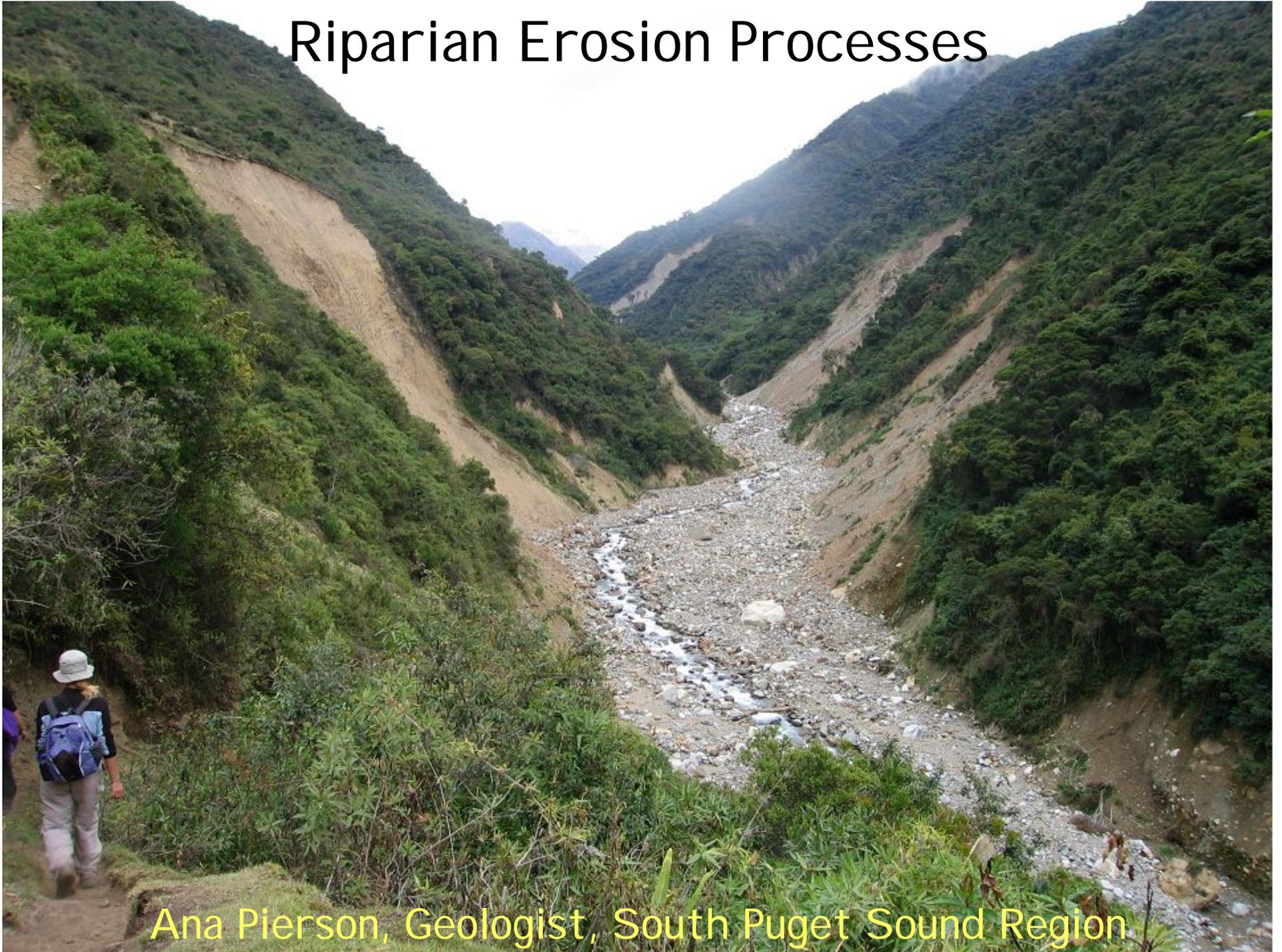


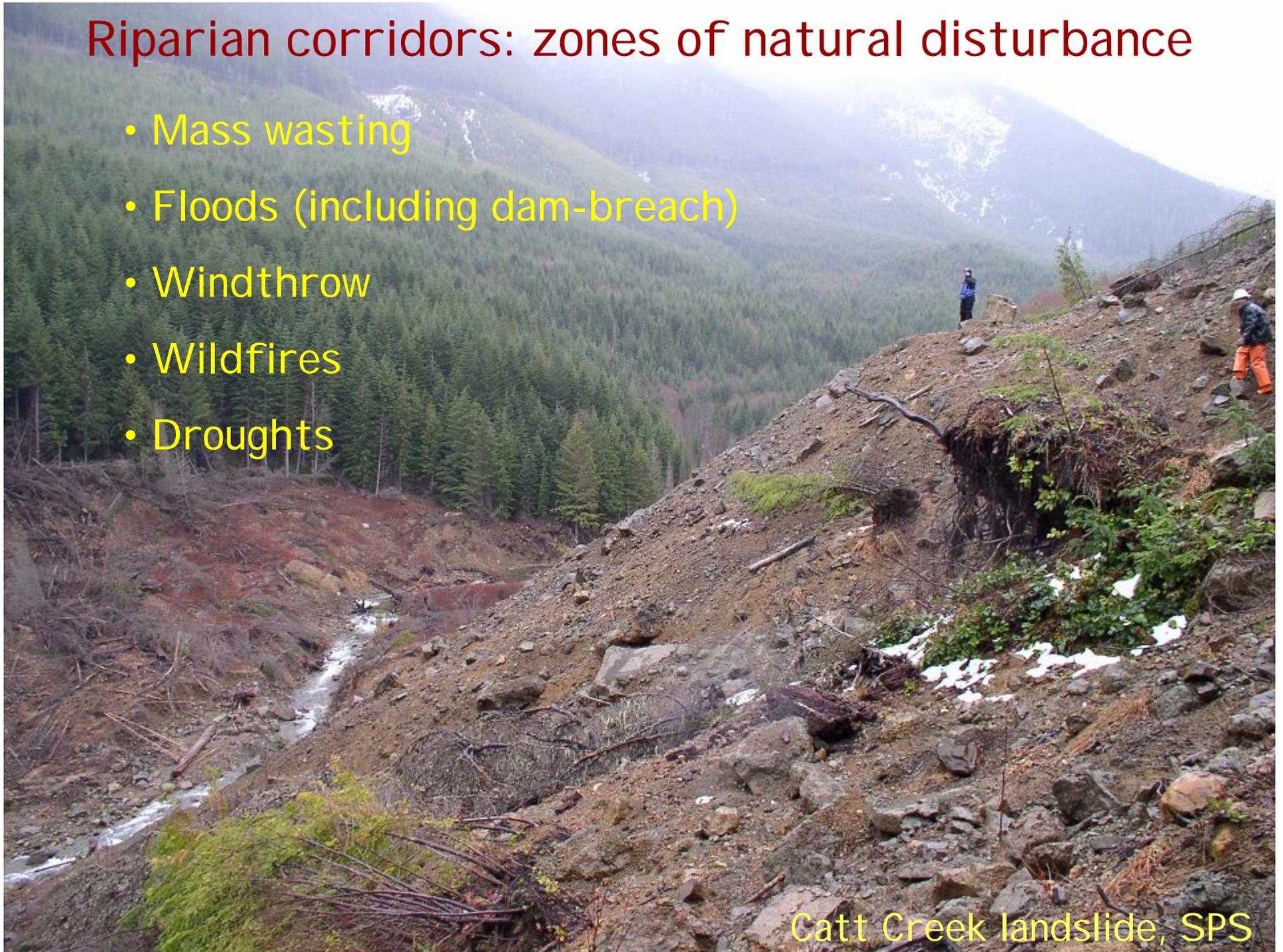
Riparian Erosion Processes



Ana Pierson, Geologist, South Puget Sound Region

Riparian corridors: zones of natural disturbance

- Mass wasting
- Floods (including dam-breach)
- Windthrow
- Wildfires
- Droughts

