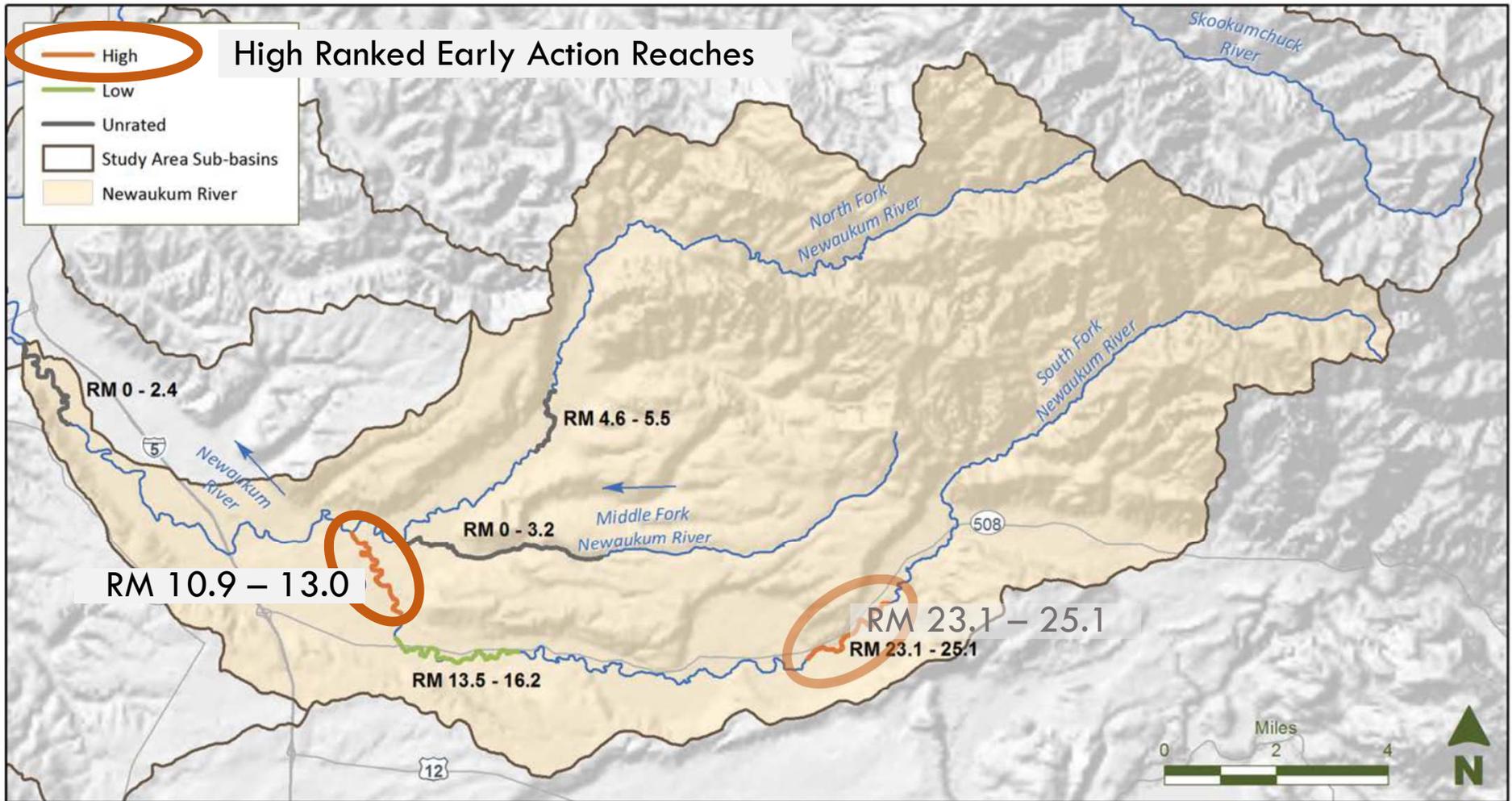
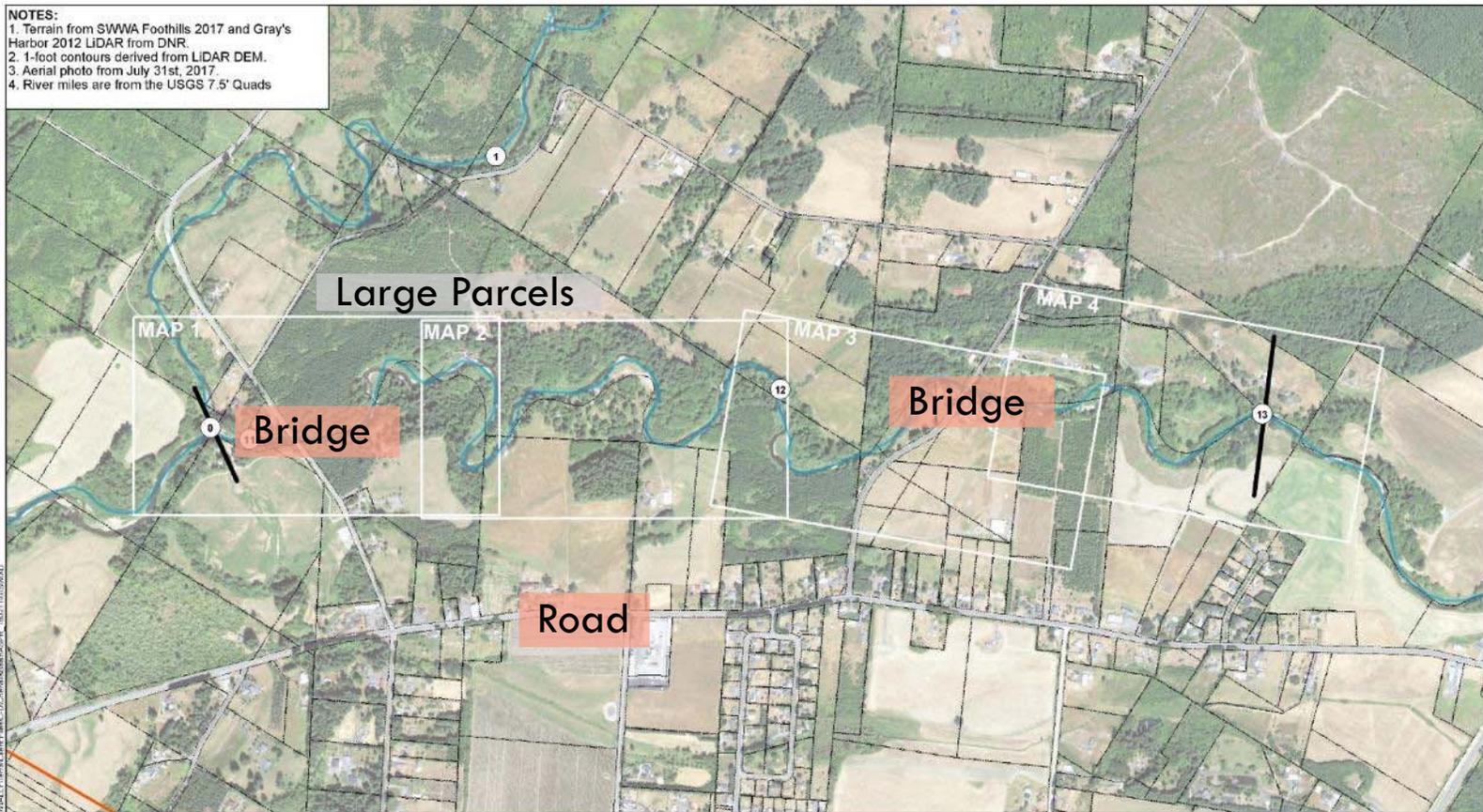


# Newaukum Sub-Basin



# South Fork Newaukum RM 10.9 – 13.0

- NOTES:**
1. Terrain from SWWA Foothills 2017 and Gray's Harbor 2012 LIDAR from DNR.
  2. 1-foot contours derived from LIDAR DEM.
  3. Aerial photo from July 31st, 2017.
  4. River miles are from the USGS 7.5' Quads



DRAFT



Projection: NAD 1983  
State Plane Washington South FIPS 4602



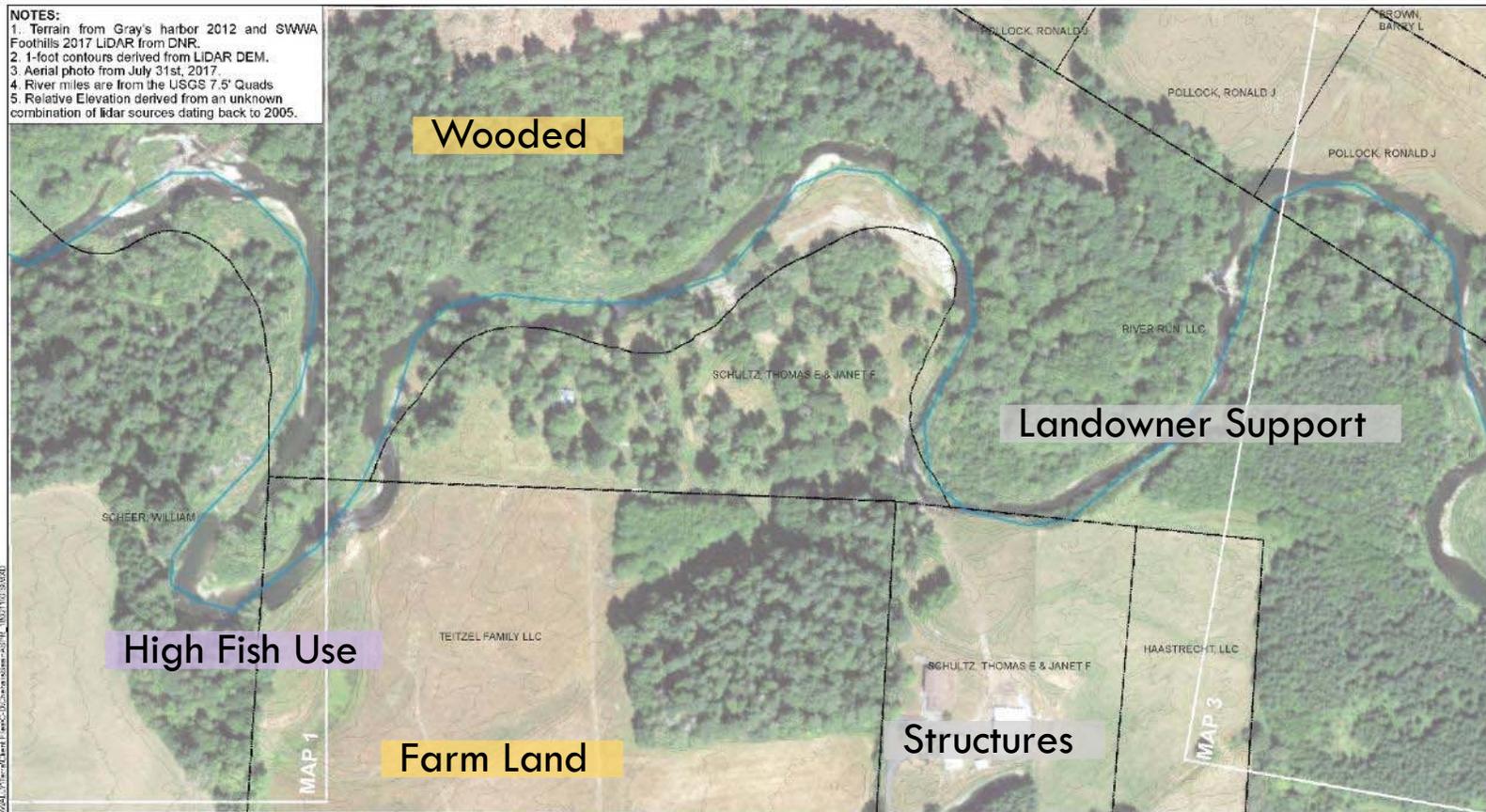
- Map Matchlines
- Parcels
- River Miles

