Caspar Creek Experimental Watersheds Phase III:

Canopy reduction effects on watershed biogeochemical processes

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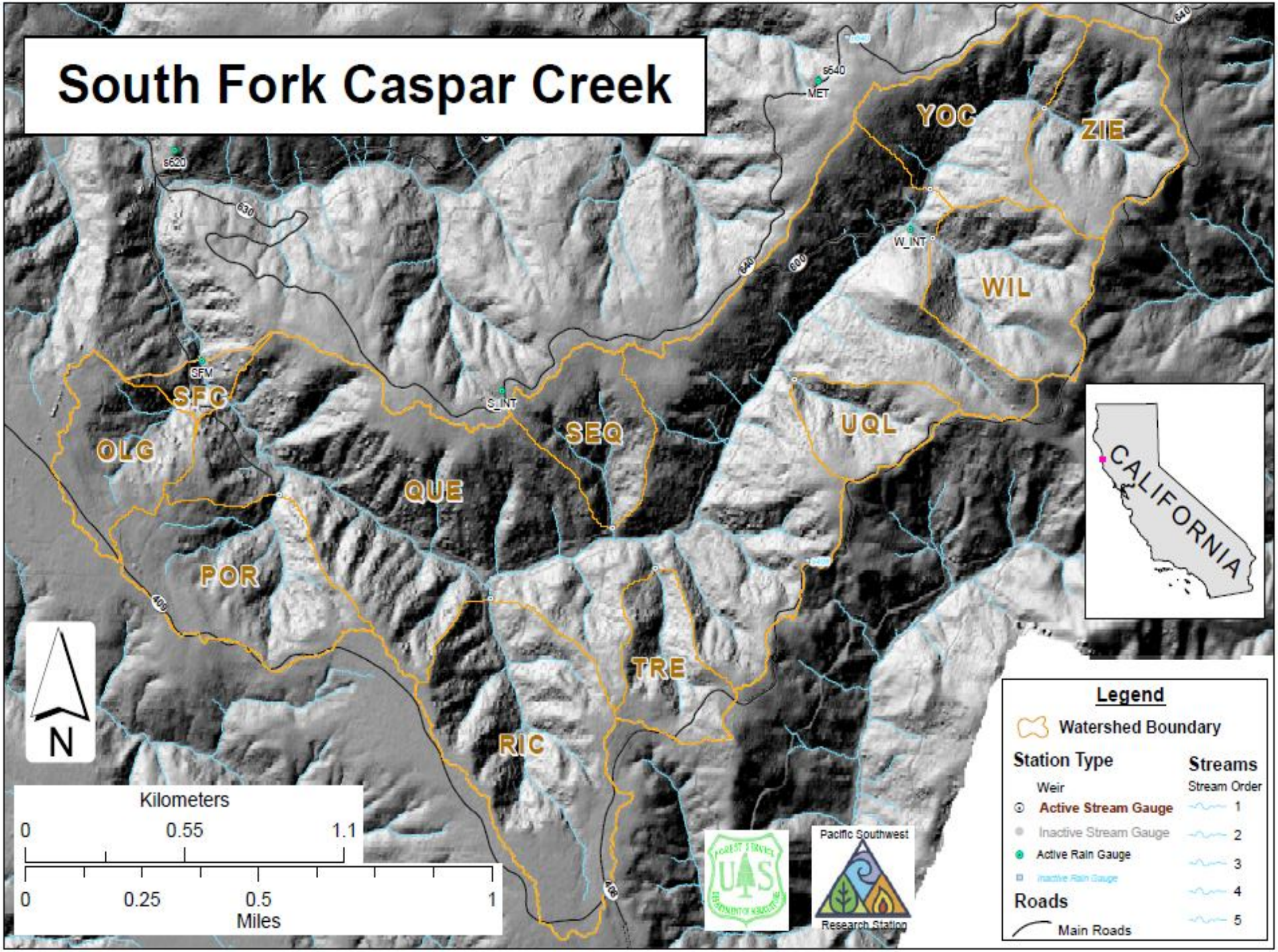
CA Aquatic Bioassessment Workgroup Annual Meeting

