

# *Geohazard Hiking on Cougar Mountain - Keeping Sane in COVID Times*

Tom Doe  
Golder Associates  
Redmond



AEG Puget Sound Chapter  
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# Acknowledgments

- Tim Walsh, Washington Geological Survey (next month's speaker)
- Manique Talaia Murray (UW-Message & WSP)
- Jim Johnson (Golder)
- Paula Doe
- Mark Norelius (family facilitated land conservation and trails above Vasa Park strand of Seattle Fault)
- Washington DNR for their fantastic geology and lidar portals!
- Newcastle Historical Society and Issaquah Alps Trails Club for preserving land and promoting appreciation of coal mining history



Excellent source books for mining and hiking.



## *The Coals of Newcastle*

*A Hundred Years of Hidden History*

2020 EDITION

NEWCASTLE HISTORICAL SOCIETY

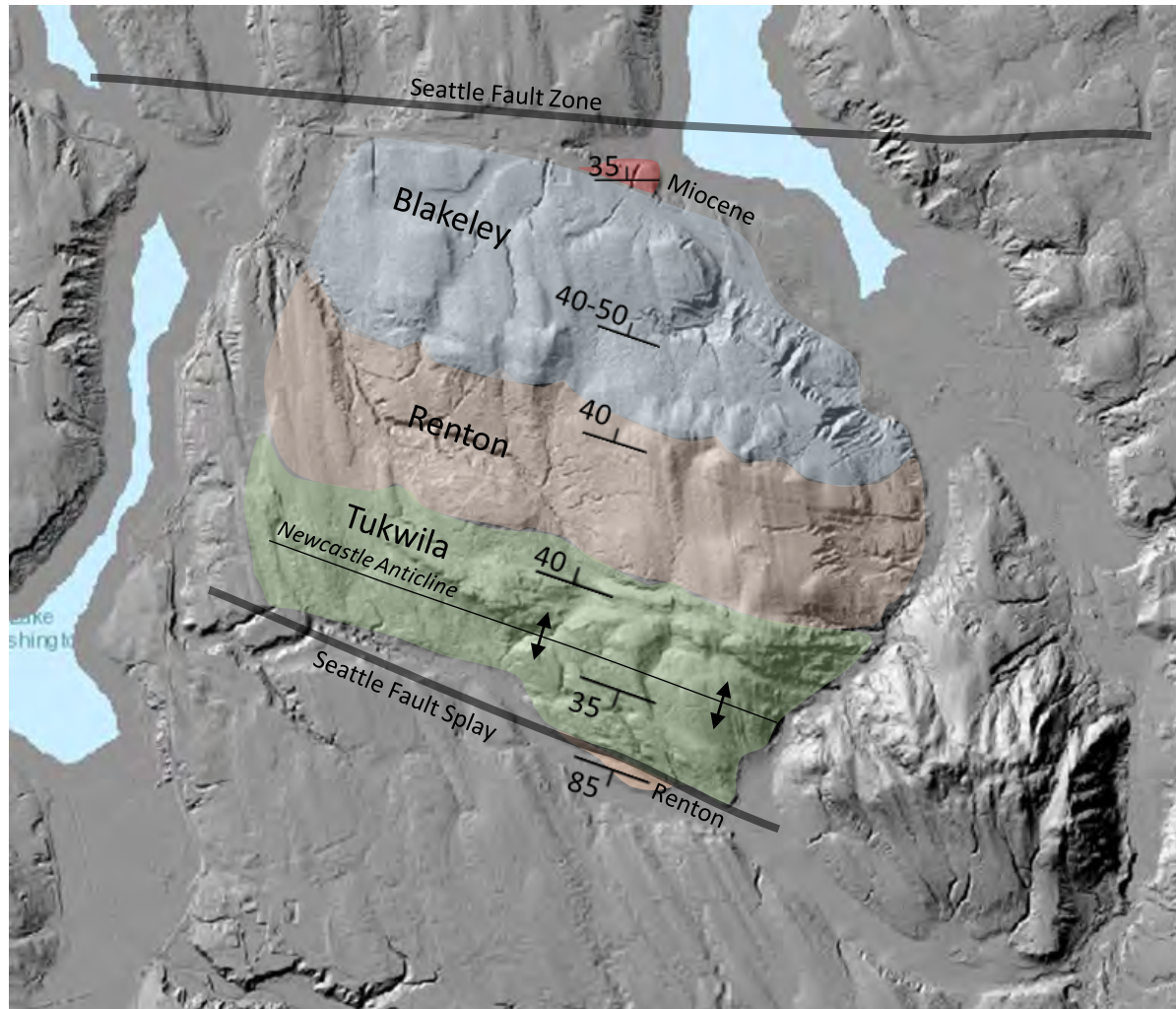


## 14 SHORTER TRAIL WALKS IN AND AROUND NEWCASTLE

BY  
EVA LUNDAHL  
IN COLLABORATION WITH NEWCASTLE TRAILS



# Simplified Cougar Mountain Geologic Map



**Miocene:** Sandstones and volcanic ash

**Blakeley:** Oligocene shallow marine sandstone and siltstone with marine fossils

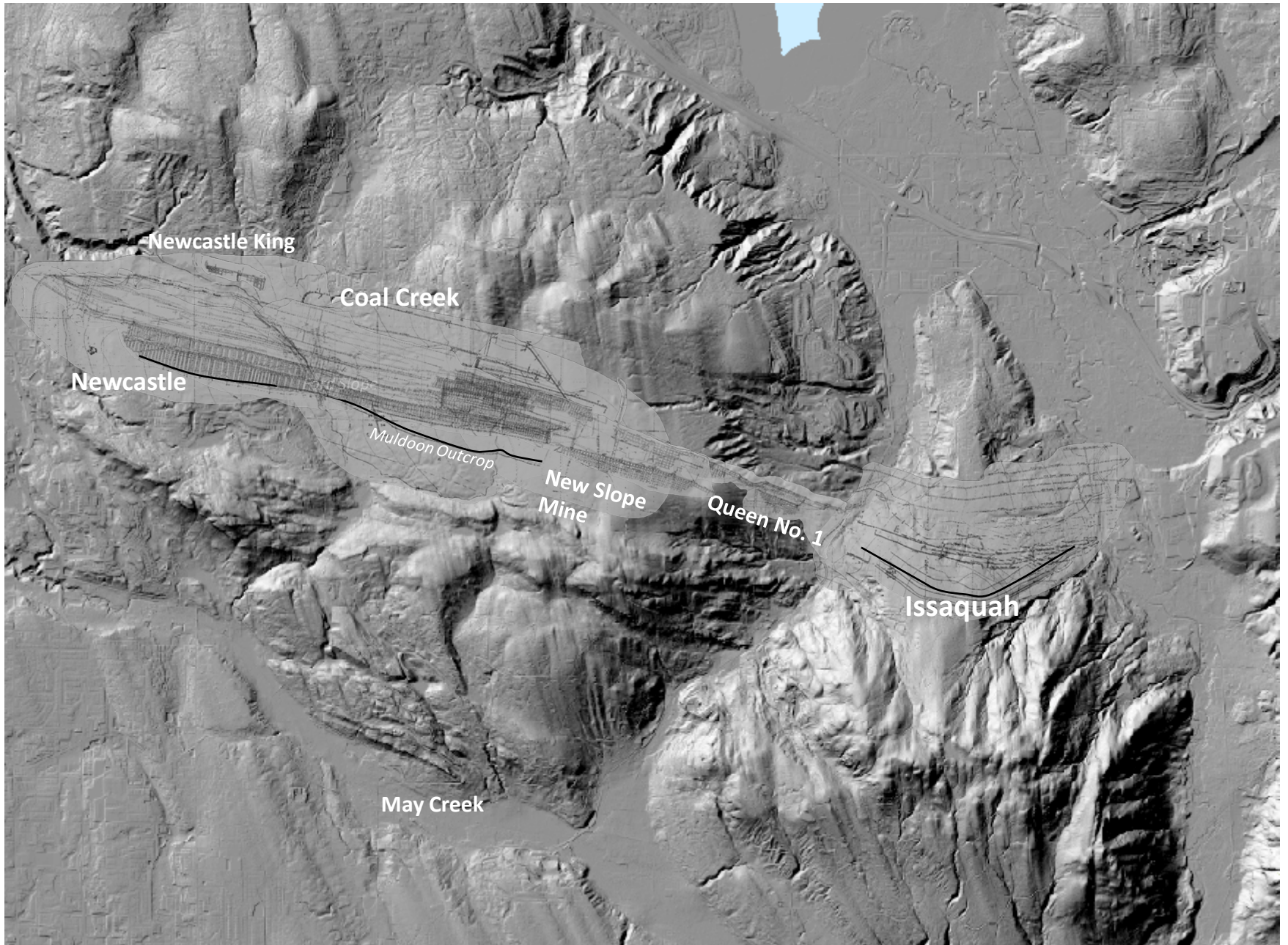
**Renton:** Late Eocene non-marine sandstone, siltstone, clay, and coal