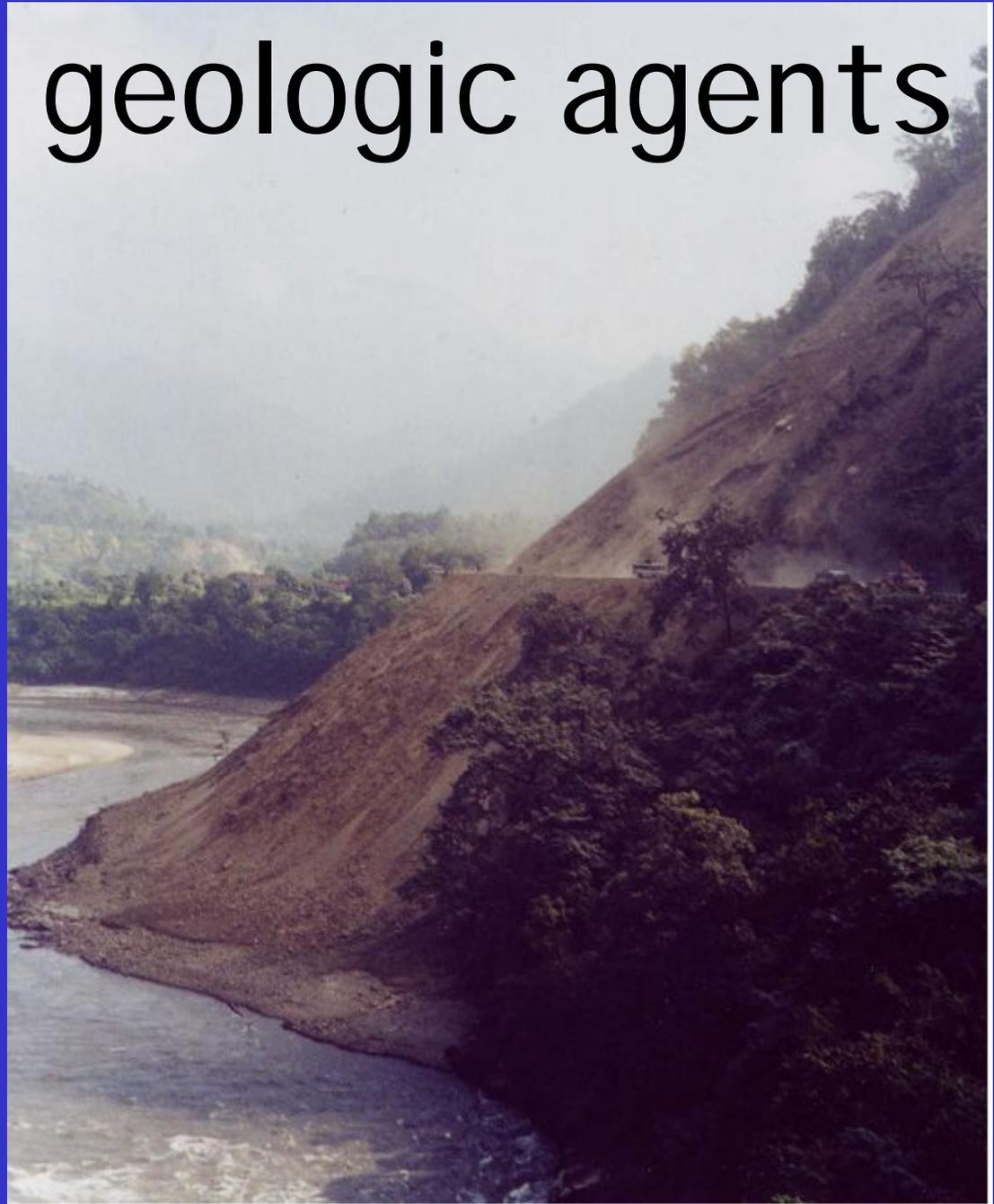


Catt Creek landslide, SPS

Humans as geologic agents

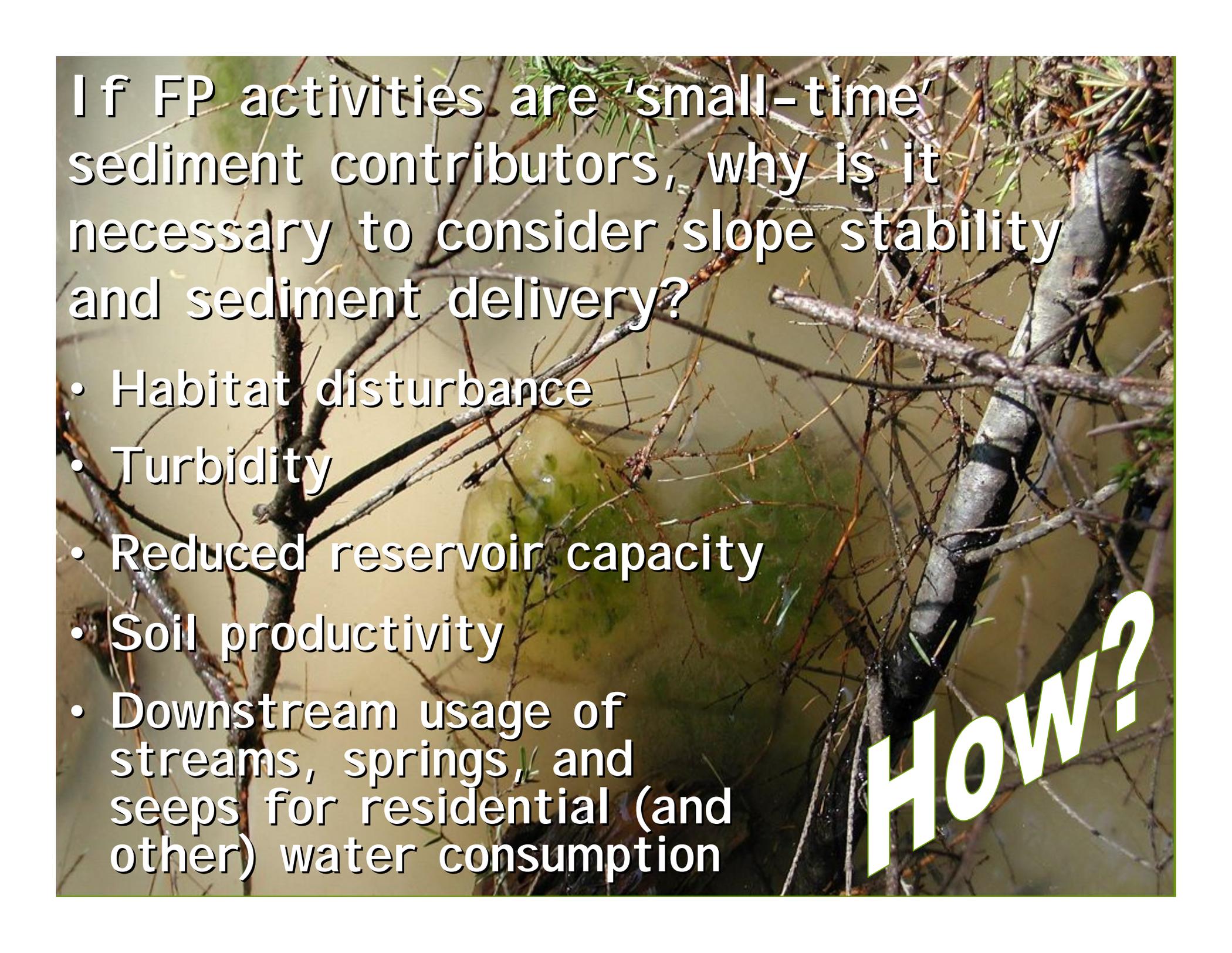
Humans are responsible for moving an order of magnitude more sediment than are all natural processes combined

(Wilkinson, 2005)