October 20, 2015


South Fork Caspar Creek
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Miles
Pacific Southwest
Research Station
Legend
Watershed Boundary
Station Type
Weir
Active Stream Gauge
Inactive Stream Gauge
Active Rain Gauge
Roads
Main Roads
Streams
Stream Order
1
2
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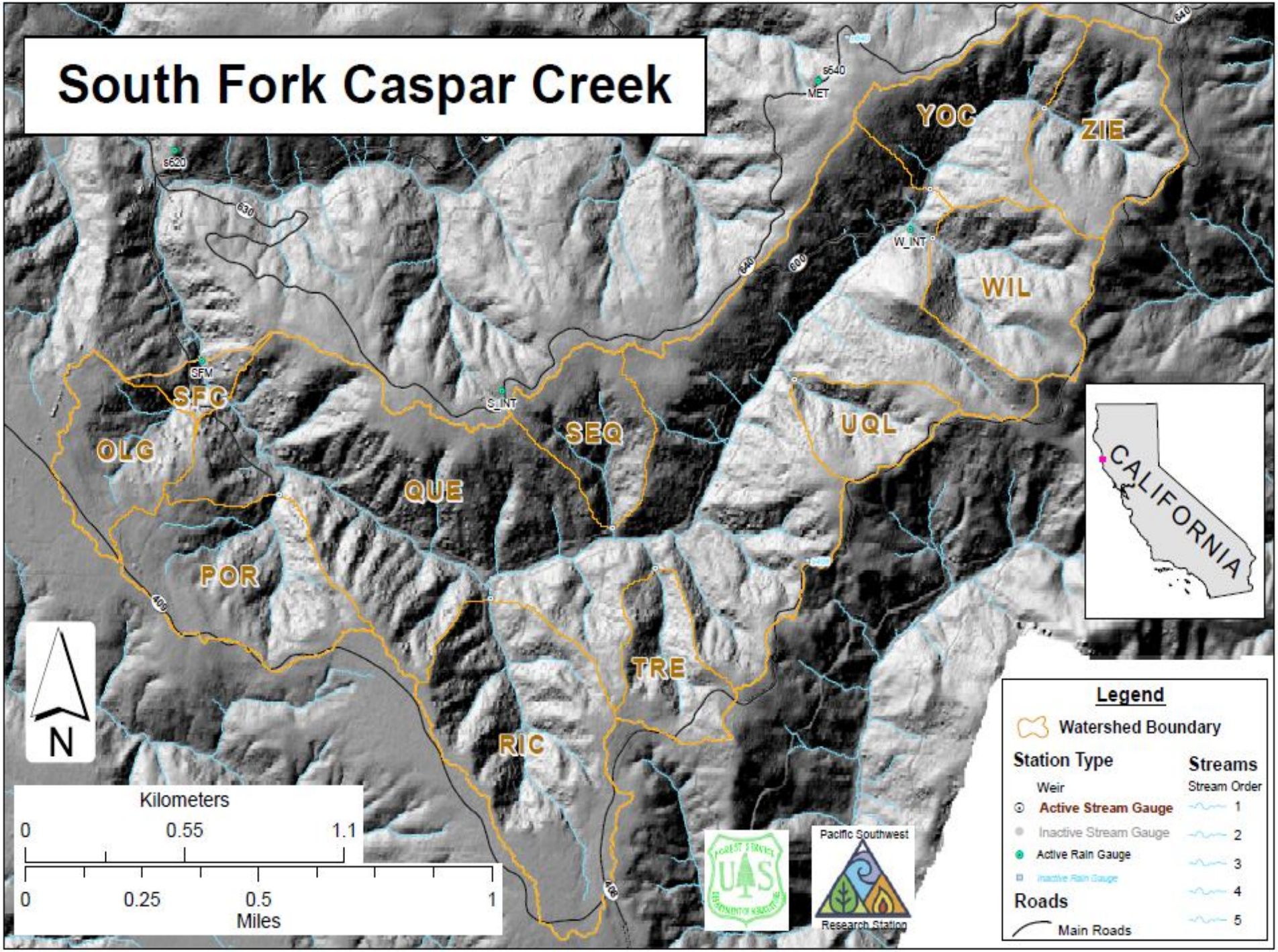
4
5