**River Survey - Full Reach**

Early Action Reach RM: 10.9 to 13.0  
South Fork Newaukum River, WA  
Chehalis Basin ASRP Design

# South Fork Newaukum | RM 10.9 – 13.0

## Aerial Photo and Parcels



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Projection: NAD 1983  
State Plane Washington South FIPS 4602



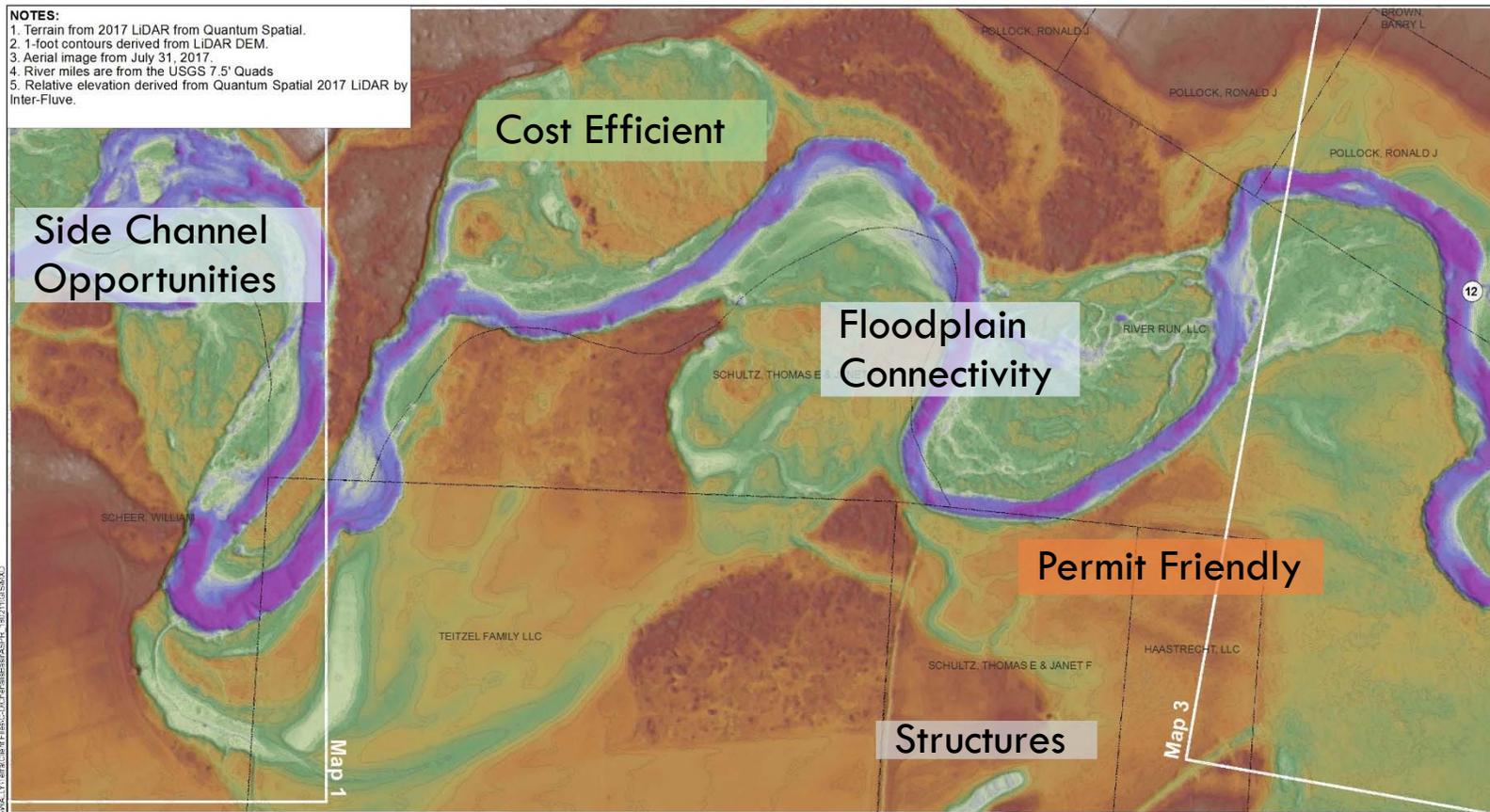
- Contours 1ft
- Map Matchlines
- Parcels
- River Miles

River Survey - Map 2 of 4

Early Action Reach RM: 10.9 to 13.0  
South Fork Newaukum River, WA  
Chehalis Basin ASRP Design

# South Fork Newaukum | RM 10.9 – 13.0

## Relative Elevation Map



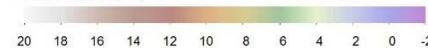
DRAFT



Projection: NAD 1983  
State Plane Washington South FIPS 4602



Relative Elevation (feet)



- Map Matchlines
- Parcels
- River Miles

River Survey - Map 2 of 4

Early Action Reach RM: 10.9 to 13.0  
South Fork Newaukum River, WA  
Chehalis Basin ASRP Design