Who are the big-time players in sediment transport?

- Construction
- Agriculture

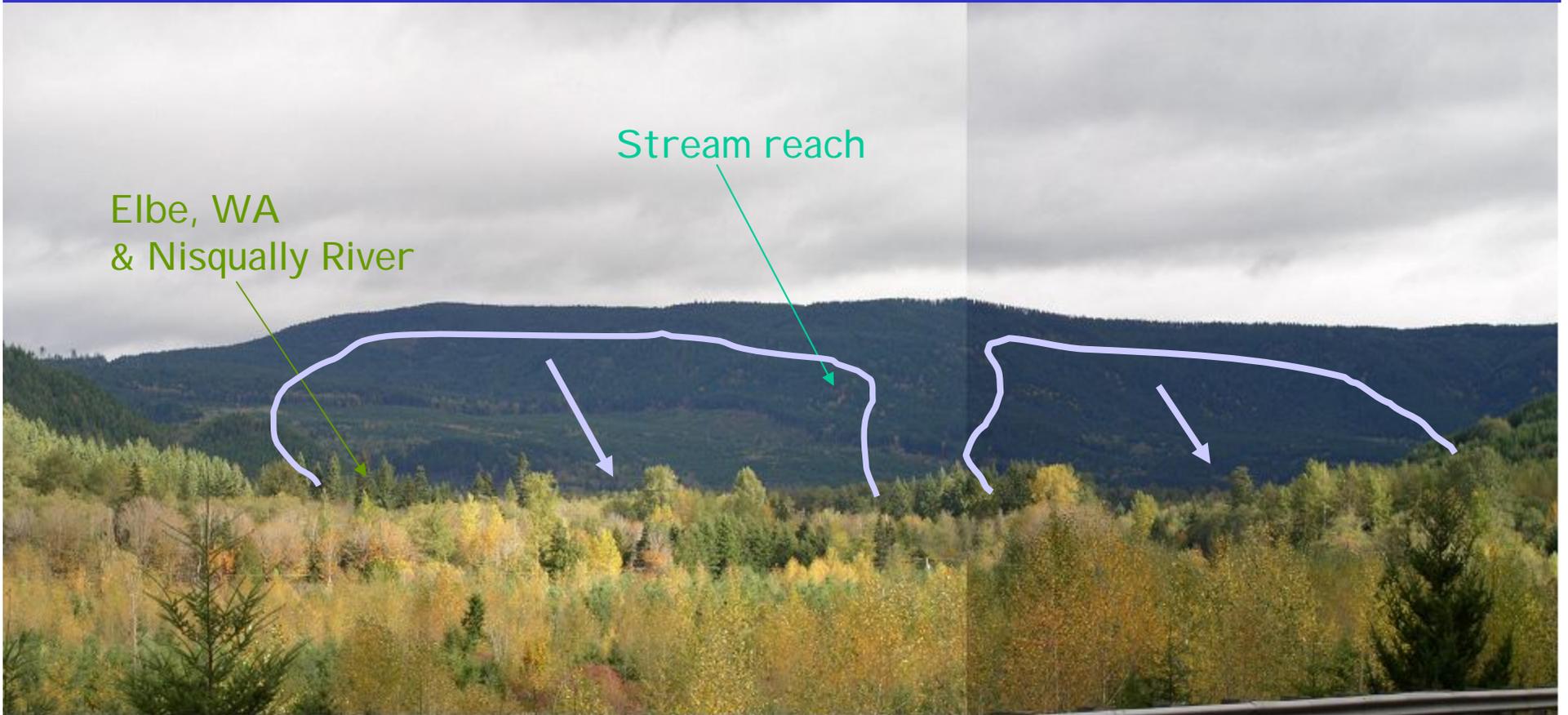
A photograph of a stream with a tree branch in the foreground and a large green algal bloom in the water. The text is overlaid on the image.