**Tukwila:** Mid-Late Eocene volcanic conglomerate and other volcanic-derived sedimentary rocks.





# Areas underlain by coal mines







# Hike #1: Sky Country Trailhead

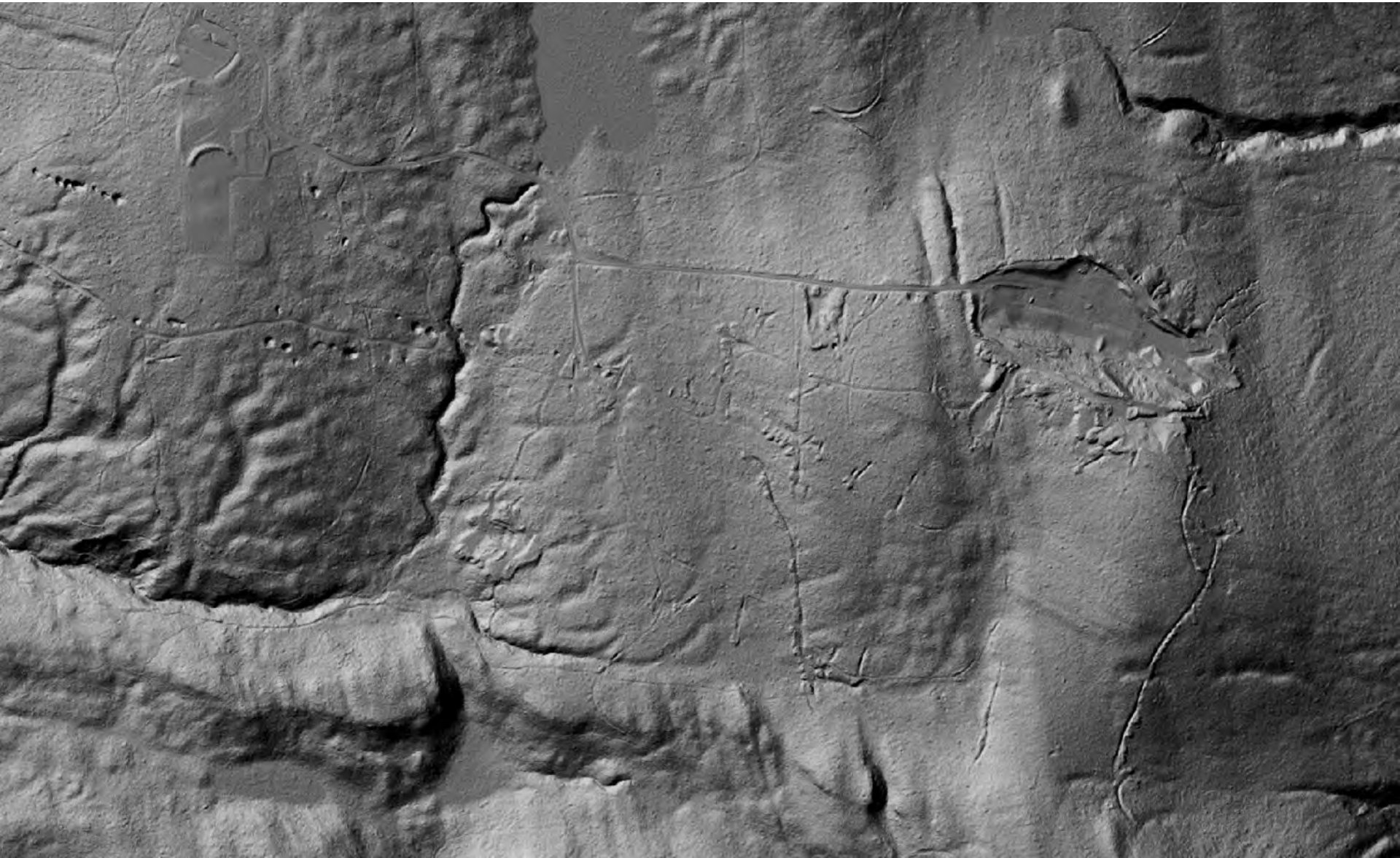
Clay Pit

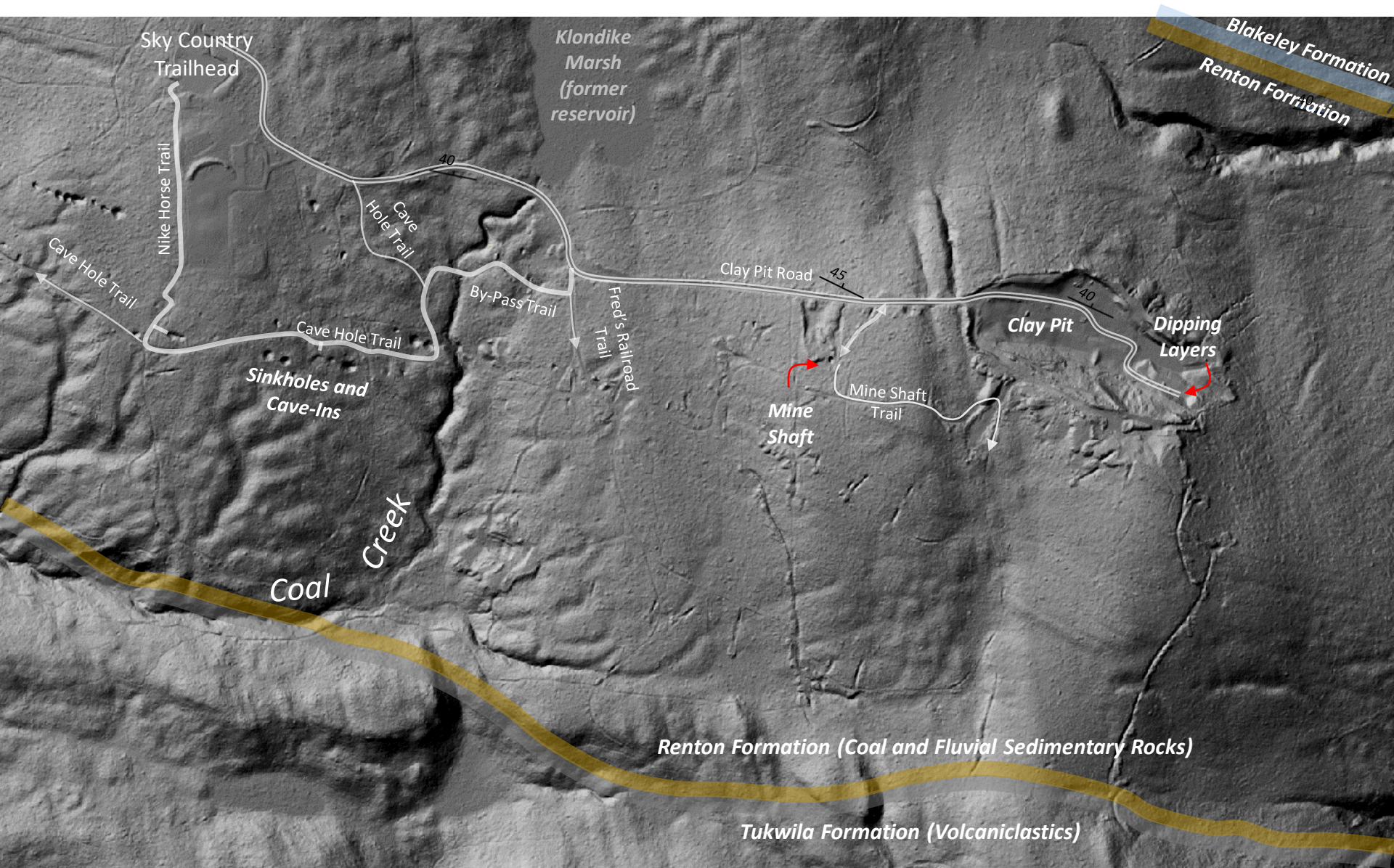
Mine Shafts

Sinkholes









Sky Country Trailhead

Klondike Marsh (former reservoir)