South Fork Caspar Creek Sub-watersheds

WS Name	WS ID	Area (ha)	Elevation Range (m)	Average Slope (%)	Dominant Soil Subgroup(s)
South Fork Caspar	SFC	424	46-329	59.6	Ultic hapludalf
Ogilvie	OGI	18	58-174	26.3	Mollic/Ultic hapludalf
Porter	POR	32	61-186	34.2	Ultic hapludalf
Quetelet	QUE	394	48-329	49.8	Mollic/Ultic hapludalf
Richards	RIC	49	73-198	41.6	Mollic/Ultic hapludalf
Sequoyah	SEQ	17	79-207	37.9	Ultic hapludalf
Treat	TRE	14	98-244	46.5	Mollic/Ultic hapludalf
Uqlidisi	UQL	13	122-323	48.5	Typic haplohumult
Williams	WIL	26	146-323	50.5	Typic haplohumult
Yocom	YOK	53	146-329	47.5	Typic haplohumult
Ziemer	ZIE	25	213-329	43.0	Typic haplohumult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1st and 2nd Experiments

- Looked at influence of forest harvesting and roads on streamflow, sediment, and fisheries.
- Quantified the cumulative watershed effects of logging on streamflow and sediment across space and time.
- Landscape-level effects.

Overarching Goal of 3rd Experiment

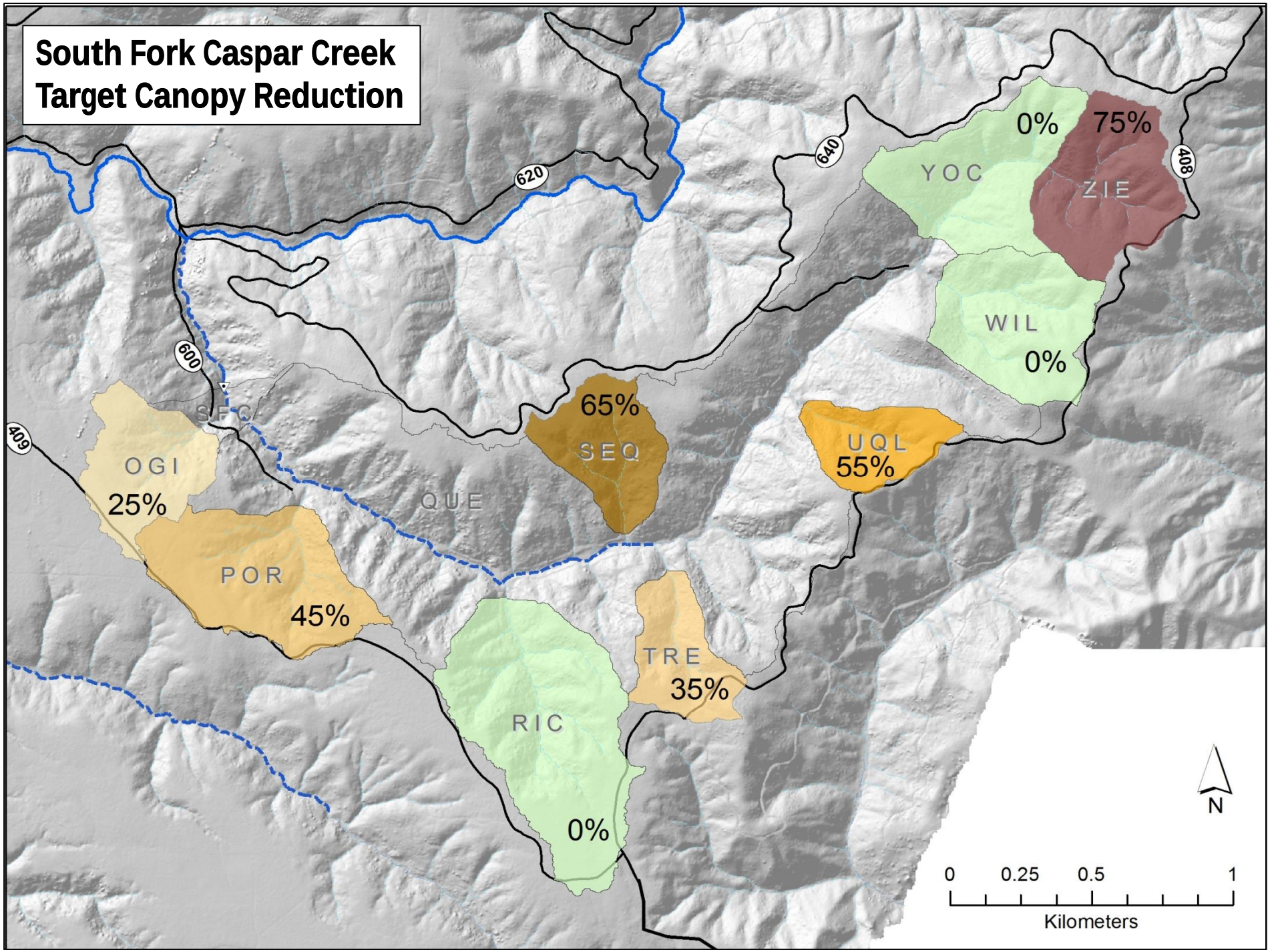
To investigate the effects of canopy reduction on biological, physical, and chemical watershed processes in the South Fork Caspar Creek