If FP activities are 'small-time' sediment contributors, why is it necessary to consider slope stability and sediment delivery?

- Habitat disturbance
- Turbidity
- Reduced reservoir capacity
- Soil productivity
- Downstream usage of streams, springs, and seeps for residential (and other) water consumption

How?

Big Picture Approach



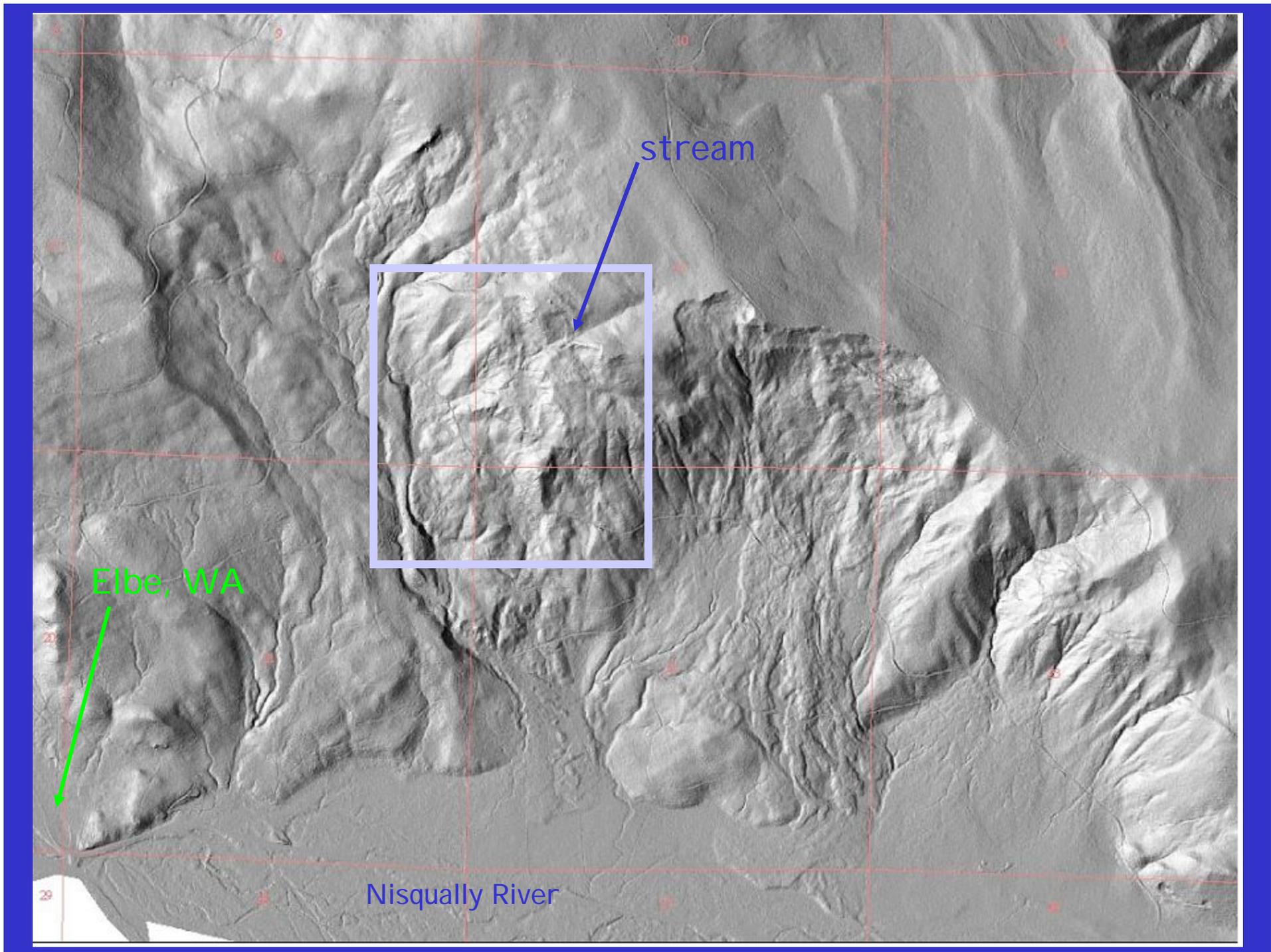
Watershed to reach—zoom out *then* zoom back in