Blakeley Formation  
Renton Formation

Nike Horse Trail

Cave Hole Trail

40

By-Pass Trail

Fred's Railroad

Clay Pit Road

45

Clay Pit

Dipping Layers

40

Sinkholes and Cave-Ins

Mine Shaft

Mine Shaft Trail

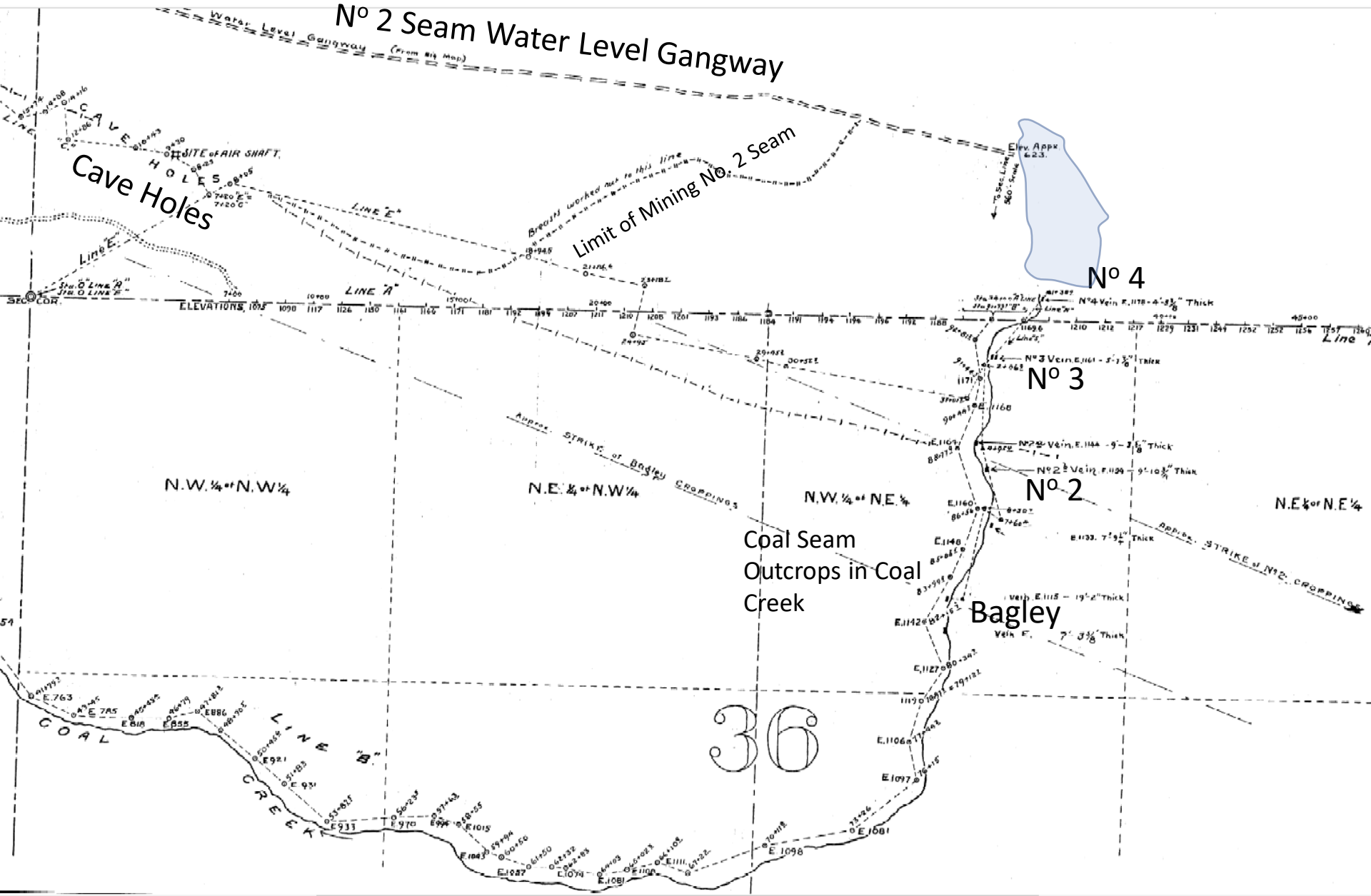
Coal Creek

Renton Formation (Coal and Fluvial Sedimentary Rocks)

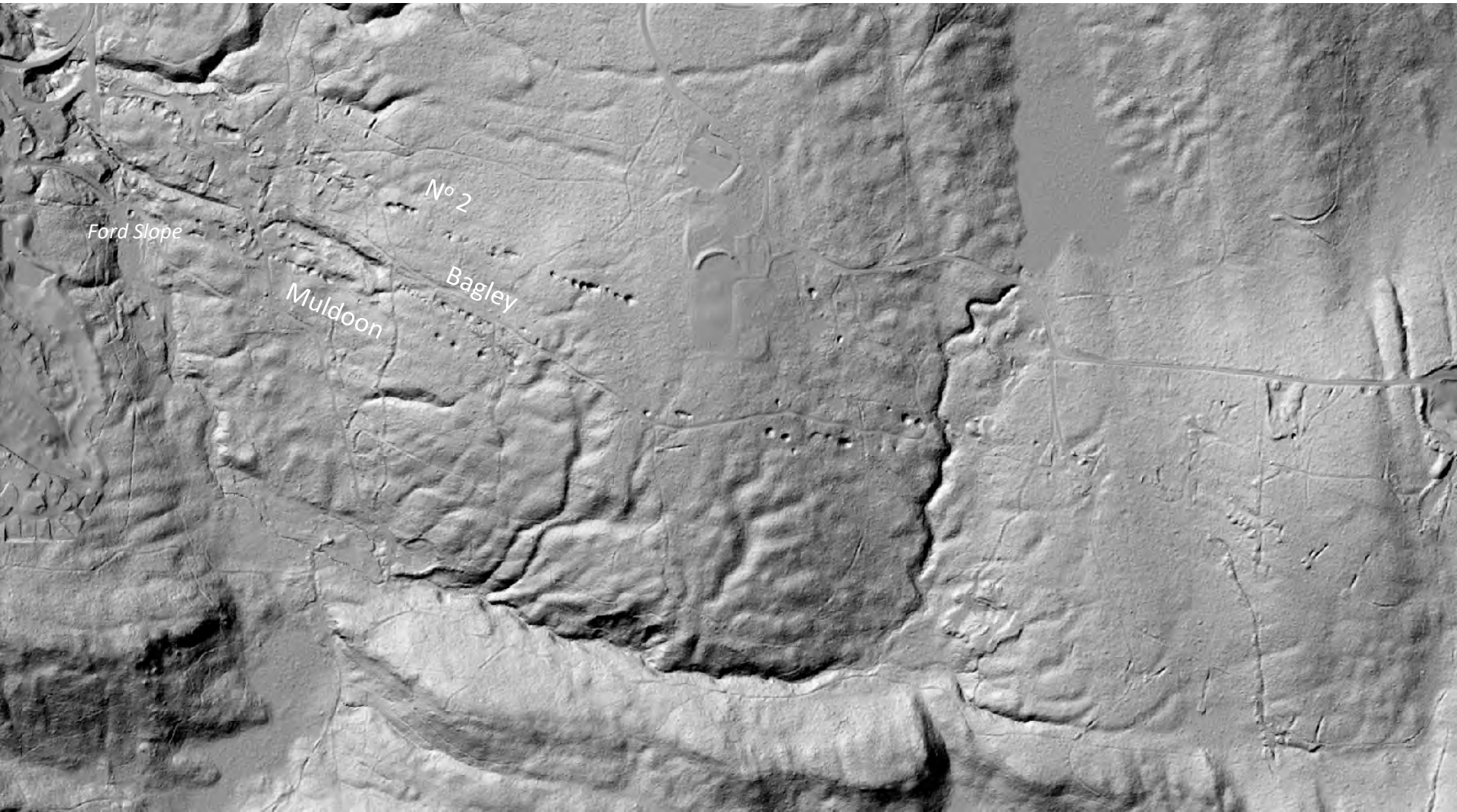
Tukwila Formation (Volcaniclastics)



# N° 2 Seam Water Level Gangway



Seams associated with cave holes (mine subsidence)







Klondike Swamp/Reservoir and Source  
of Coal Creek





**Air Shaft to No 4 Seam and  
Primrose Tunnel**





Dip Face in Renton, Clay Pit



Cave Hole (mine sinkhole)