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



Large Wood

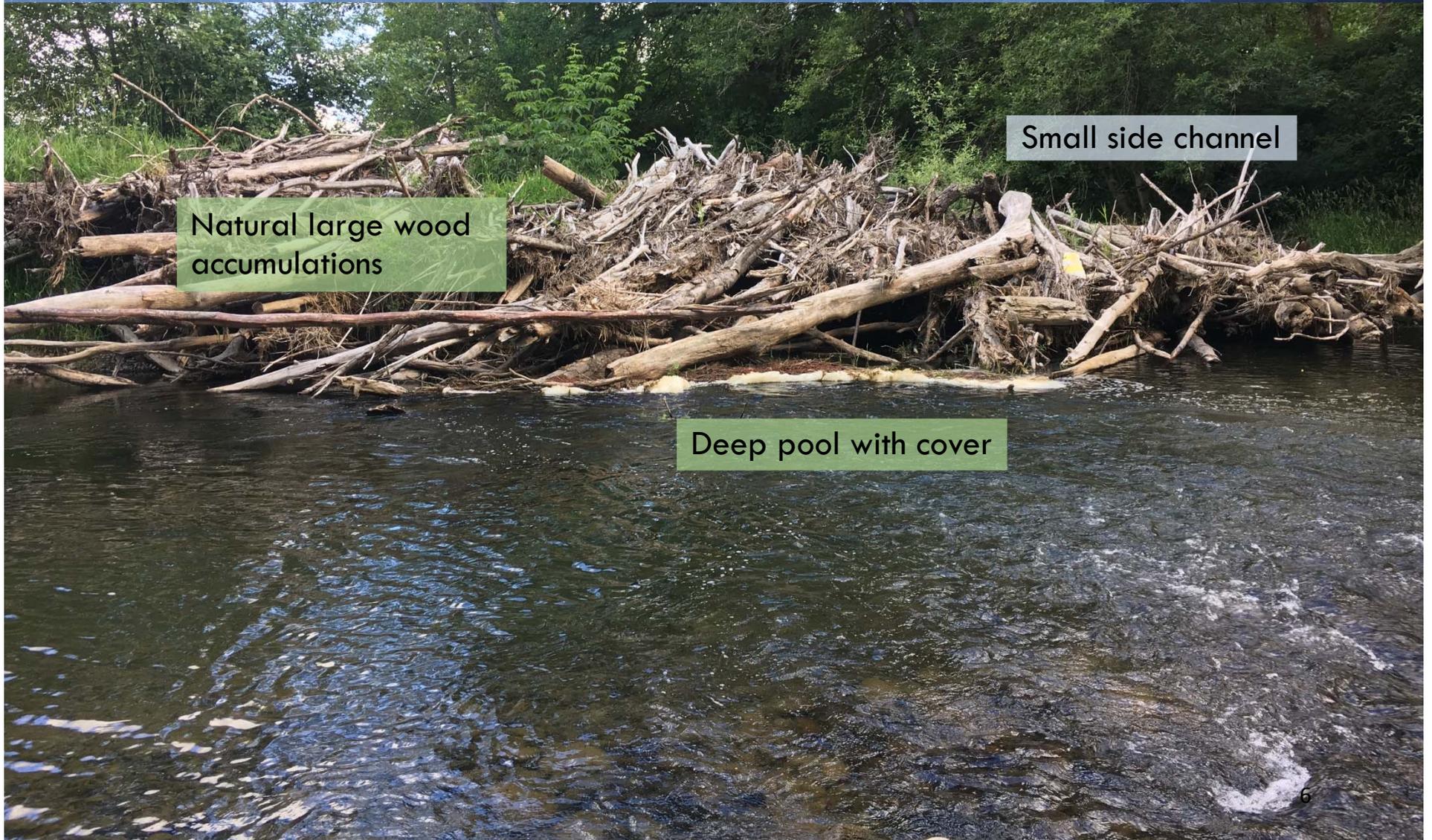
Deep Pools

Limited Shading

Clean Gravels

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



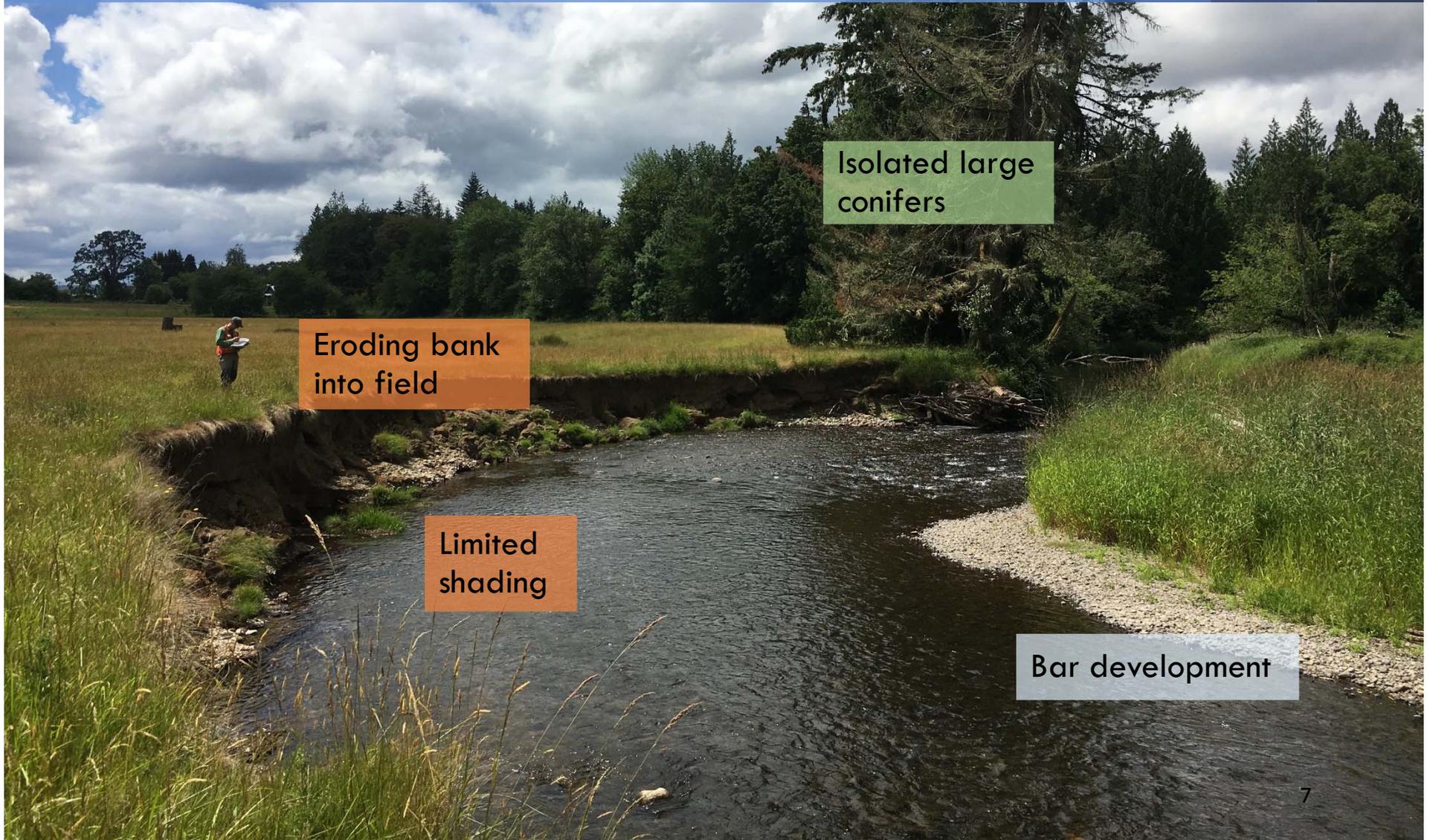
Natural large wood accumulations

Small side channel

Deep pool with cover

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



Eroding bank into field

Limited shading

Isolated large conifers

Bar development

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



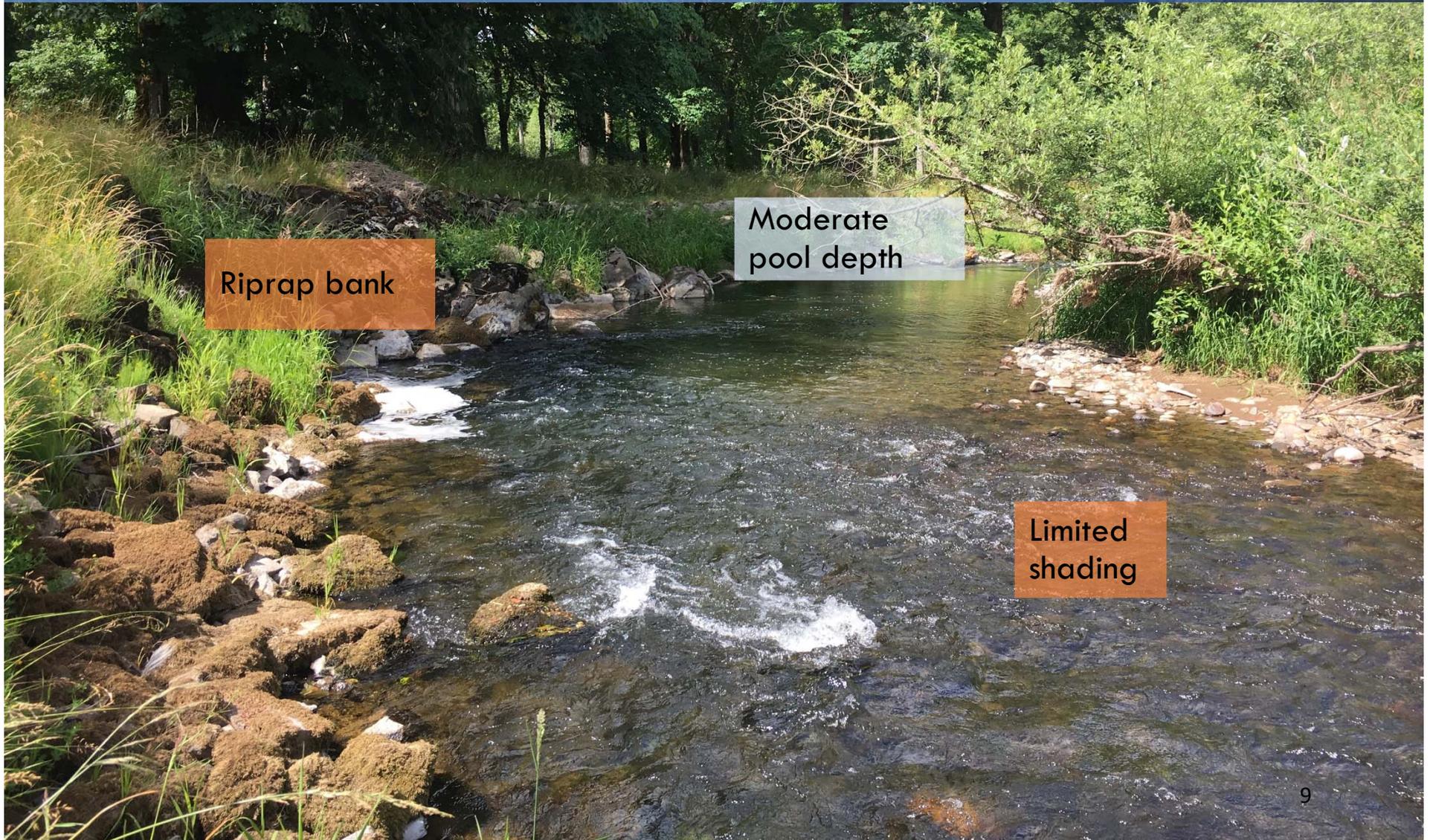
Deep pool  
with no  
structure

Limited  
shading

Fencing to  
the edge

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



Riprap bank

Moderate pool depth

Limited shading

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos

Young forest

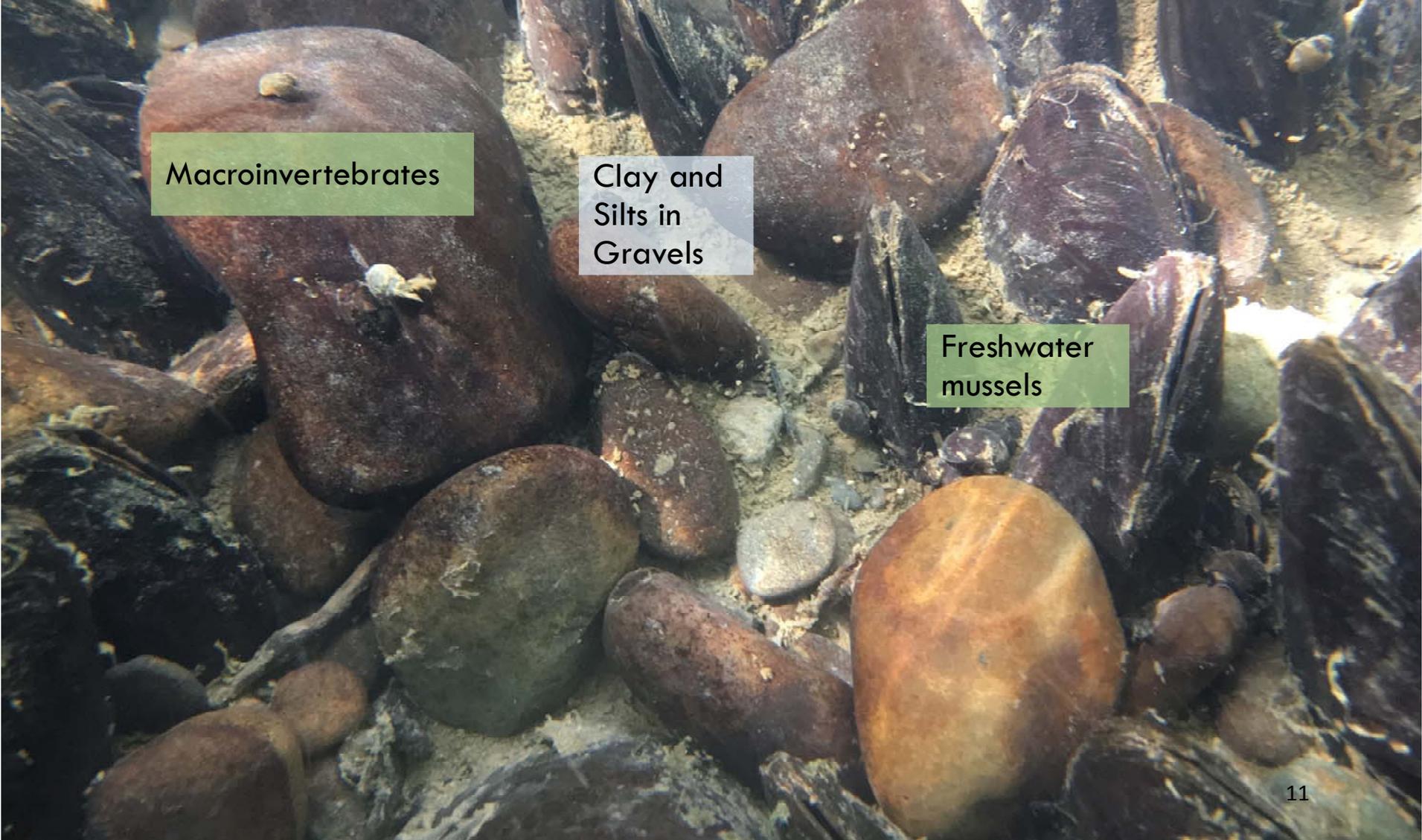
Limited bar  
development

High  
banks

Plane bed  
channel

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



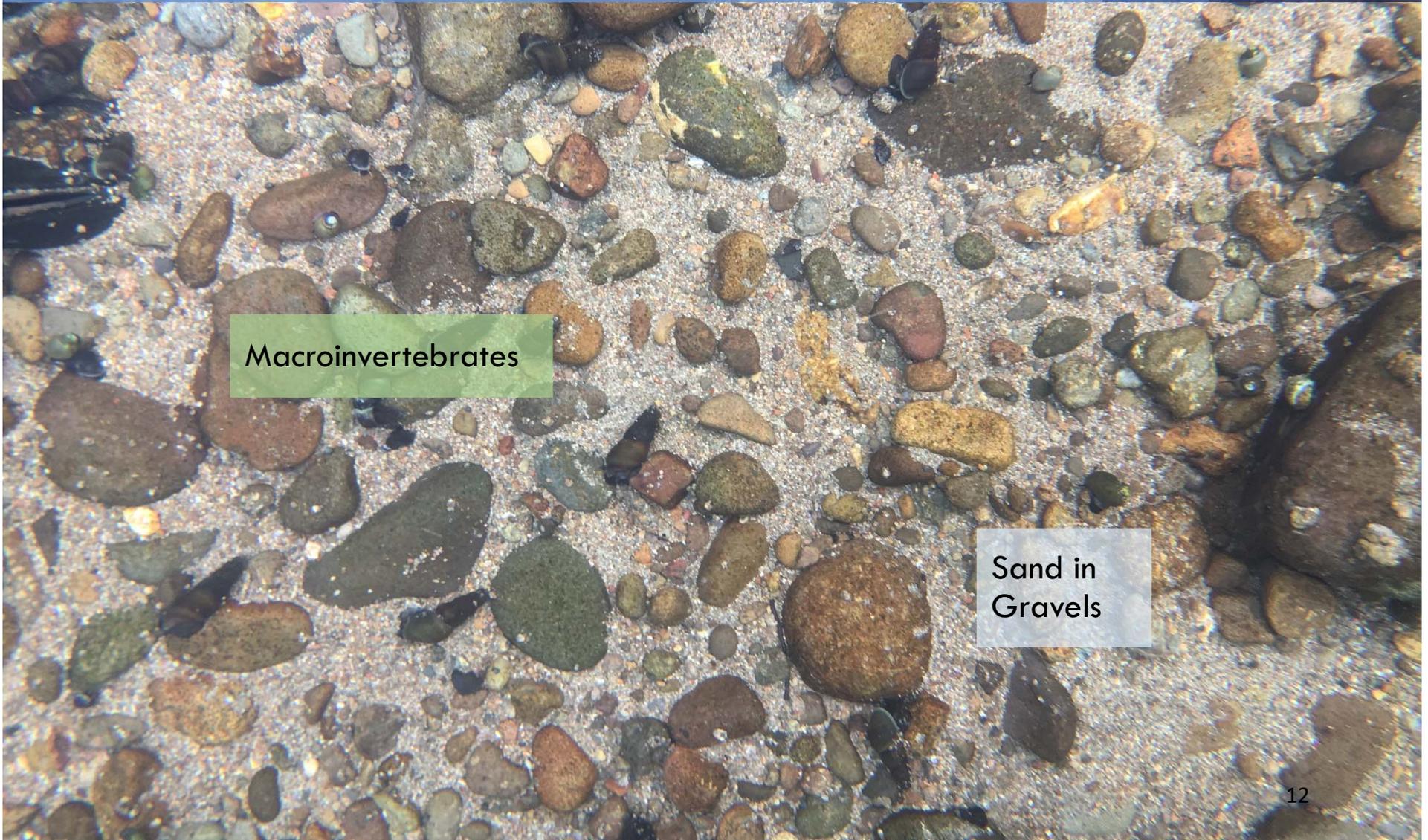
Macroinvertebrates

Clay and  
Silts in  
Gravels

Freshwater  
mussels