Consider the reach within the watershed as a whole

- SEPA obligations

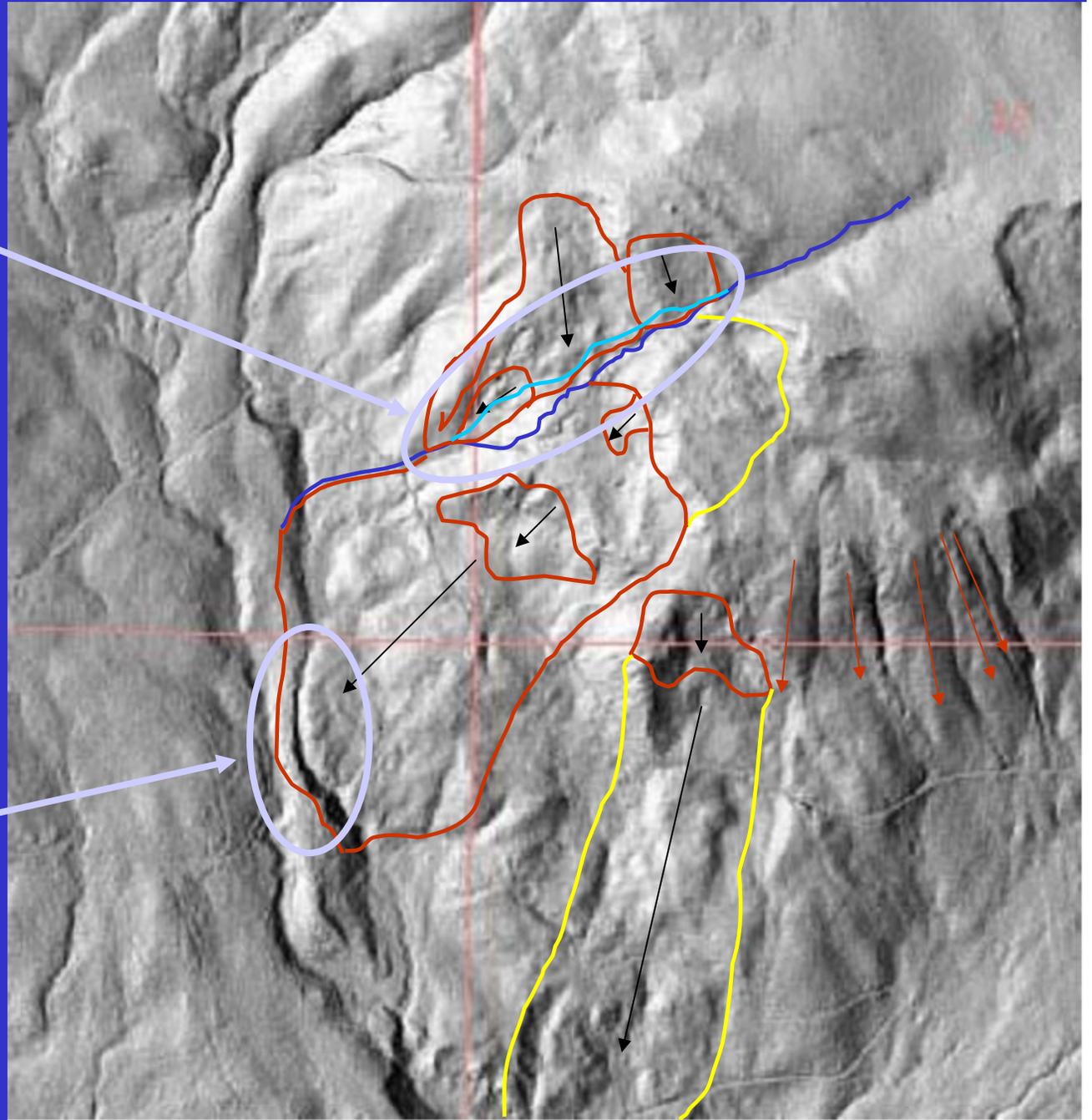
Consider the landslide history

- watershed analysis
- LHZ
- geologist



Stream channel likely re-routed due to landslide activity

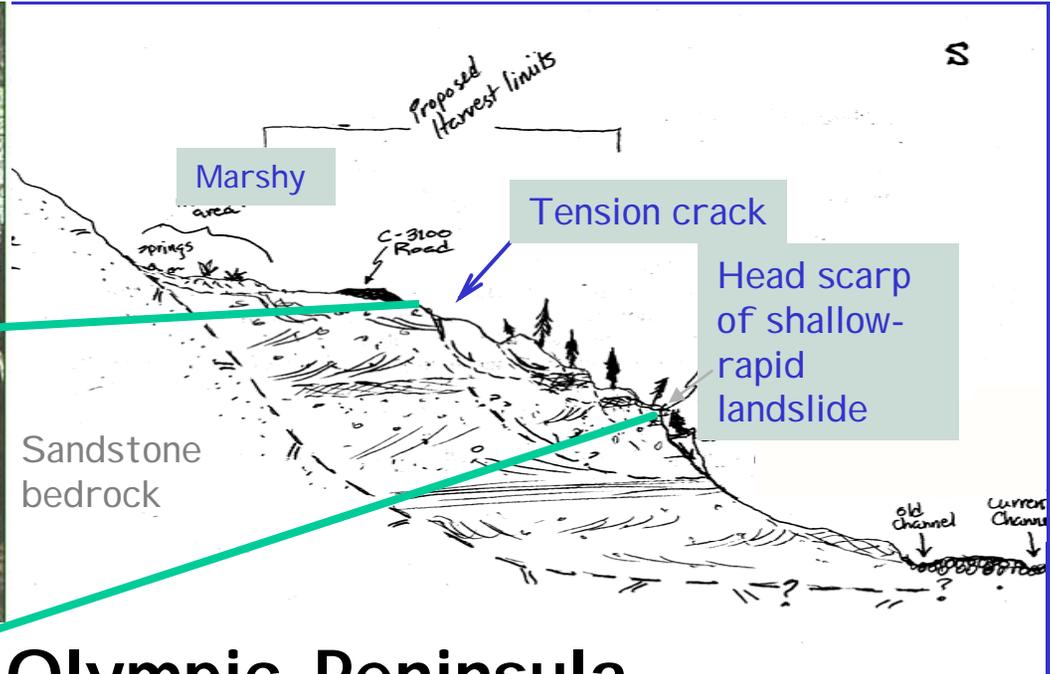
Stream channel likely forced westward due to landslide activity



Thurston Co.



Are you proposing management activity on a larger, unstable landform?



Olympic Peninsula Stequaleho Creek

Will your proposed management activity adversely impact slope stability?

Identifying unstable slopes: What resources are available to you?