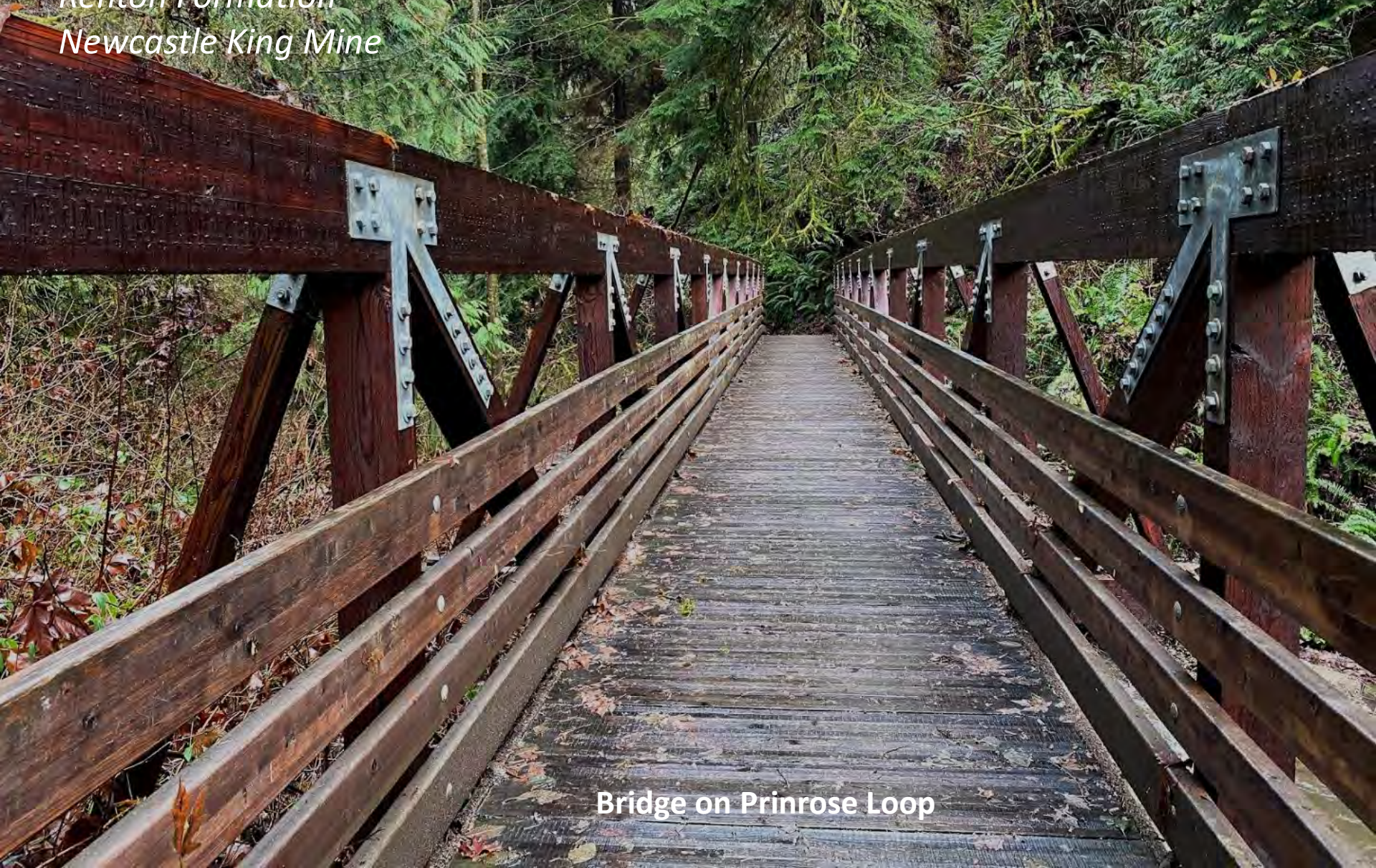


# Hike #2: Washout Way and Primrose Loop

*Slope Failures in Glacial Material.*

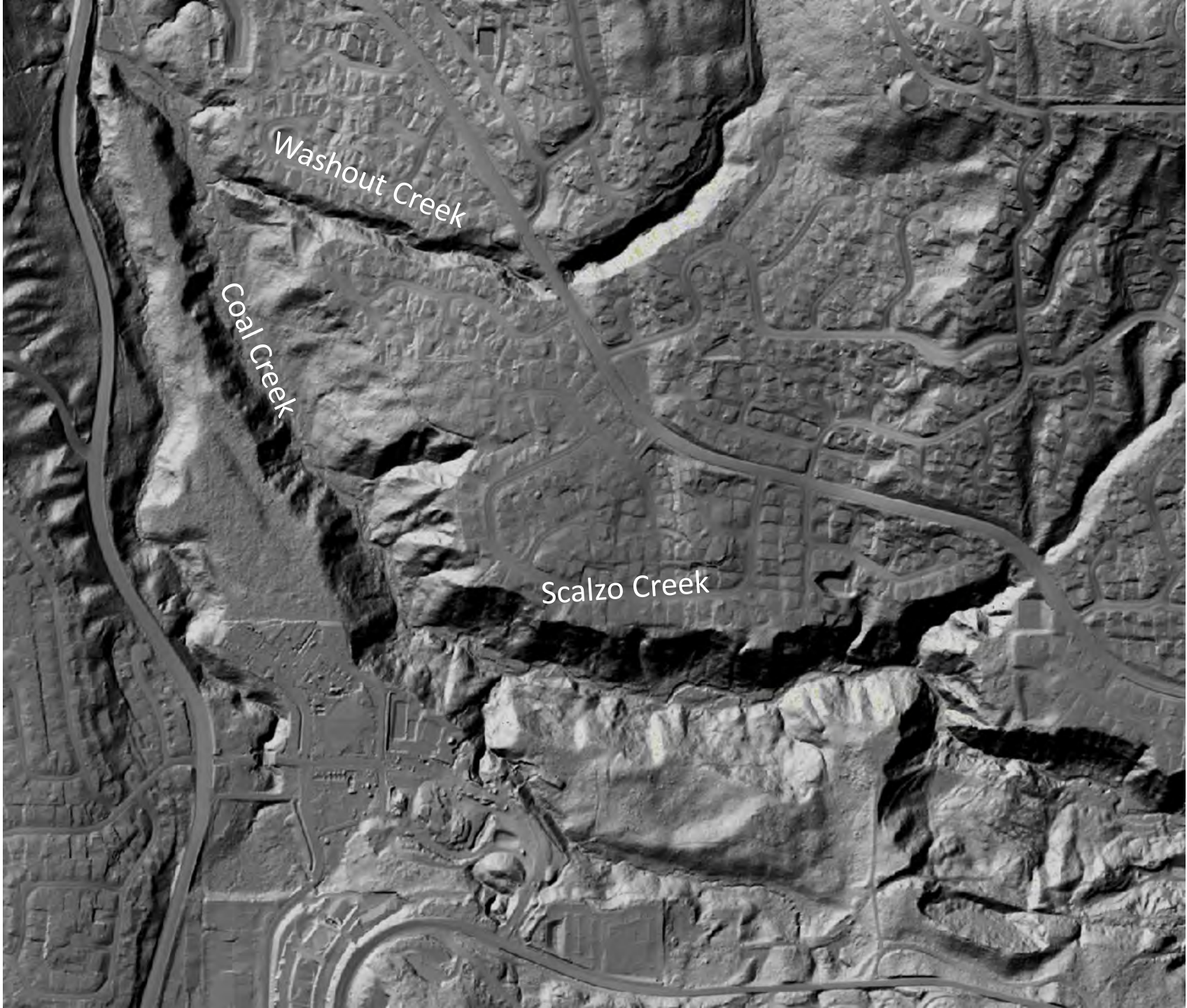
*Renton Formation*

*Newcastle King Mine*



**Bridge on Prinrose Loop**



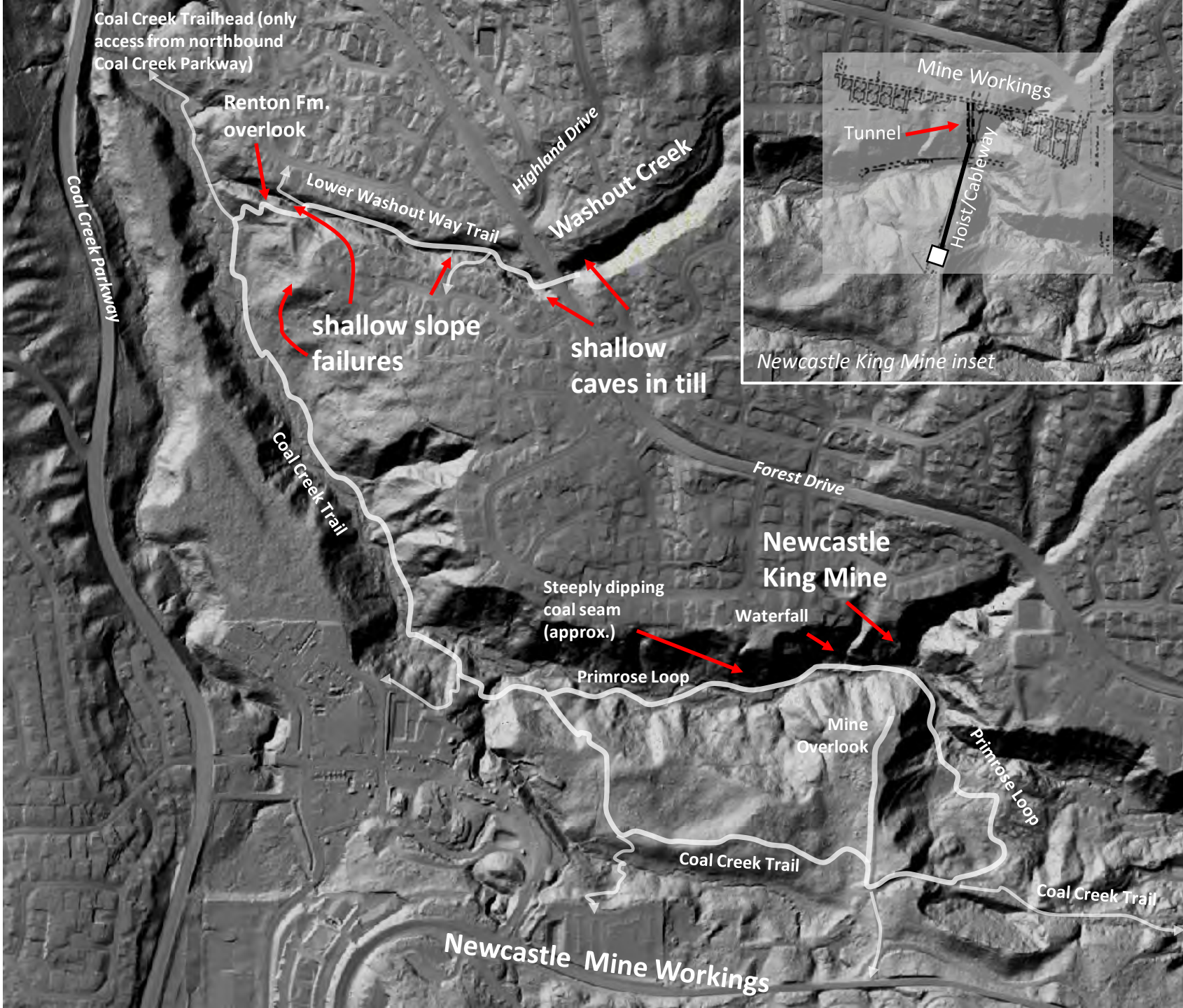


Washout Creek

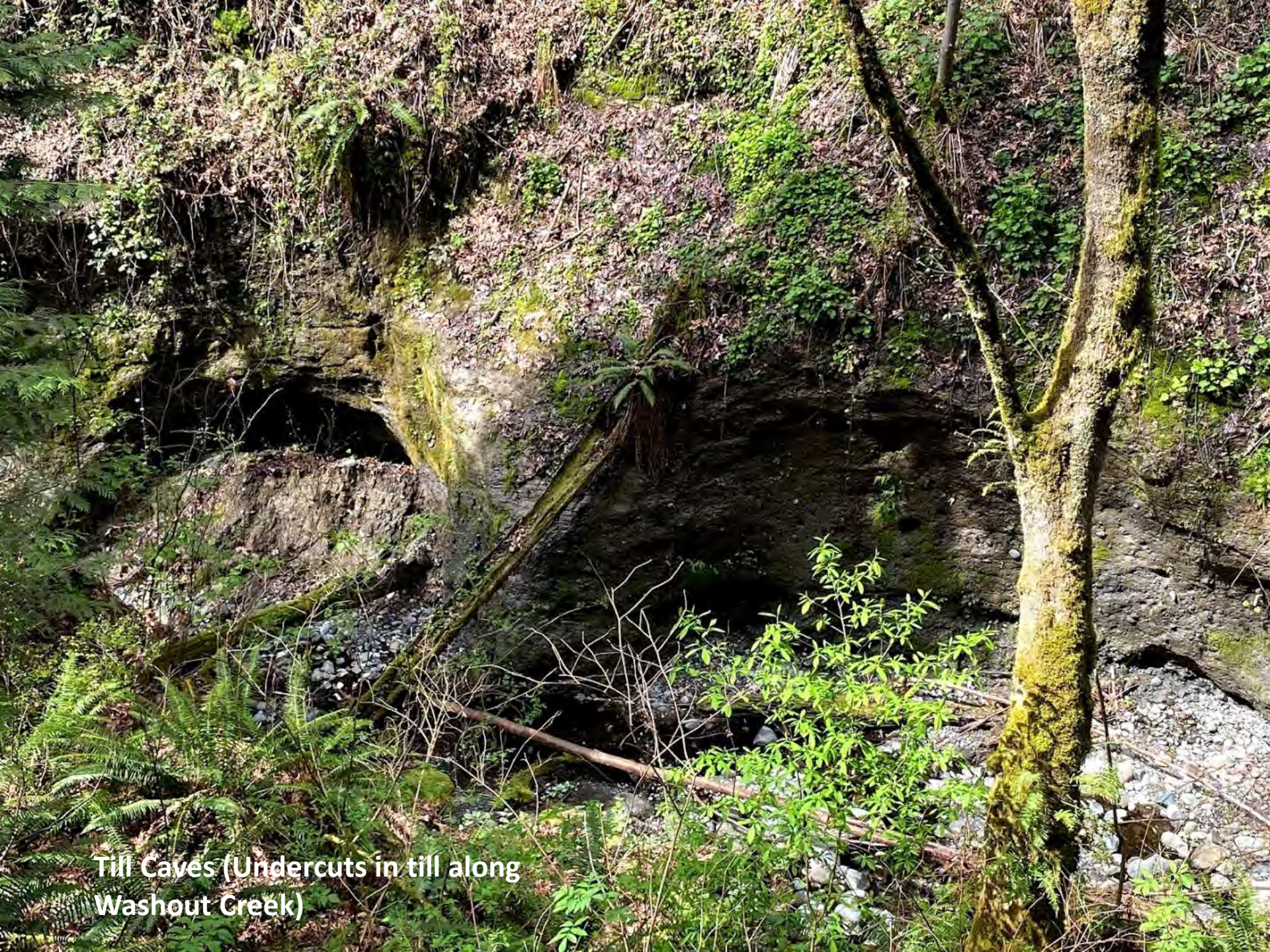
Coal Creek

Scalzo Creek









**Till Caves (Undercuts in till along Washout Creek)**





**Landslide Along Washout Creek**





**Overlook into  
Washout Creek, Creek  
bed on Renton  
Bedrock**