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



Macroinvertebrates

Sand in Gravels

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



High terrace

Second  
growth forest

Native Plants

# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



Younger trees

Mowed access routes

Grassy floodplain

# South Fork Newaukum | RM 10.9 – 13.0

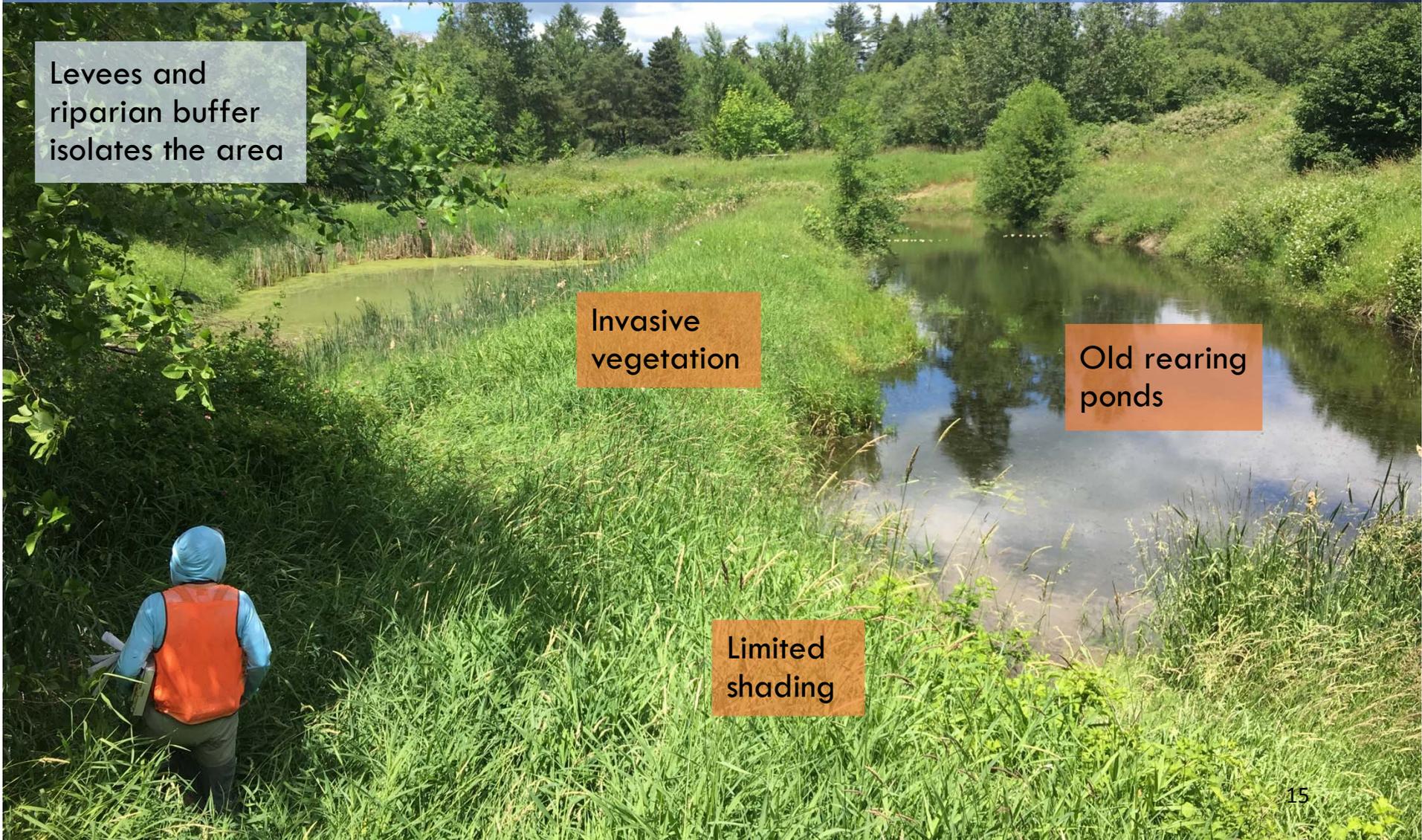
## Representative Photos

Levees and riparian buffer isolates the area

Invasive vegetation

Old rearing ponds

Limited shading



# South Fork Newaukum | RM 10.9 – 13.0

## Representative Photos



Isolated alcove

Grassy floodplain

# South Fork Newaukum | RM 10.9 – 13.0

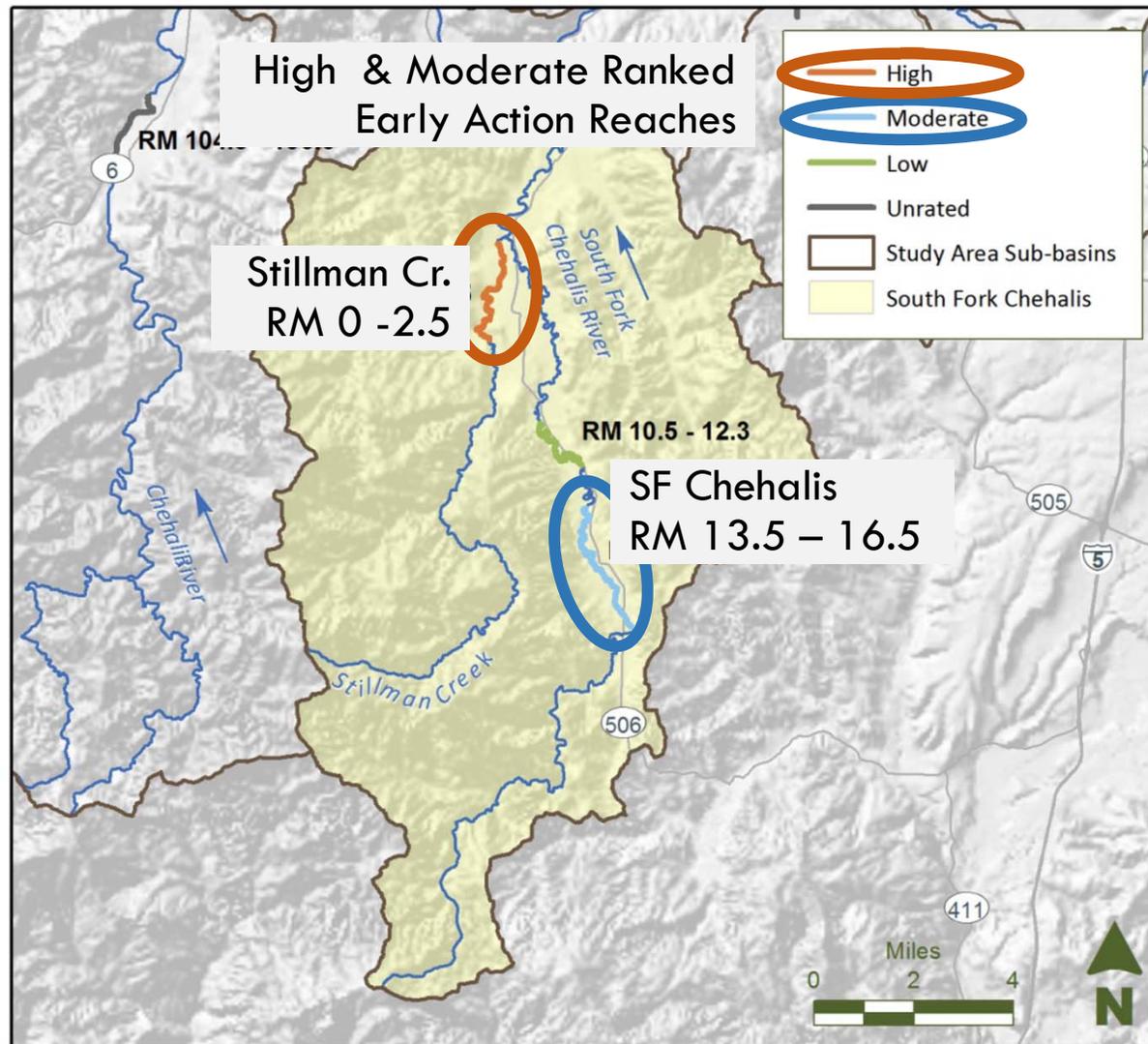
## Reach Summary

### Criteria

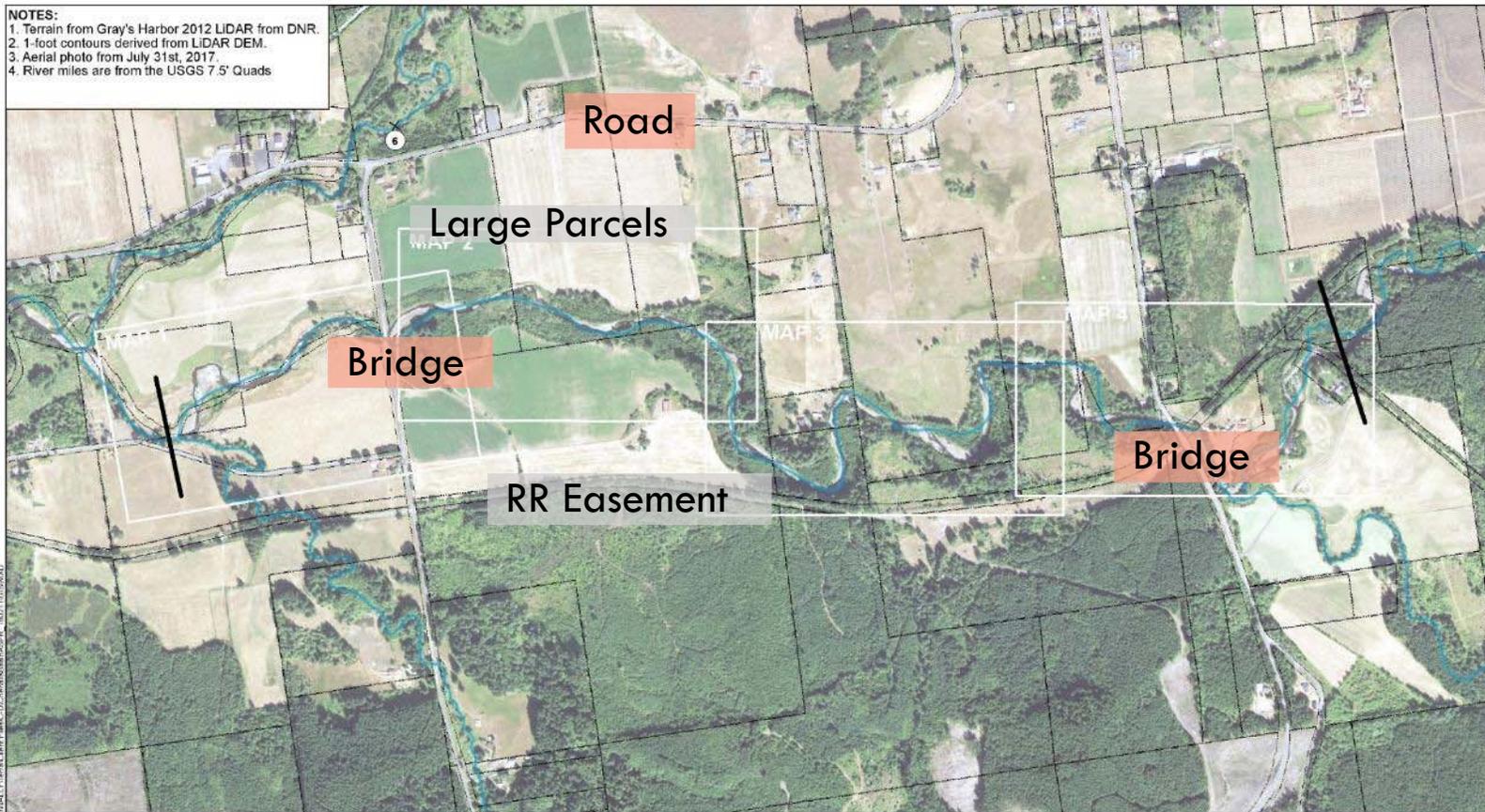
RM 10.9 – 13.0

Ecological Metrics	Connected floodplain, side chls.
Fish & Other Species Use	Salmon use, freshwater mussels
Natural Process	Wooded, planform freedom
Landowner Support	Large parcels, willing
Risk & Public Safety	Bridges
Permitting	No issues identified
Project Unit Cost	Cost effective
Summary	Cool projects, willing owners