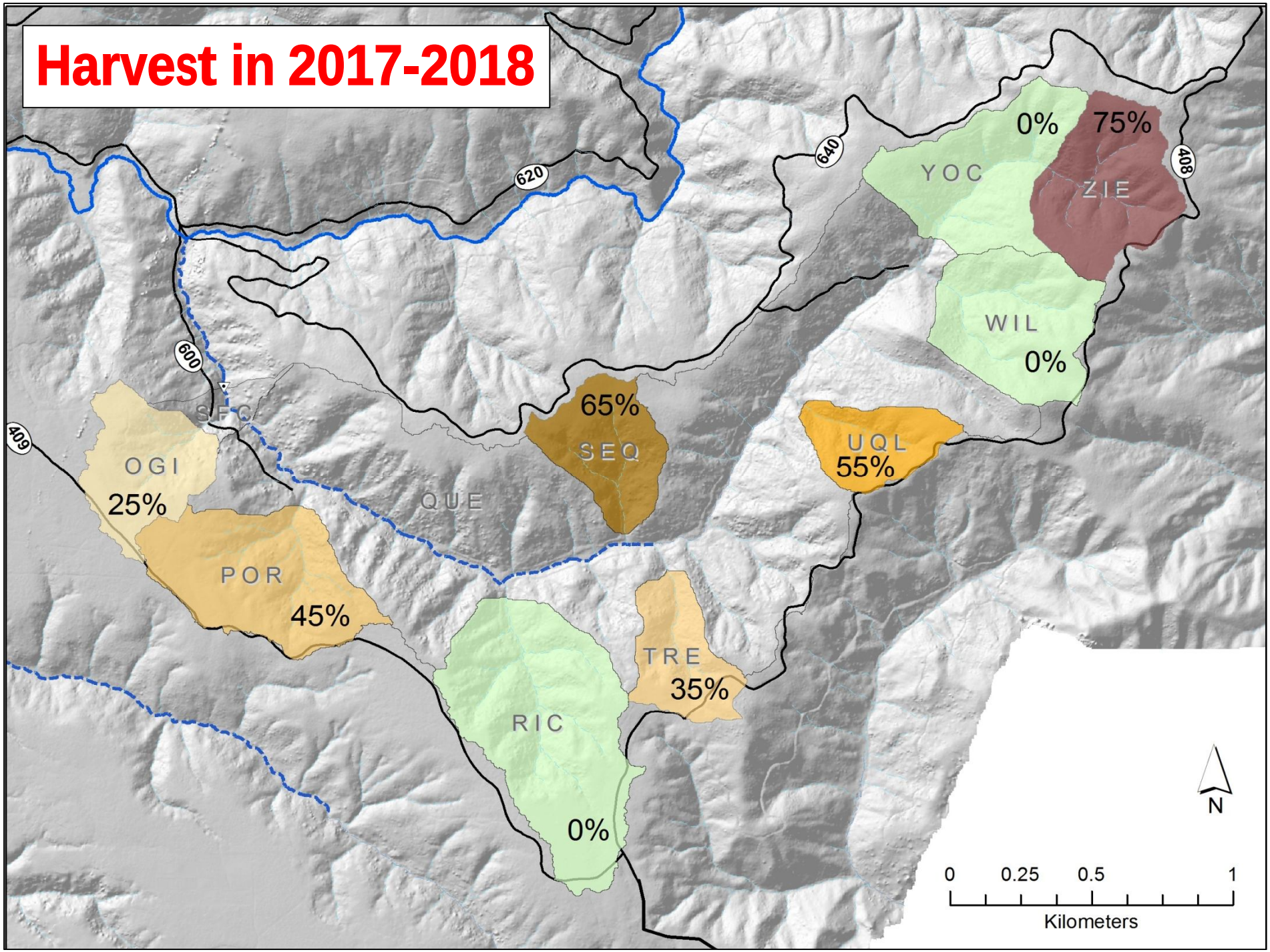
Let there be light!