**Sand flows from slope failure  
above Coal Creek Trail near  
intersection of Lower Washout  
Way and Coal Creek Trails**





**Steeply dipping carbonaceous  
layer in Coal Creek**





**Sandstone Falls**



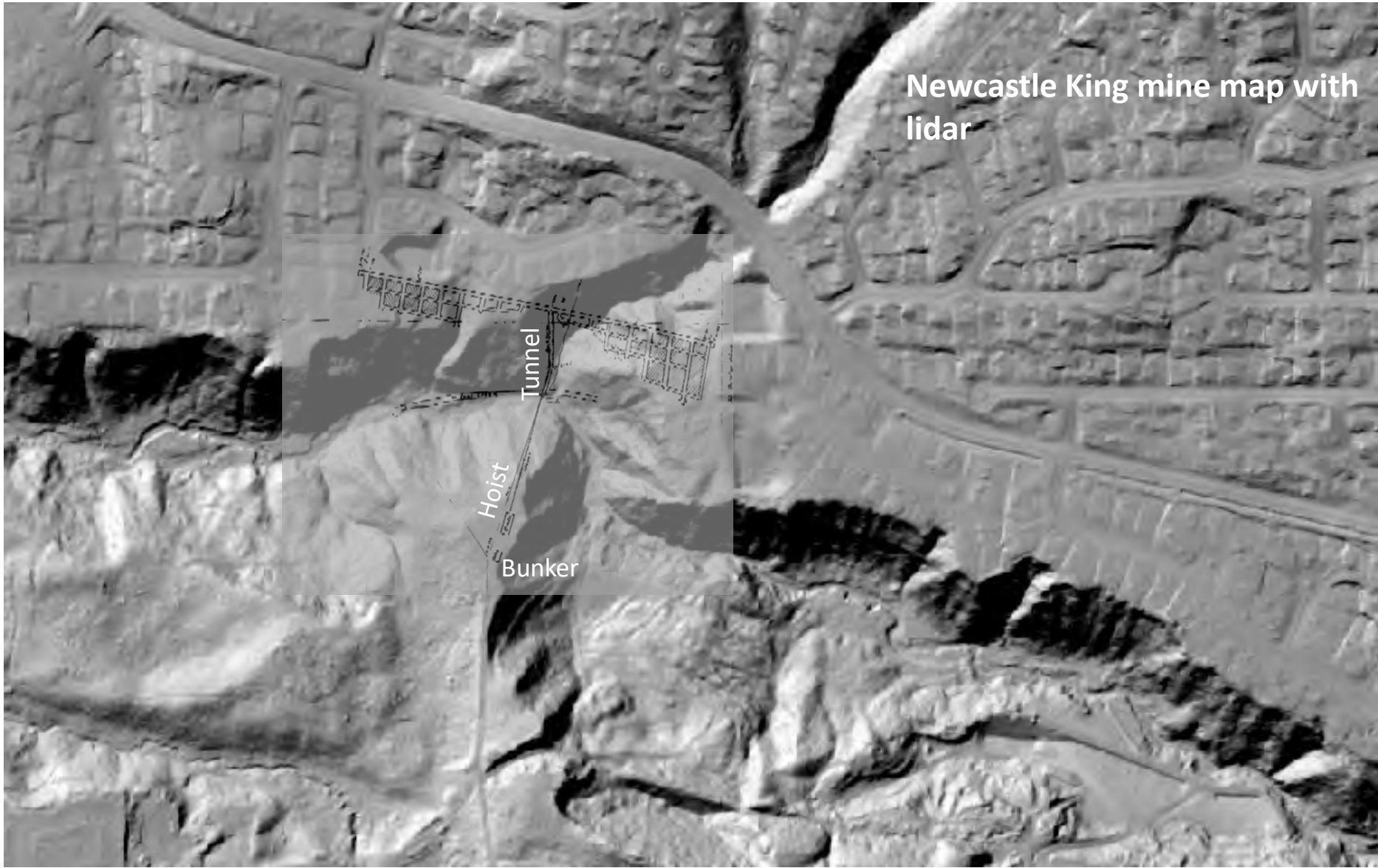




Along Primrose Loop



Newcastle King mine map with  
lidar





A photograph of a lush forest. On the left, a large tree trunk is covered in thick green moss and ferns. A path leads from the foreground into the distance, flanked by various trees and dense ferns. The scene is vibrant with green and brown tones.