# South Fork Chehalis Sub-Basin



# Stillman Creek RM 0 – 2.5



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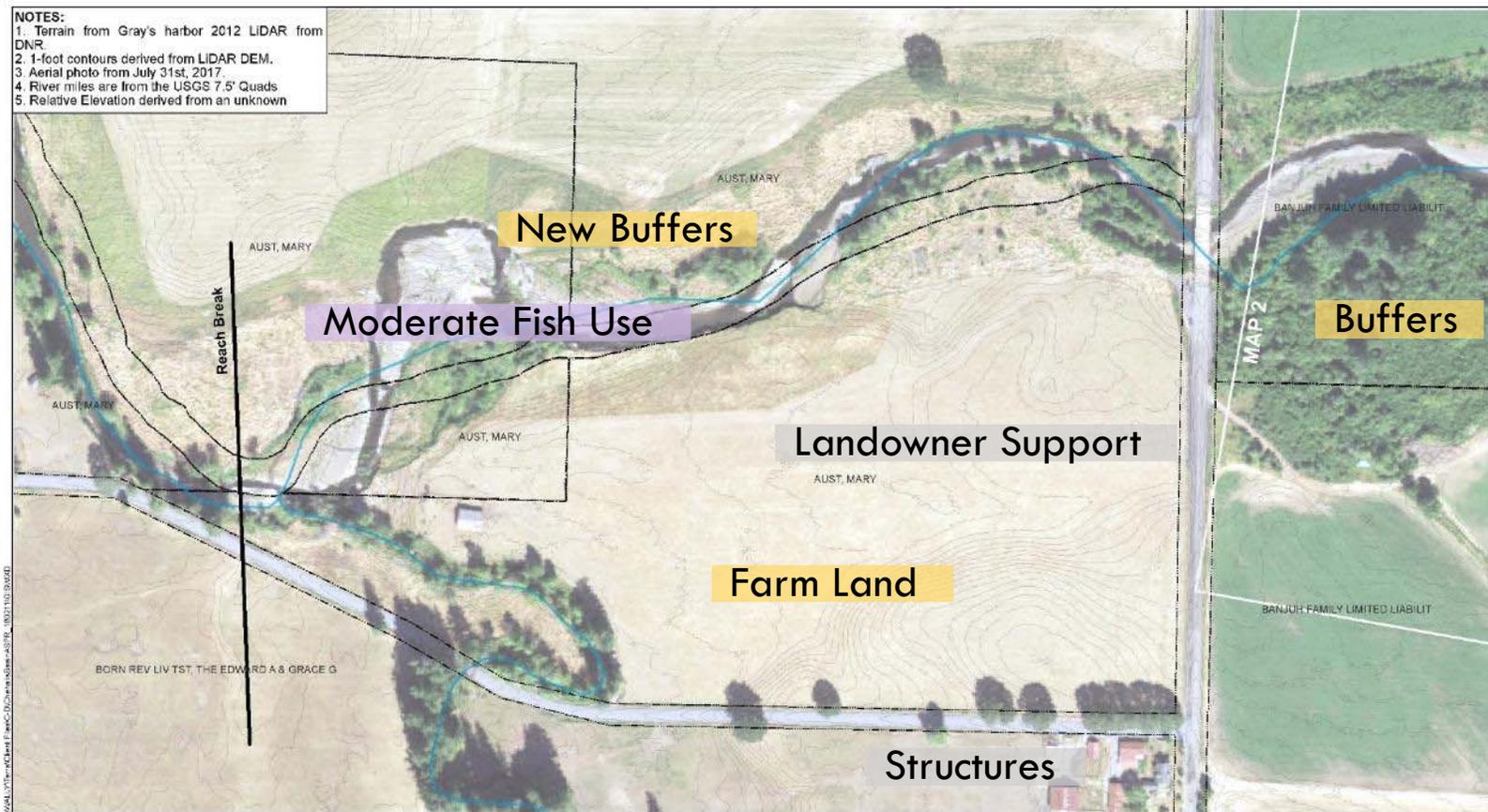


- Map Matchlines
- Parcels
- River Miles

**River Survey - Full Reach**  
 Early Action Reach RM: 0 to 2.5  
 Stillman Creek, WA  
 Chehalis Basin ASRP Design

# Stillman Creek | RM 0 – 2.5

## Aerial Photo and Parcels



DRAFT



Projection: NAD 1983  
 State Plane Washington South FIPS 4602



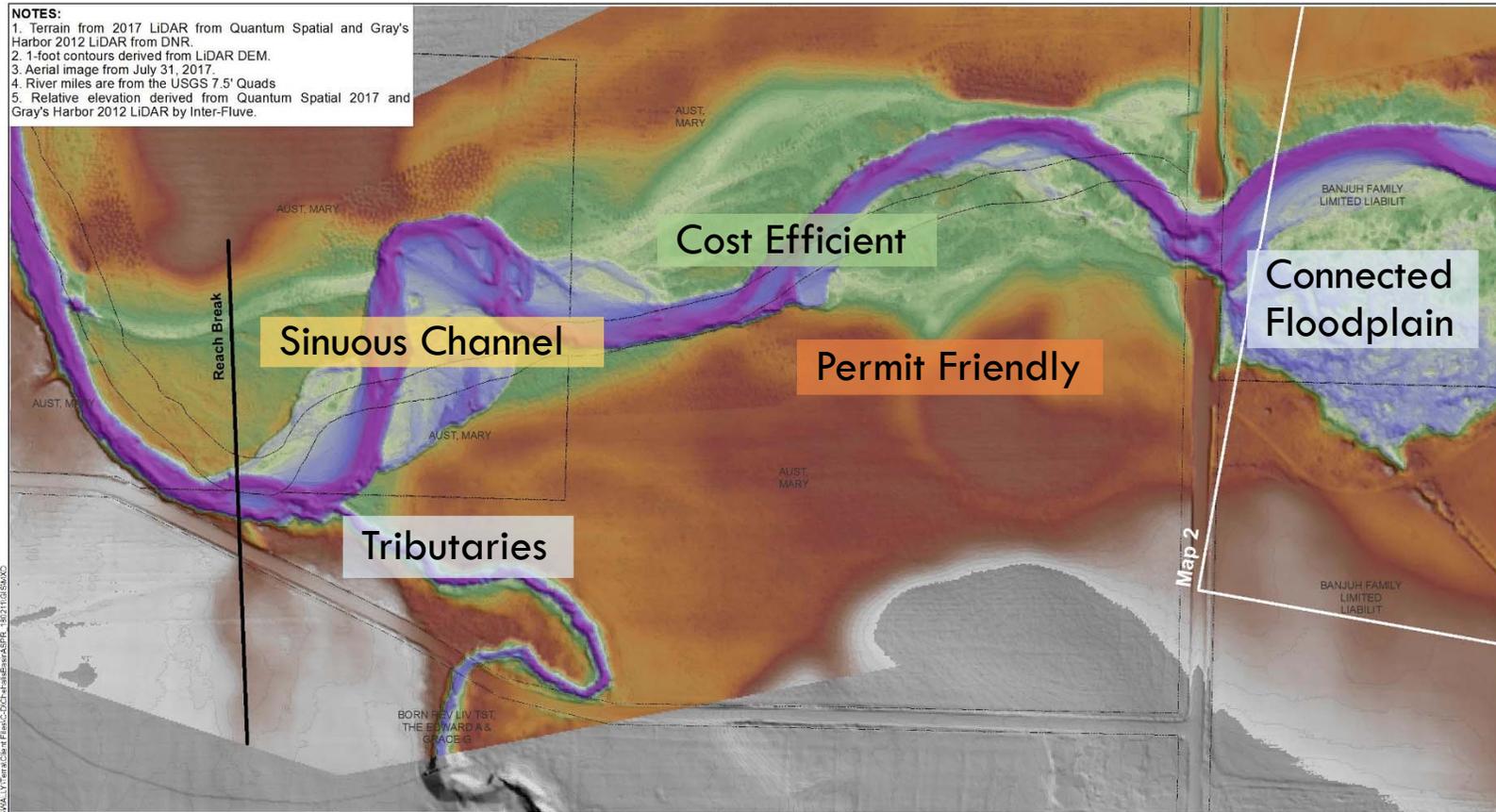
- Contours 1ft
- Map Matchlines
- Parcels
- River Miles

River Survey - Map 1 of 4

Early Action Reach RM: 0 to 2.5  
 Stillman Creek, WA  
 Chehalis Basin ASRP Design

# Stillman Creek | RM 0 – 2.5

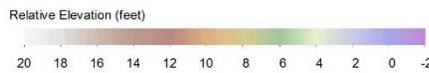
## Relative Elevation Map



DRAFT



Projection: NAD 1983  
State Plane Washington South FIPS 4602



- Map Matchlines
- Parcels
- River Miles

River Survey - Map 1 of 4

Early Action Reach RM: 0 to 2.5  
Stillman Creek, WA  
Chehalis Basin ASRP Design