Canopy Reduction Study Design

Regression-based design →
Identify response thresholds

WS Name	WS ID	Area (ha)	Target Canopy Reduction (%)
South Fork Caspar*	SFC	424	-
Ogilvie	OGI	18	25
Porter	POR	32	45
Quetelet*	QUE	394	35
Richards	RIC	49	0
Sequoyah	SEQ	17	65
Treat	TRE	14	35
Uqlidisi	UQL	13	55
Williams	WIL	26	0
Yocom*	YOK	53	0
Ziemer	ZIE	25	75


South Fork Caspar Creek
Target Canopy Reduction
620
640
408
600
409
YOC
0%
75%
ZIE
WIL
0%
65%
SEQ
UQL
55%
SFC
OGI
25%
QUE
POR
45%
TRE
35%
RIC
0%
N
0
0.25
0.5
1
Kilometers


Harvest in 2017-2018
620
640
408
600
409
YOC
0%
ZIE
75%
WIL
0%
SEC
65%
SEQ
UQL
55%
OGI
25%
QUE
POR
45%
TRE
35%
RIC
0%
N
0
0.25
0.5
1
Kilometers

Long-term Effects Study

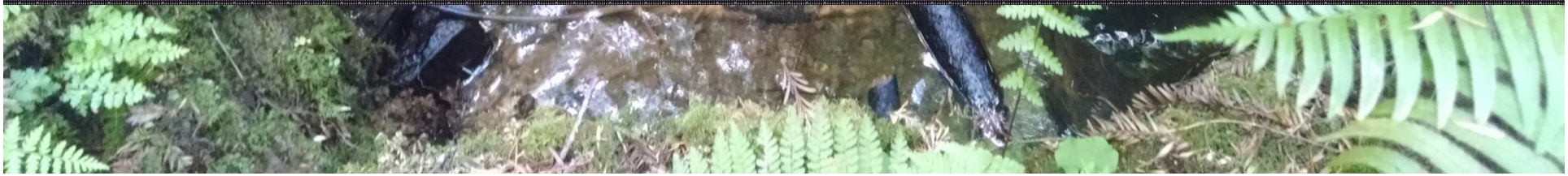
What are the immediate and long-term impacts of canopy reduction on streamflow and sediments?

Plant-water Use Studies

What is the role of canopy reduction in partitioning precipitation and fog into evapotranspiration, soil moisture, groundwater, and stream discharge?

Plant-water Use Studies

How does reducing forest canopy influence both the delivery of water from hillslopes to streams and source water of residual trees?



Sediment Fingerprinting Study

What are the sources of stream channel sediments and how does canopy reduction influence these sources?

And Many More!

- Channel Migration
- Ecosystem Resilience
- Economic/Ecological Cost-Benefit Analysis

Aquatic Bioassessment Study

Collect macroinvertebrate and stream nutrient data to understand the level in which forest harvesting influences riparian ecosystem function

SWAMP
Surface Water Ambient Monitoring Program

Contact/Questions?

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