**View from  
Primrose Loop  
across Coal Creek  
to vicinity of  
Newcastle Mine  
tunnel portal**



# Hike #3: Red Town Area

*Center of Mining Operations*

*Coal Seam*

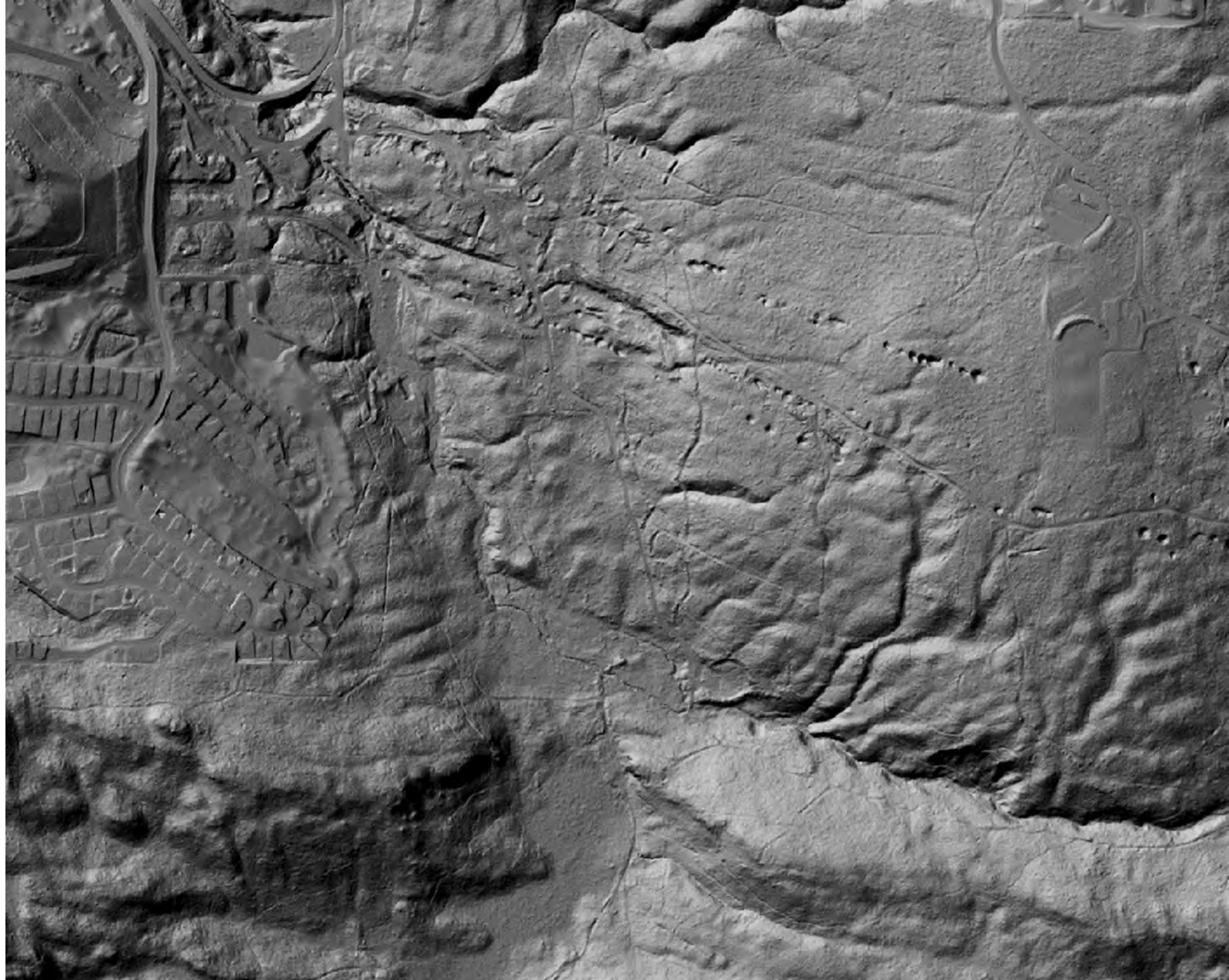
*Tukwila Rock Jumble: Quarry, Rockfall, or ?*

*Coal Creek Falls*



**Coal Creek Fall  
(photo Manique  
Talaia-Murray)**









Golf Course/  
Landfill/  
Strip Mine

Red Town  
Trailhead

Military Road  
Trail

Coal Seam in  
Sandstone

Wildside

Bagley Seam

Ford Slope

Rainbow Town

Cave Hole Trail

Mine Sinkholes

Cave Hole Trail

Sky  
Country  
Trailhead  
Former  
Surface-  
Air Missile  
Base

Nike Horse Trail

Coal Creek

Red Town Trail

Coal Creek Falls Trail

Redton Formation  
Tukwila Formation

Marshall's  
Hill Trail

Indian Trail

"Quarry"

Indian Trail

Coal Creek Falls

Coal Creek  
Falls Trail

Quarry Trail

Quarry Trail





**Sandstone and  
coal seam in  
creekbed off  
Military Road  
Trail near Red  
Town trailhead  
(photo: Manique  
Talaia-Murray)**





WARNING  
NO SWIMMING  
NO BOATING

Ford Slope Portal









“Quarry”





Wedge Fracture

Bedding Fracture

Backwall Fracture



# Hypotheses

- Quarry?
  - Stated in trail guides and trail named for quarry
  - No evidence of blasting or rock removal
  - Not appropriate sized blocks for useful purposes
- Natural Rockfall
  - One of several rock falls on Cougar, Squak and Tiger Mountains
  - Only one on a gentle slope
  - Gravity only or Seismic Accelerations?
- Glacial Plucking