# Stillman Creek | RM 0 – 2.5

## Representative Photos



Fair Riparian

Large wood

Channel complexity

# Stillman Creek | RM 0 – 2.5

## Representative Photos



Large wood

Limited riparian

Bar development

# Stillman Creek | RM 0 – 2.5

## Representative Photos

Limited riparian

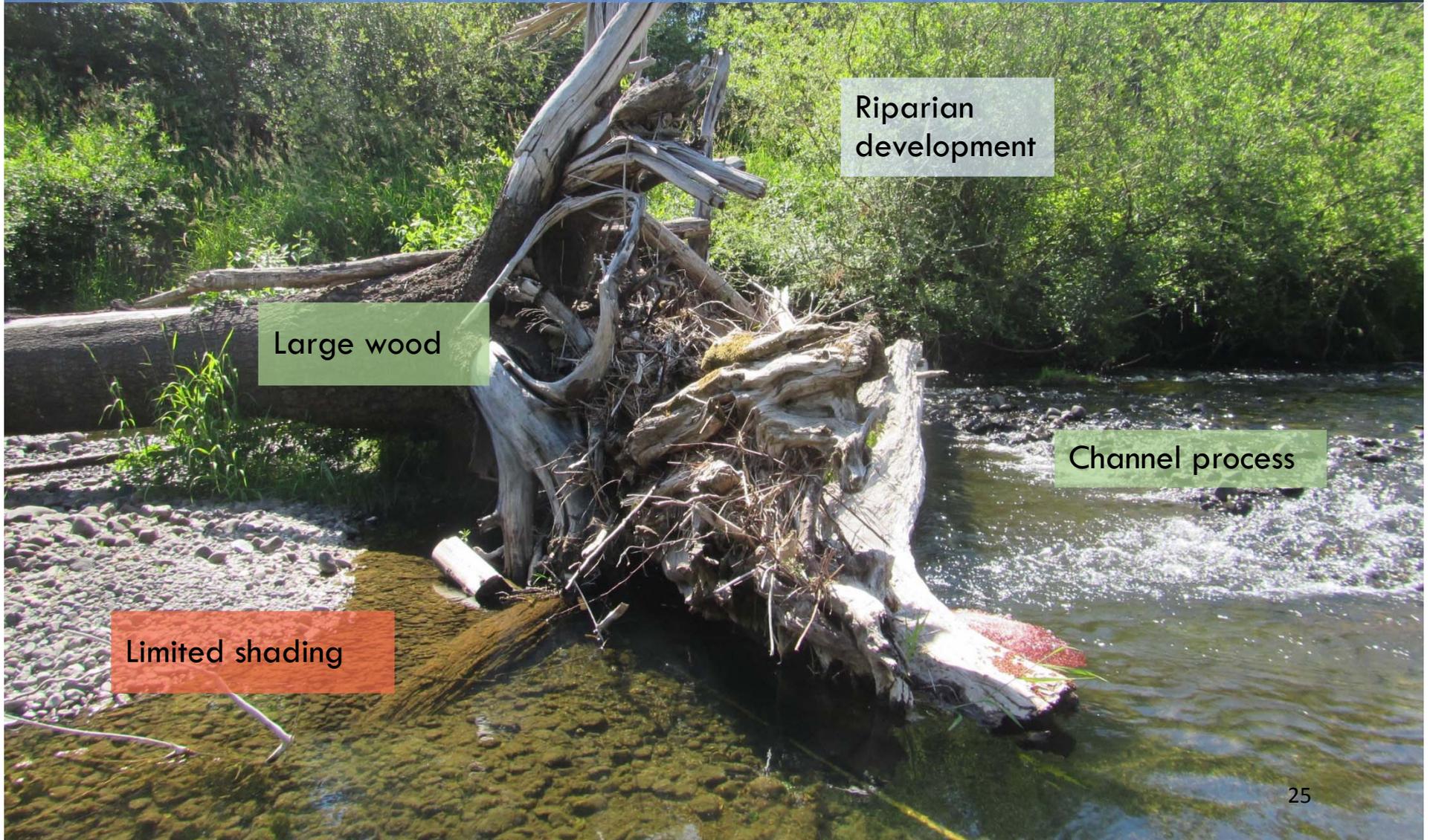
High  
banks

Pools with  
limited cover

Bar  
development

# Stillman Creek | RM 0 – 2.5

## Representative Photos



Riparian  
development

Large wood

Channel process

Limited shading

# Stillman Creek | RM 0 – 2.5

## Representative Photos



Riparian re-growth

Old large wood

Limited shading

# Stillman Creek | RM 0 – 2.5

## Representative Photos



Thick riparian

Bank erosion

Limited shading

Bar development

# Stillman Creek | RM 0 – 2.5

## Representative Photos



Thin riparian

Bank erosion

Bar development

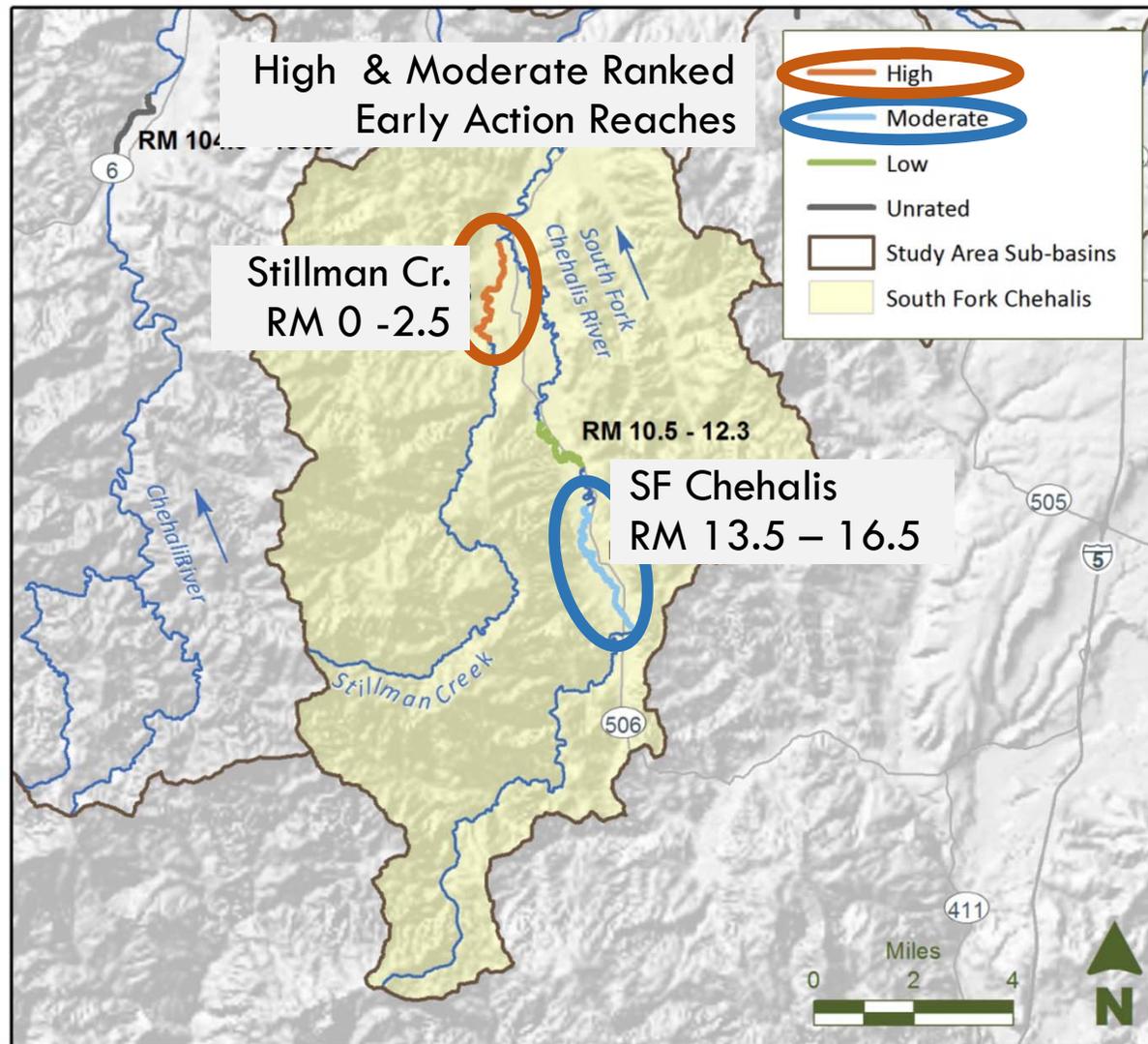
Limited shading

# Stillman Creek | RM 0 – 2.5

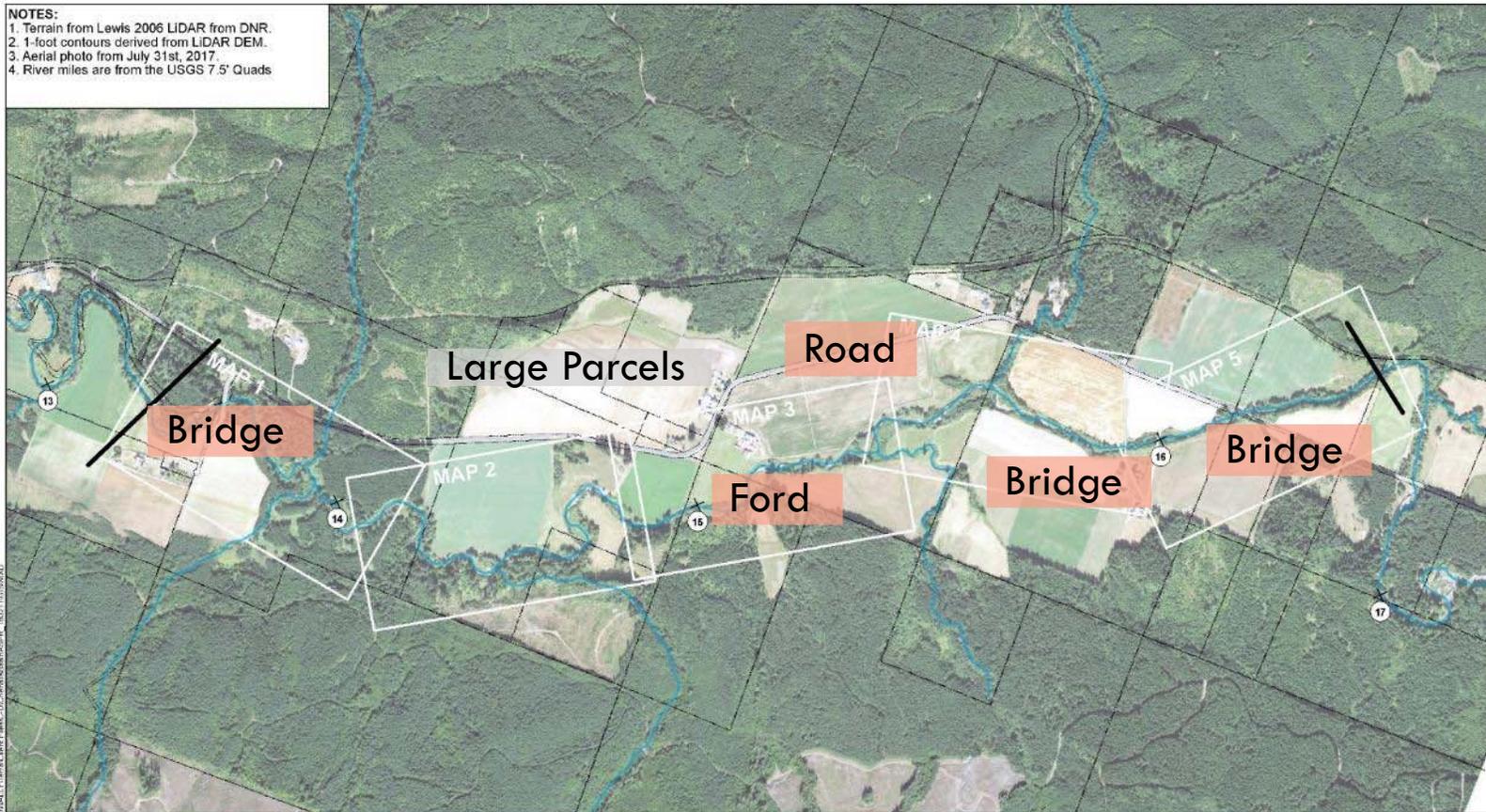
## Reach Summary

Criteria	Stillman Cr. RM 0-2.5
Ecological Metrics	Tributaries, connected floodplain
Fish & Other Species Use	Salmon
Natural Process	Farm land, new buffers, sinuosity
Landowner Support	Large parcels
Risk & Public Safety	Bridges
Permitting	Permittable
Project Unit Cost	Cost effective
Summary	Cost effective project opportunities

