June 2017 – December 2018

What's Next

HANDOUT

- Project List

- Do you have a project?
- Are you on the list?
- Please pick up your file.
- Review the information and get back to us!
 - Call us
 - Email us
 - Mail info to us
- April the final field visits will be scheduled

Last Name	First	Site Visit	Area Visit Assigned & To	Area Project and Location	Cost Estimate	NOTES
Bayne	Clyde	10/23/17	KO	Yes	IP	
Bracecum	Clay	Schedule Spring '18				
Brown	Susan	10/1/17	KO	Yes	IP	
Burlison	Colter	5/23/17	KG, BD	Yes	IP	
Calmey	William	10/1/17	KO	Yes	IP	
Commiss	Reed	10/2/17	KG	Yes	IP	
Cressen	Carla	10/1/17	KG	Yes	IP	
Darlington	Jim	10/2/17	KG, BD	Yes	IP	
Engle	Bill	10/1/17	KG	Yes	IP	
Frederick	Lex & Nancy	10/1/17	KG	Yes	IP	
Hennertoy	David	10/1/17	KG	Yes	IP	
Hiser	Omnie	10/1/17	KO	Yes	IP	
Hollenback	Pat	10/1/17	KG	Yes		
Knigge	Michael	Navin needed	KG	NA		
Laurie	Betty Jean	10/2/17	KO	Yes	IP	
Laurie	James	10/2/17	KO	Yes	IP	
Laurie	Tyler & James	fall 2017	KO	Yes		
Livingston	Doug and Peggy	10/2/17	RV	Yes	IP	
McDuffee	Catherine	Navin needed	KG	NA		
Miller	Justin	fall 2017	KO	Yes	IP	
Neal	Allen and Glenda	10/5/17	KG	Yes	IP	
Perine	Jim	10/1/17	KG	Yes	IP	
Peterson	Jean	10/2/17	KG	Yes	IP	
Pagano	Micha	10/5/17	KG	Yes	IP	
Parker	William	No response	TK	NA		
Rauhauer	Donald	8/20/17	KG	Yes	IP	
Rierson	Randy	8/20/17	KG	Yes	IP	
Sandrini	Jay & Shaunda	8/23/17	KG	Yes	IP	
Schaeffer	Judy	10/2/17	KO	Yes	IP	
Simon	Diane	8/23/17	KG	Yes	IP	
Sublink	Dave	late 2017	KO	Yes	IP	
Tougas	Jerry, Mary	Notes from MT	KG		IP	
Thomson	Chris	No response	KG			
Tidman	Jan	6/28/17	KG, BD	Yes	IP	
Turner	Pat	fall 2017	KO	Yes	IP	
Tyrdal	Laurie and Tim	10/4/17	KG	Yes	Yes	
Waddle	Paul & Neva	Navin needed	NA			
Weyrich	Kraig & Stacy	fall 2017	KO	Yes		
Specific Project Identified, Keep informed						
Blatnik	Ray	NA	NA	NA		
Crow	Barbara	10/2/17	RV	NA		
Fardella	Randall	No response	KG			
Field	Lisa	NA	NA	NA		
Fulton	Josephine	NA	NA	NA		
Leonard	Linda	NA	KG	NA		
Martens	Steven & Rebecca	No response	KG	NA		
Sack	Norm	NA	NA	NA		
True	Elijah E	NA	NA	NA		
Notes:						
KG - Karen G						
KO - Keith Oulver						
RV - Ron Vero						
BD - Brian Deane						
NA - Not applicable						
IP - In Progress						

What's Next

- Two More Project Meetings
 - Tuesday, April 24, 2018
 - Summary of Hydrology/Hydrogeology
 - **Final field visits**
 - Mid-September, 2018
 - Watershed Study Results Presentation