249,29

Curved Fracture  
in Backwall



# Hike #4: Lewis Creek Trail, Lakemont Gorge

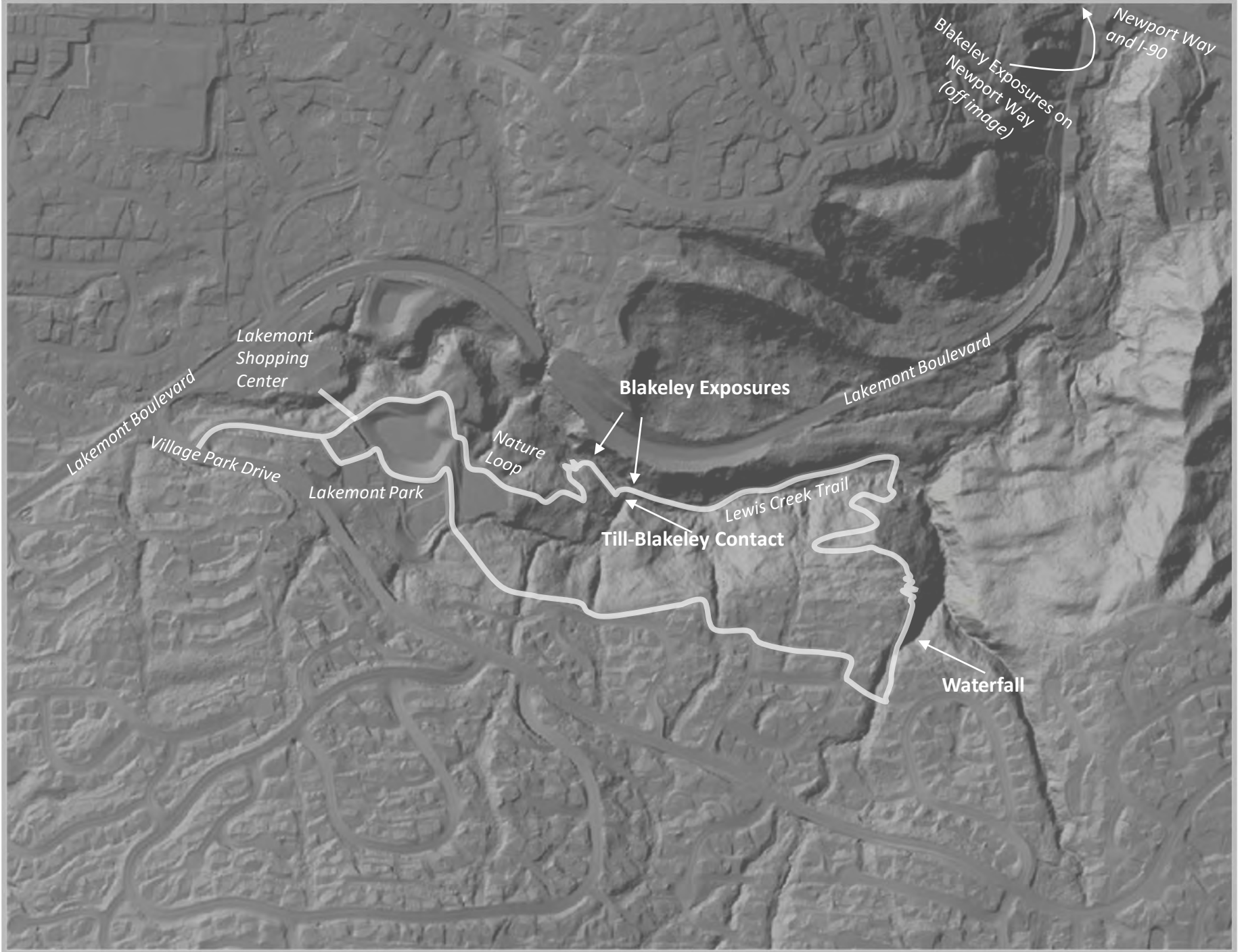
*Till-bedrock contact*

*Blakely Exposures*

*Waterfalls*







Newport Way  
and I-90

Blakeley Exposures on  
Newport Way  
(off image)

Lakemont Boulevard  
Lakemont Shopping  
Center  
Village Park Drive

Lakemont Park

Nature  
Loop

Blakeley Exposures

Lakemont Boulevard

Till-Blakeley Contact

Lewis Creek Trail

Waterfall



Till-Bedrock Contact in  
Lewis Creek





Waterfall on Blakeley Formation



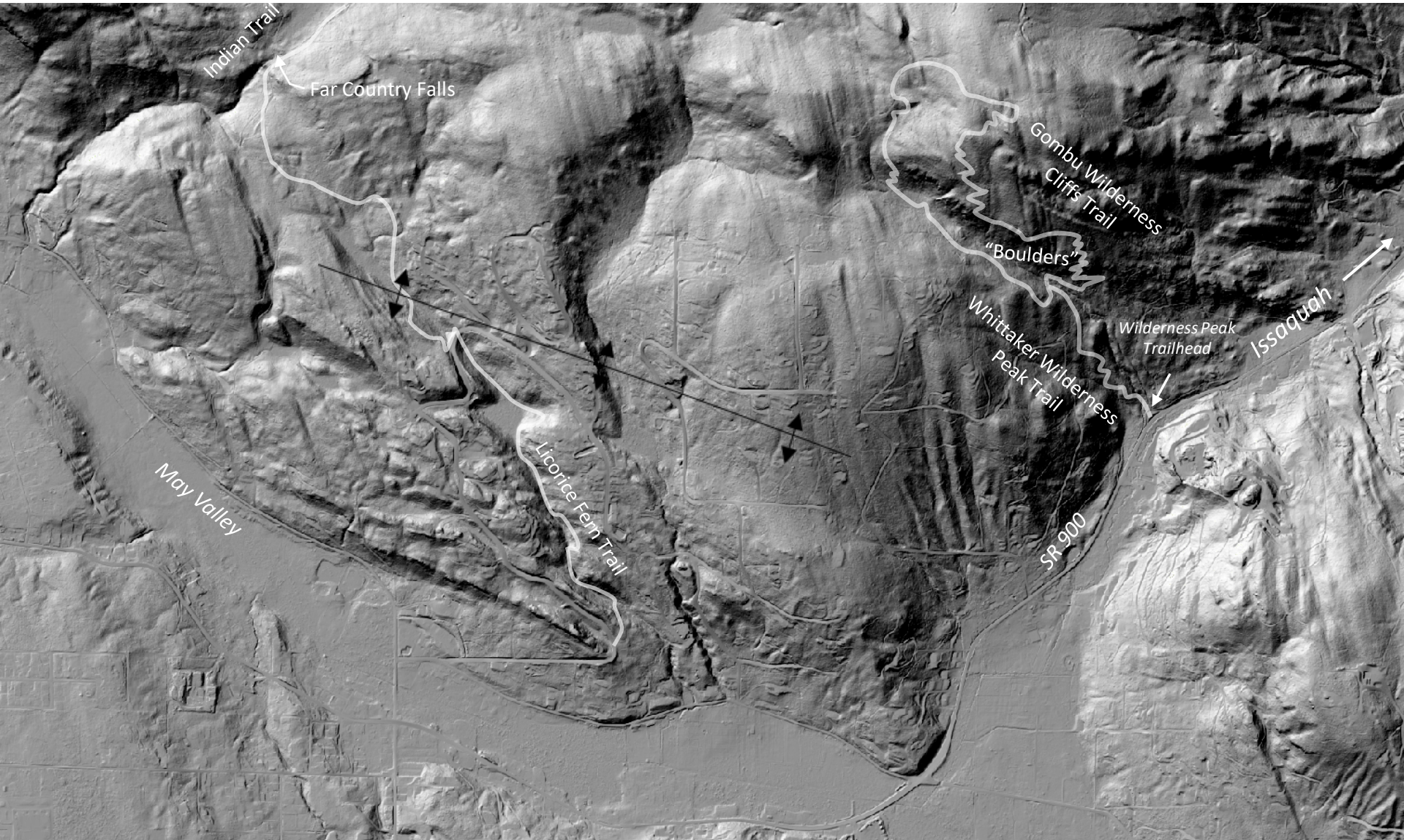


Additional Rockfall Walks  
Whittaker Wilderness Peak and  
Newcastle Crosstown/Terraces Trail Loop  
*Rockfalls from cliffs in Tukwila Formation*