# South Fork Chehalis Sub-Basin



# South Fork Chehalis RM 13.5 – 16.5



DRAFT



Projection: NAD 1983  
 State Plane Washington South FIPS 4602



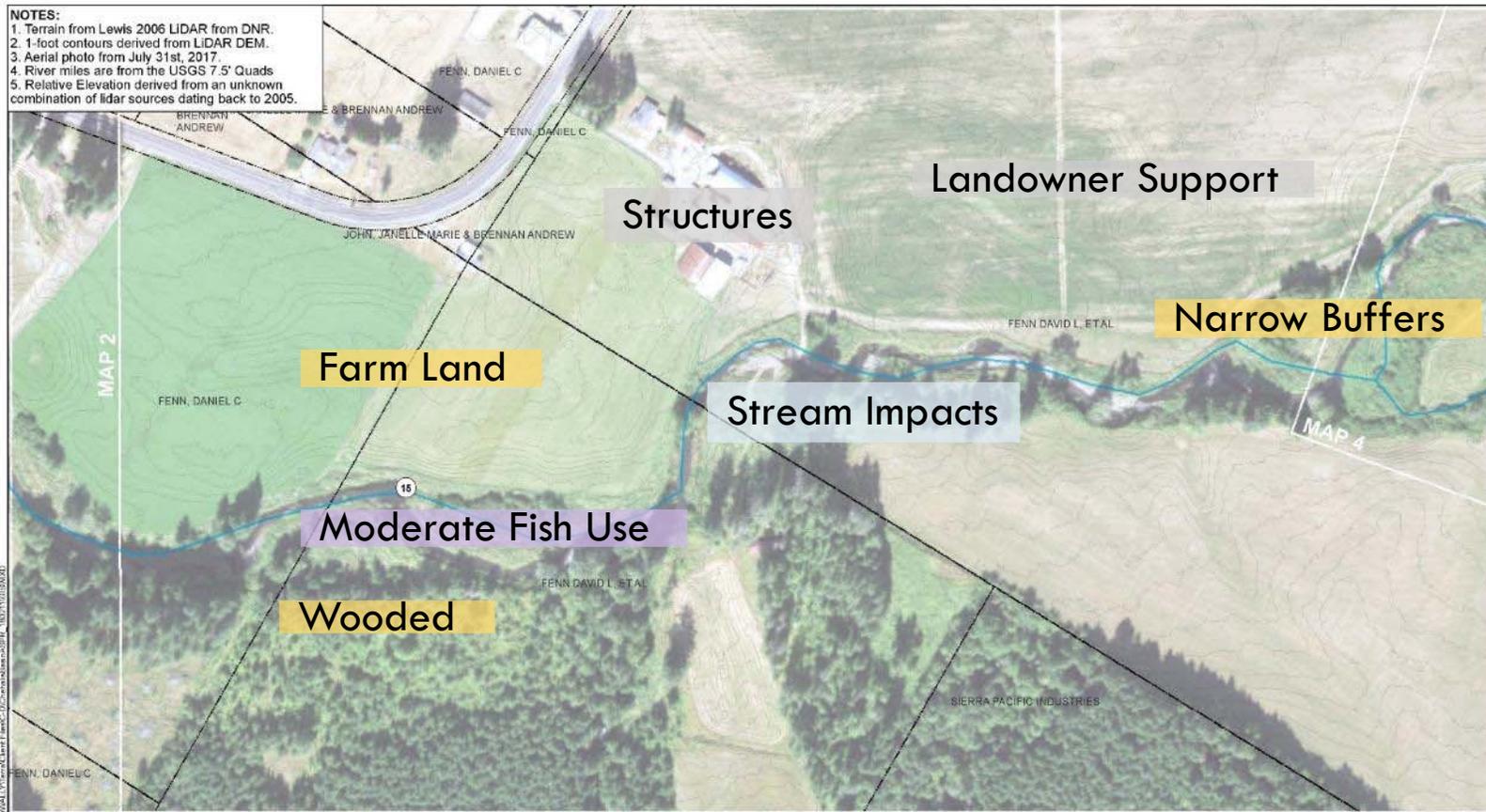
- Map Matchlines
- Parcels
- River Miles

**River Survey - Full Reach**

Early Action Reach RM: 13.5 to 16.5  
 Middle South Fork Chehalis River, WA  
 Chehalis Basin ASRP Design

# South Fork Chehalis | RM 13.5 – 16.5

## Aerial Photo and Parcels



DRAFT



Projection: NAD 1983  
State Plane Washington South FIPS 4602



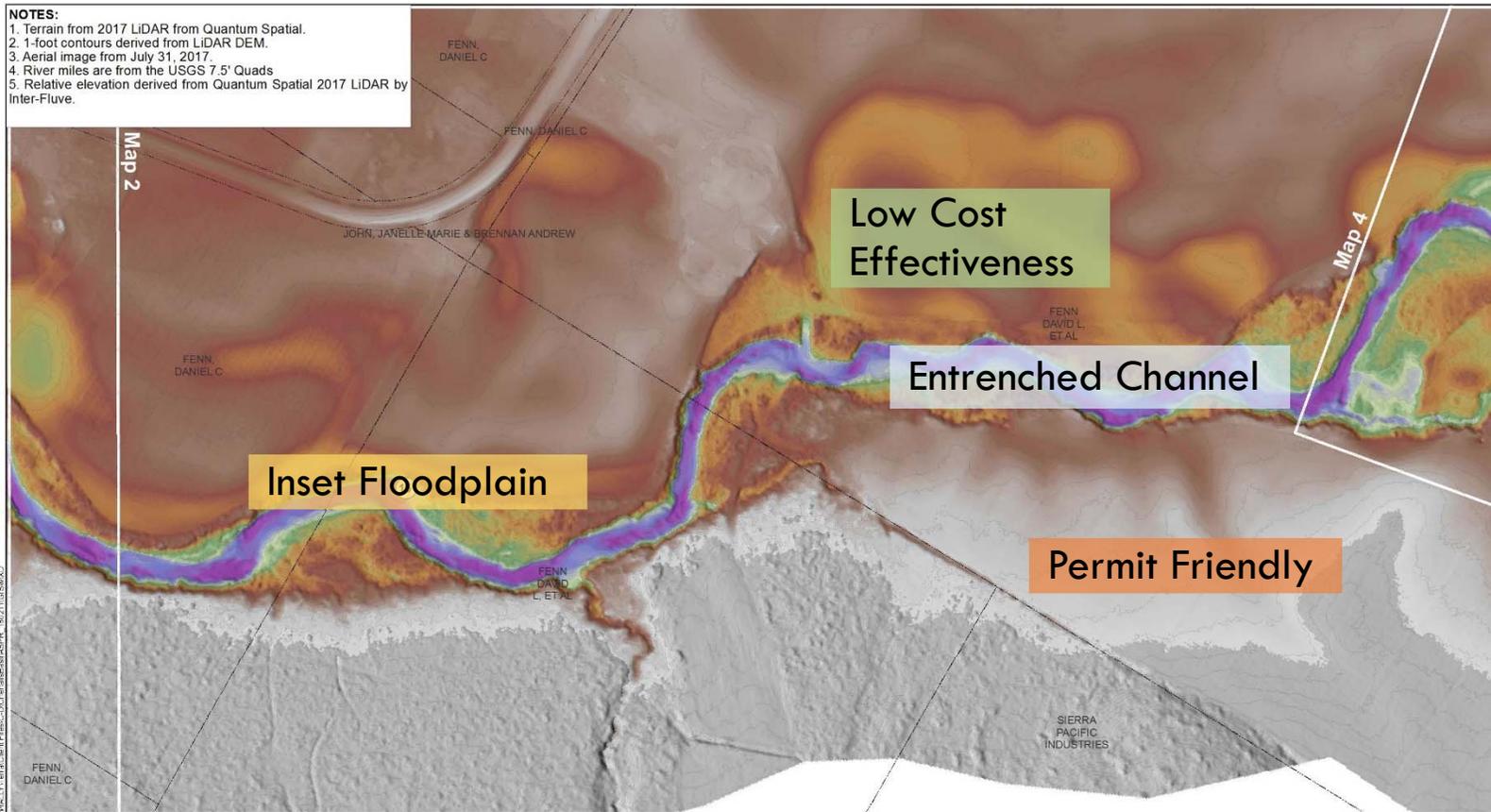
- Contours 1ft
- Map Matchlines
- Parcels
- River Miles

River Survey - Map 3 of 5

Early Action Reach RM: 13.5 to 16.5  
Middle South Fork Chehalis River, WA  
Chehalis Basin ASRP Design

# South Fork Chehalis | RM 13.5 – 16.5

## Relative Elevation Map



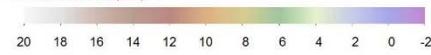
DRAFT



Projection: NAD 1983  
State Plane Washington South FIPS 4602



Relative Elevation (feet)



- Map Matchlines
- Parcels
- River Miles

River Survey - Map 3 of 5

Early Action Reach RM: 13.5 to 16.5  
Middle South Fork Chehalis River, WA  
Chehalis Basin ASRP Design

# South Fork Chehalis | RM 13.5 – 16.5

## Representative Photos



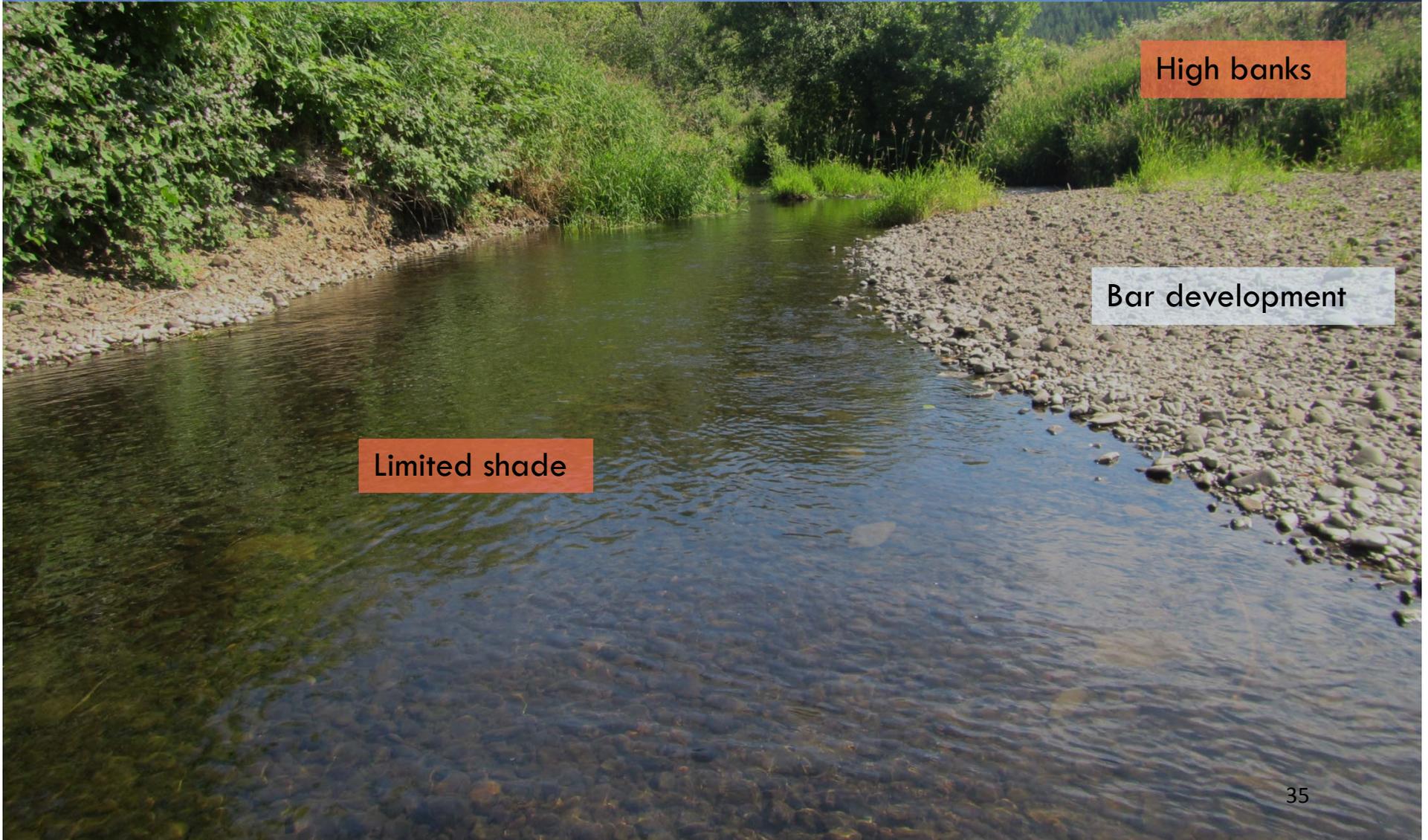
Sparse  
mature trees

Pools without  
cover

Channel  
entrenchment

# South Fork Chehalis | RM 13.5 – 16.5

## Representative Photos



High banks

Bar development

Limited shade

# South Fork Chehalis | RM 13.5 – 16.5

## Representative Photos

Limited riparian

High  
eroding  
banks

Bar development

# South Fork Chehalis | RM 13.5 – 16.5

## Representative Photos

A photograph of a large, weathered tree trunk with a yellow tag and a blue marker. The tree trunk is the central focus, showing deep vertical grooves and a rough, greyish-brown bark. A yellow tag is attached to the trunk on the right side, and a blue marker is visible below it. The tree is surrounded by green grass and some dry, brown grass in the foreground. The background is filled with dense green foliage.