- Planning and Tracking
- SMORPH (topography, slope shape)
- GIS - landslide inventories
- Watershed Analysis
- Landslide Hazard Zonation (LHZ)
- LiDAR, other
- Air Photos (stereo)
- Ortho-photos
- Anecdotal - History
- Forest Practices Slope Stability Training
- Geologist

Aerial Photos & Orthophotos

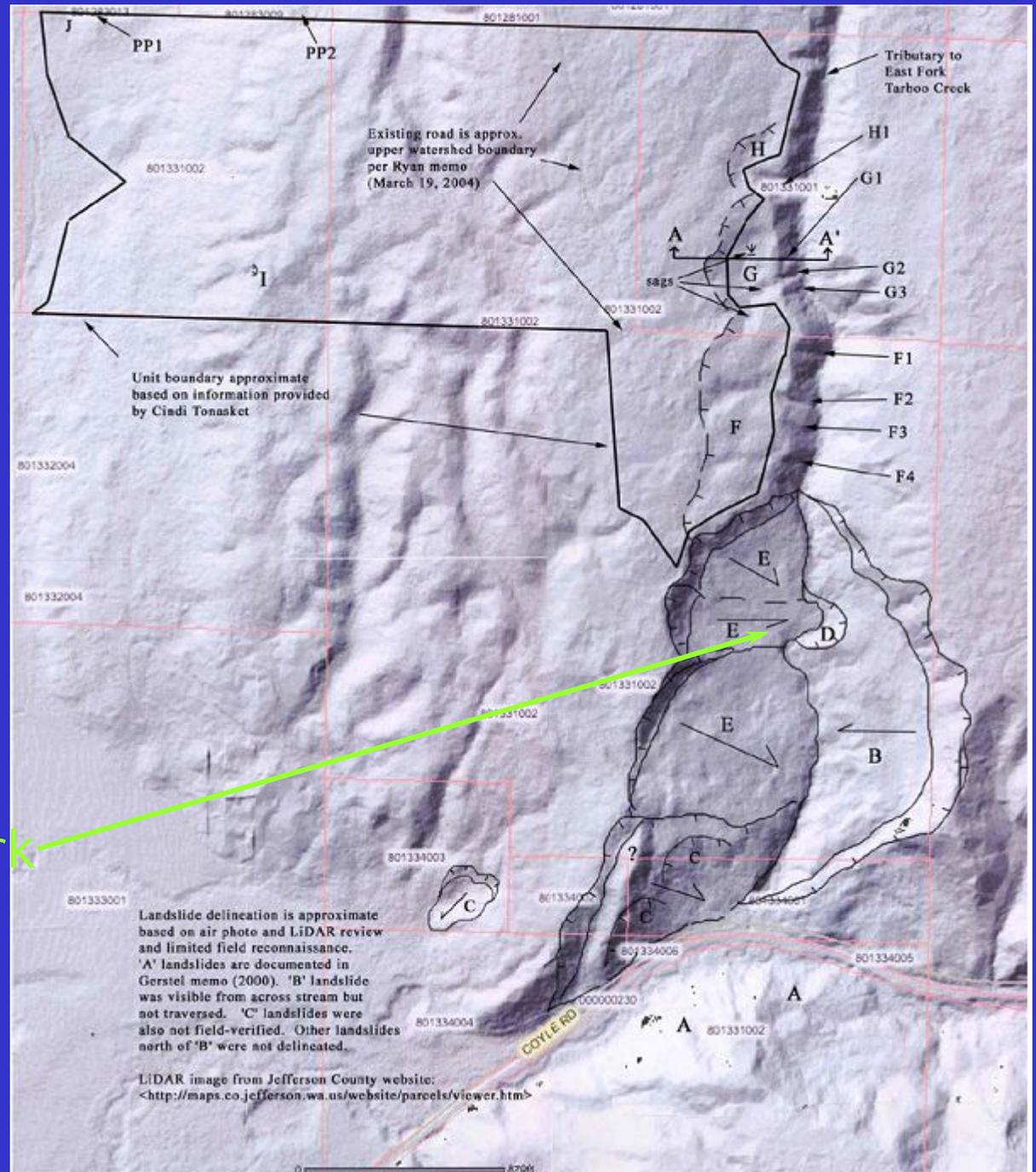
Tributary to East Fork
Tarboo Creek



Olympic Region

LiDAR

Tributary to East Fork
Tarboo Creek



Olympic Region

What are the indicators of potentially unstable slopes?
... and ... Where is riparian management unsuitable?





Northwest Region



Slump

Block

Stream Channel



Water-perching
Dense silts

Woodbury, British Columbia

Debris flow crossed
forest, provincial road,
rail road, and deposited
sediment and LWD into
lake.

Is the riparian management proposal productive or counterproductive to the goals and objectives of RFRS?

- Potential impacts of management activity in the riparian area



Consider:

-Buffer integrity

Width

Root strength

Wind-throw
resistance



-Surface and
groundwater
interception,
routing



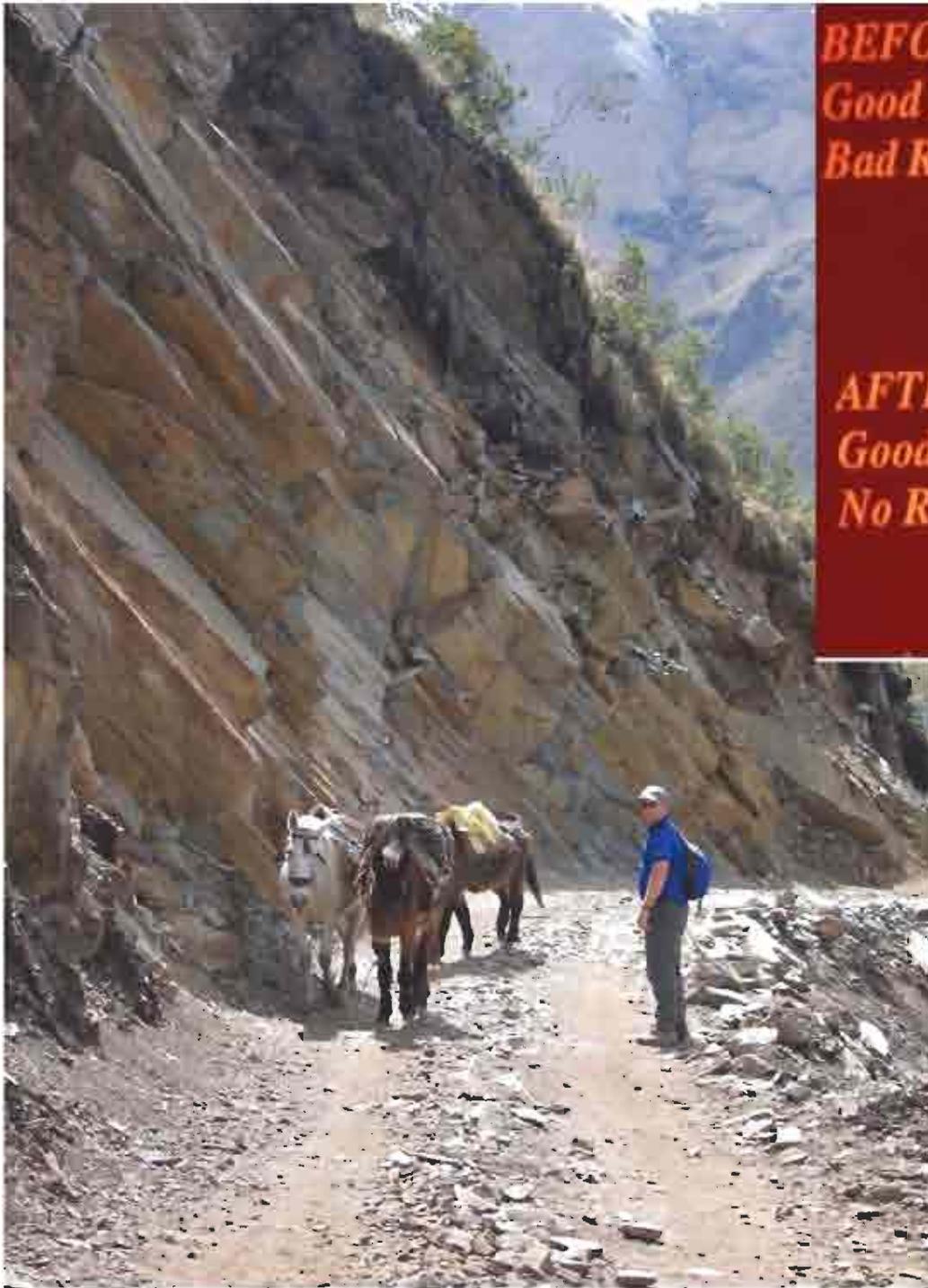
BEFORE:
Good Road on Left
Bad Road on Right

**NEW ROAD
UNDERCUTS
LAYERS**



AFTER:
Good Road on Left
No Road on Right

LANDSLIDE





Roads:

density
 cut/fill slope height
 and gradient
 water routing
 ravel potential
 ditch blockage
 material wasting
 geologic structure



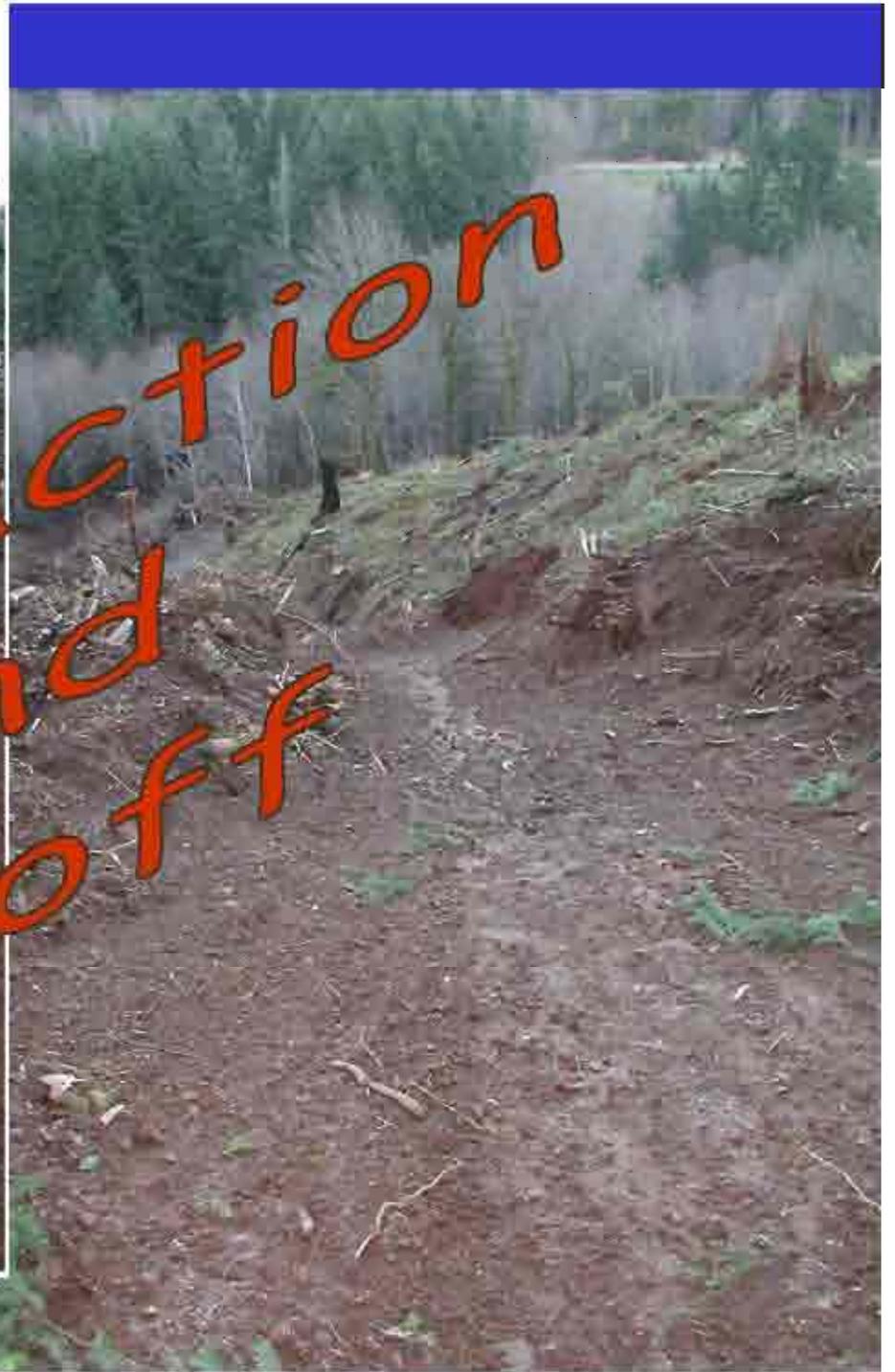
Harvest:

Corridor/landing
 locations
 lift/deflection
 soil types/landforms





compaction
and
runoff



Dry-Season Harvest

Skid roads



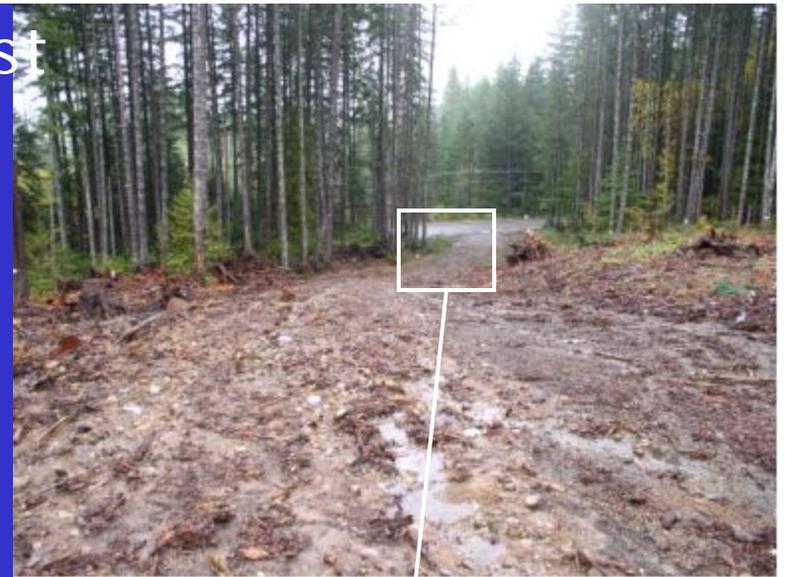
Type-5 stream

How will these respond in the wet season?

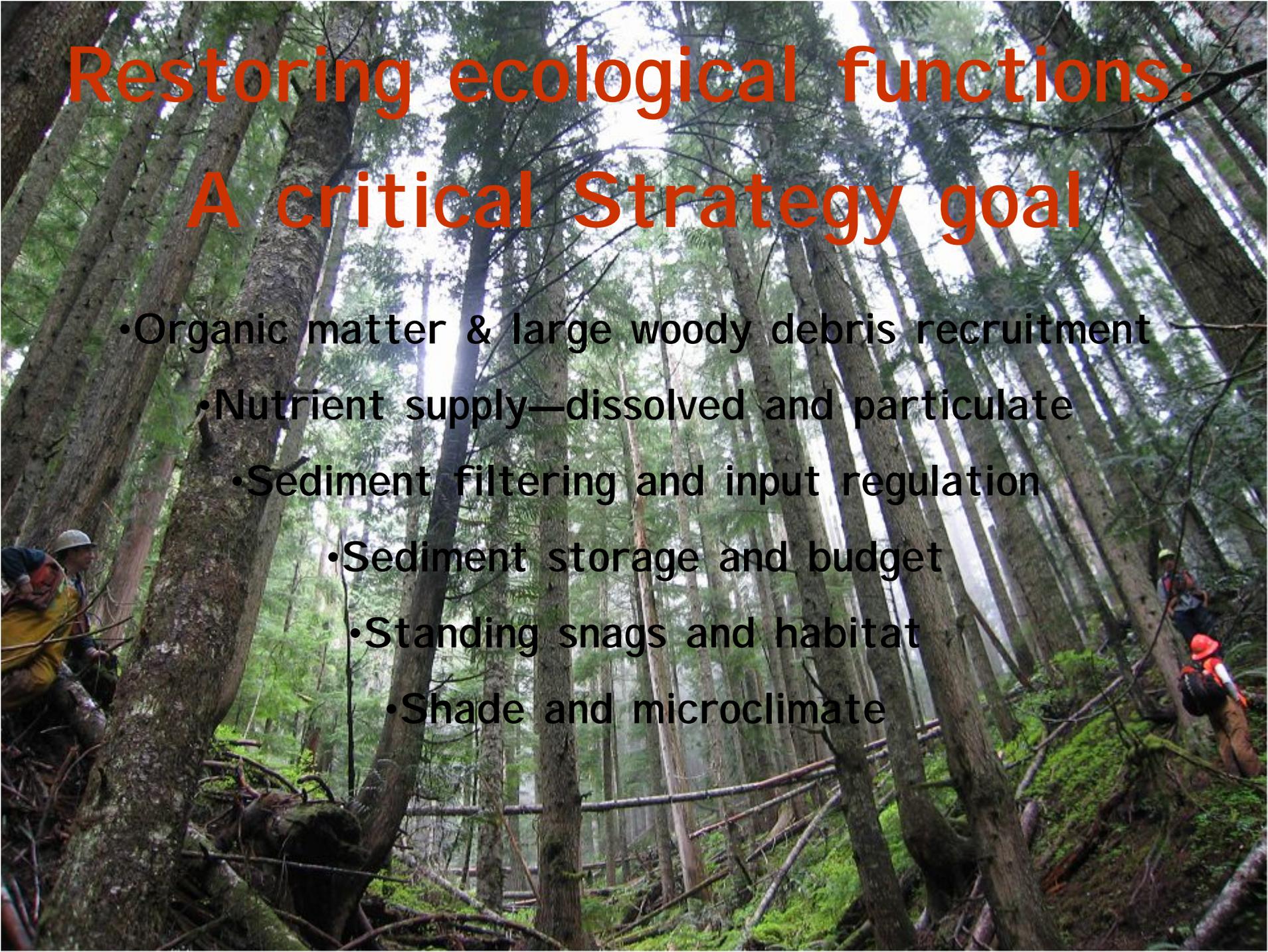
Same sale: winter, post-timber harvest



Suspended sediment
in type-5 stream
downslope of unit



Sediment-laden runoff
from skid roads



Restoring ecological functions: A critical Strategy goal

- Organic matter & large woody debris recruitment
 - Nutrient supply—dissolved and particulate
 - Sediment filtering and input regulation
 - Sediment storage and budget
 - Standing snags and habitat
 - Shade and microclimate

Questions?