What once was

Pasture corner

# South Fork Chehalis | RM 13.5 – 16.5

## Representative Photos



High banks

Bar  
development

Limited  
riparian

# South Fork Chehalis | RM 13.5 – 16.5

## Reach Summary

MSFC

RM13.5-16.5

### Criteria

Ecological Metrics

Incised channel & inset floodplain

Fish & Other Species Use

Salmon & Western Toad

Natural Process

Farm land, narrow buffers

Landowner Support

Large parcels

Risk & Public Safety

Bridges & roads

Permitting

Permittable, no wetland mitigation

Project Unit Cost

Low cost effectiveness

Summary

Big projects, high unit cost

# Newaukum Sub-Basin

## Reach Evaluation Summary

Criteria	RM10.9-13.0	RM 23.1-25.1
Ecological Metrics	Best	Good
Fish & Other Species Use	Good	Fair
Natural Process	Best	Fair
Landowner Support	Best	Fair
Risk & Public Safety	Best	Good
Permitting	Best	Fair
Project Unit Cost	Good	Fair
Summary	Best	Fair

# South Fork Chehalis Sub-Basin Reach Evaluation Summary

Criteria	MSFC RM 13.5-16.5	Stillman RM 0-2.5
Ecological Metrics	Fair	Good
Fish & Other Species Use	Fair	Fair
Natural Process	Fair	Good
Landowner Support	Good	Good
Risk & Public Safety	Fair	Good
Permitting	Good	Good
Project Unit Cost	Fair	Good
Summary	Fair	Good

# Ecological Metrics

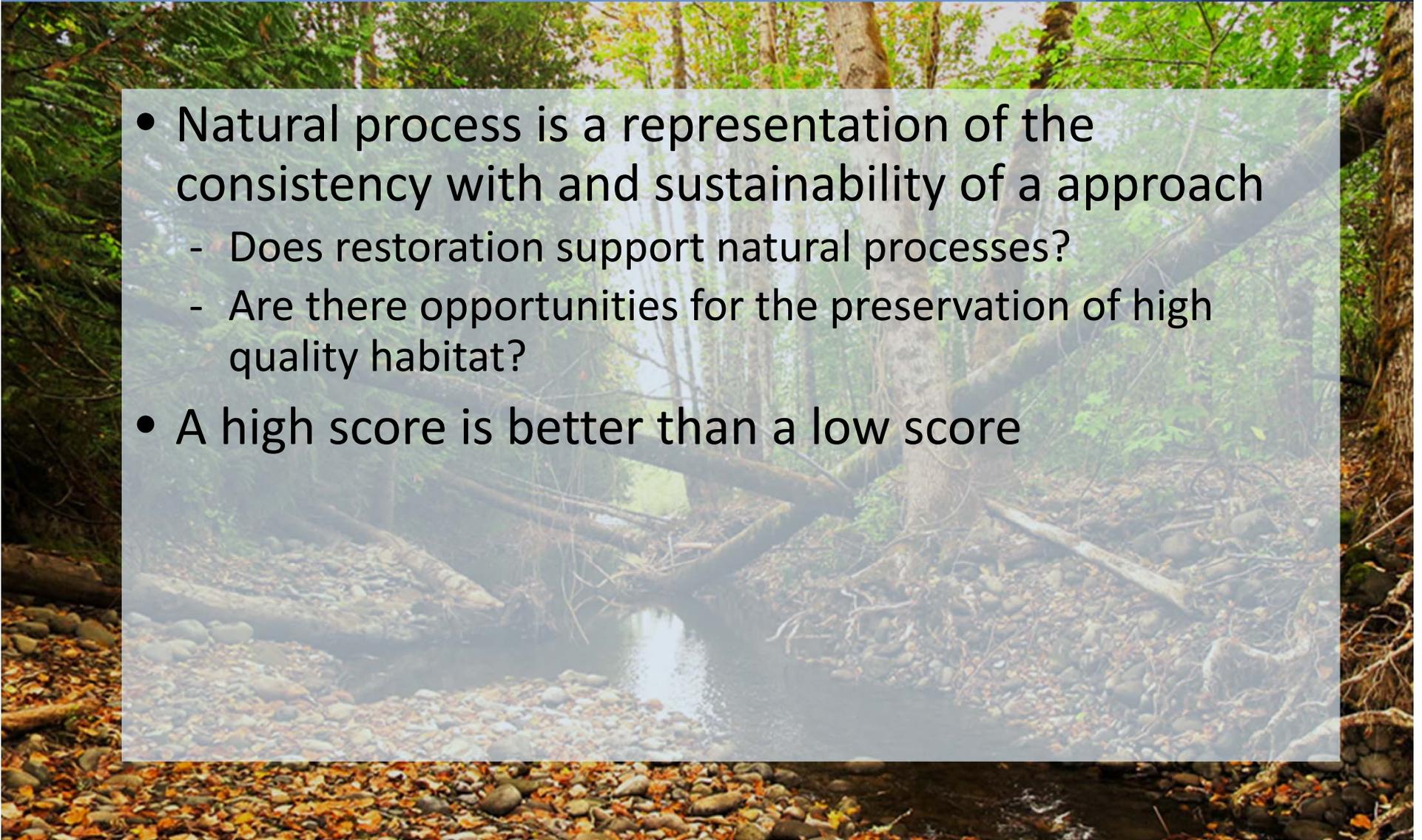
- Ecological metrics are a combination of a number of factors:
  - Side channels
  - Floodplain
  - Channel length
  - Wetlands
  - Riparian community
  - Wood structures
  - Pools
- A high score shows more ecological benefit than a low score

# Fish & Other Species Use

- Fish & other species use is a combination of a number of factors:
  - Steelhead (adult migration, spawning, rearing)
  - Fall Chinook (adult migration, spawning, rearing)
  - Spring Chinook (adult migration, spawning, rearing)
  - Coho (adult migration, spawning, rearing)
  - Chum (adult migration, spawning, rearing)
  - Other species (Western Toad, Coastal Tailed Frog, Oregon Spotted Frog, Van Dyke's Salamander, Northern Red-legged Frog, Western Ridge Mussel, Beaver)
- A high score shows more benefit to more numbers of species than a low score

# Natural Process

- Natural process is a representation of the consistency with and sustainability of a approach
  - Does restoration support natural processes?
  - Are there opportunities for the preservation of high quality habitat?
- A high score is better than a low score



# Landowner Support

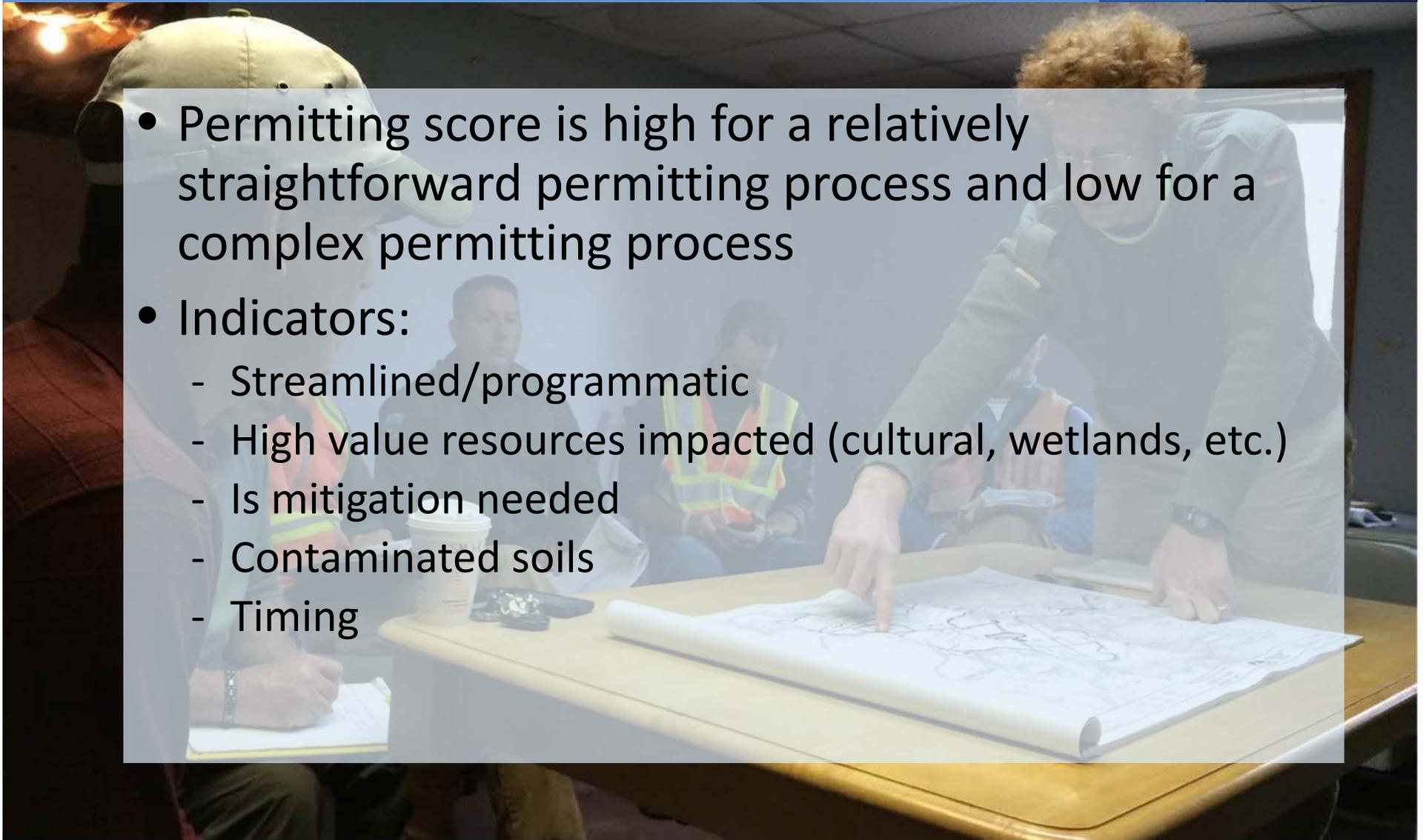
- Landowner support is a combination of a number of factors:
  - Number of landowners per mile
  - Willingness (if known)
  - Public landownership
  - Active use? (e.g. ag, residential, forest)
  - Percent of area within willing landowners
- A high score shows more support by landowners than a low score

# Risk & Public Safety

- Risk & Public Safety score is high for low levels of risk and public safety concerns:
  - Arterial roads in floodplain channel migration zone
  - Bridges in or downstream of reach
  - Utilities
  - Houses/structures
  - Levees (flood protection)
  - Recreation (public safety)
- The score is low for high levels of risk and public safety concerns

# Permitting

- Permitting score is high for a relatively straightforward permitting process and low for a complex permitting process
- Indicators:
  - Streamlined/programmatic
  - High value resources impacted (cultural, wetlands, etc.)
  - Is mitigation needed
  - Contaminated soils
  - Timing



# Project Unit Cost

- Project costs are by unit (area, length, etc.) to normalize for large simple projects compared to small complex projects that may have similar total costs
- A high score is better than a low score