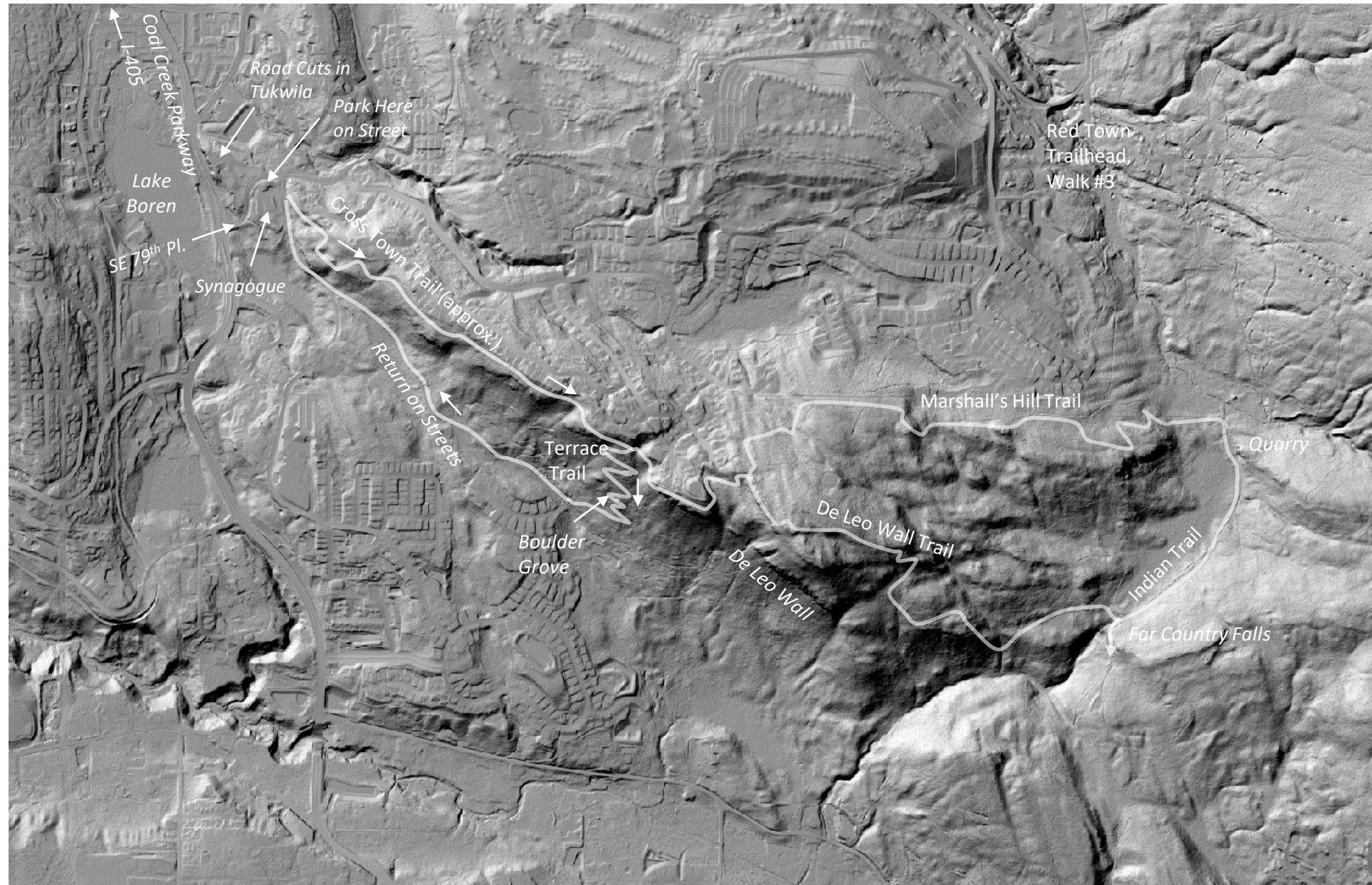


Wilderness peak loop is both a good workout and place to see rockfalls



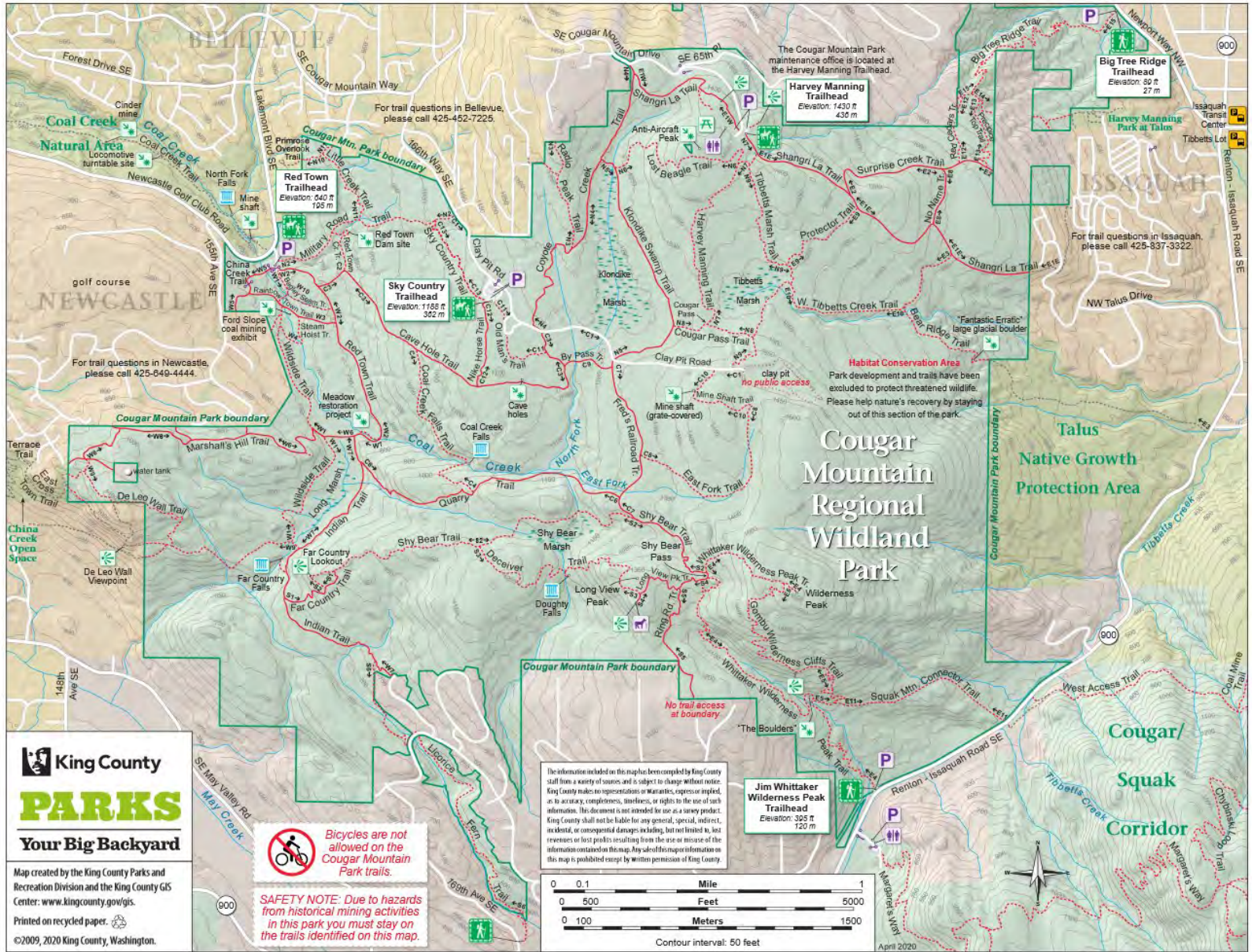


# Rockfall hike. Also some interesting highly weathered Tukwila on Cross Town trail.



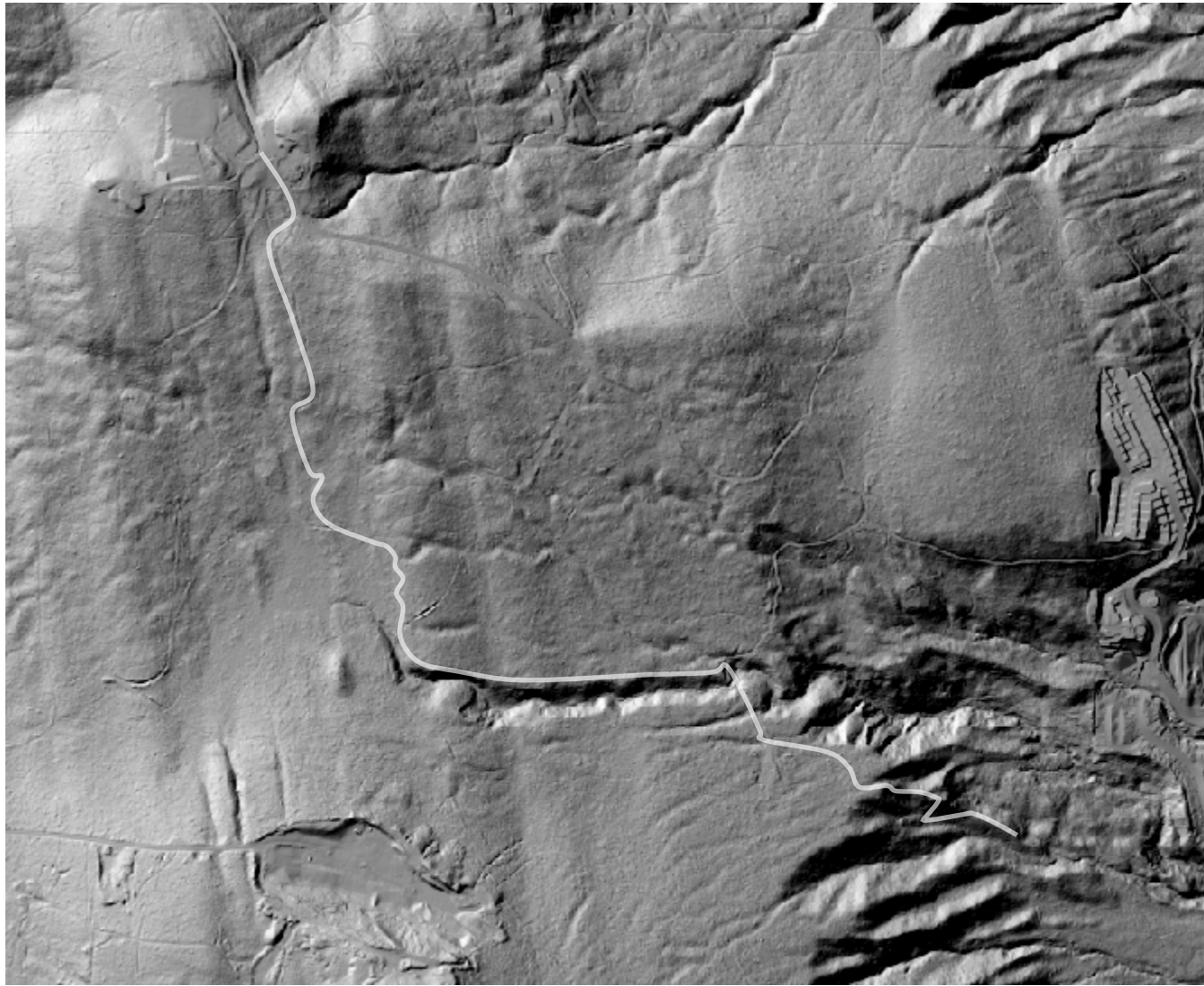


# Trail Maps and Links

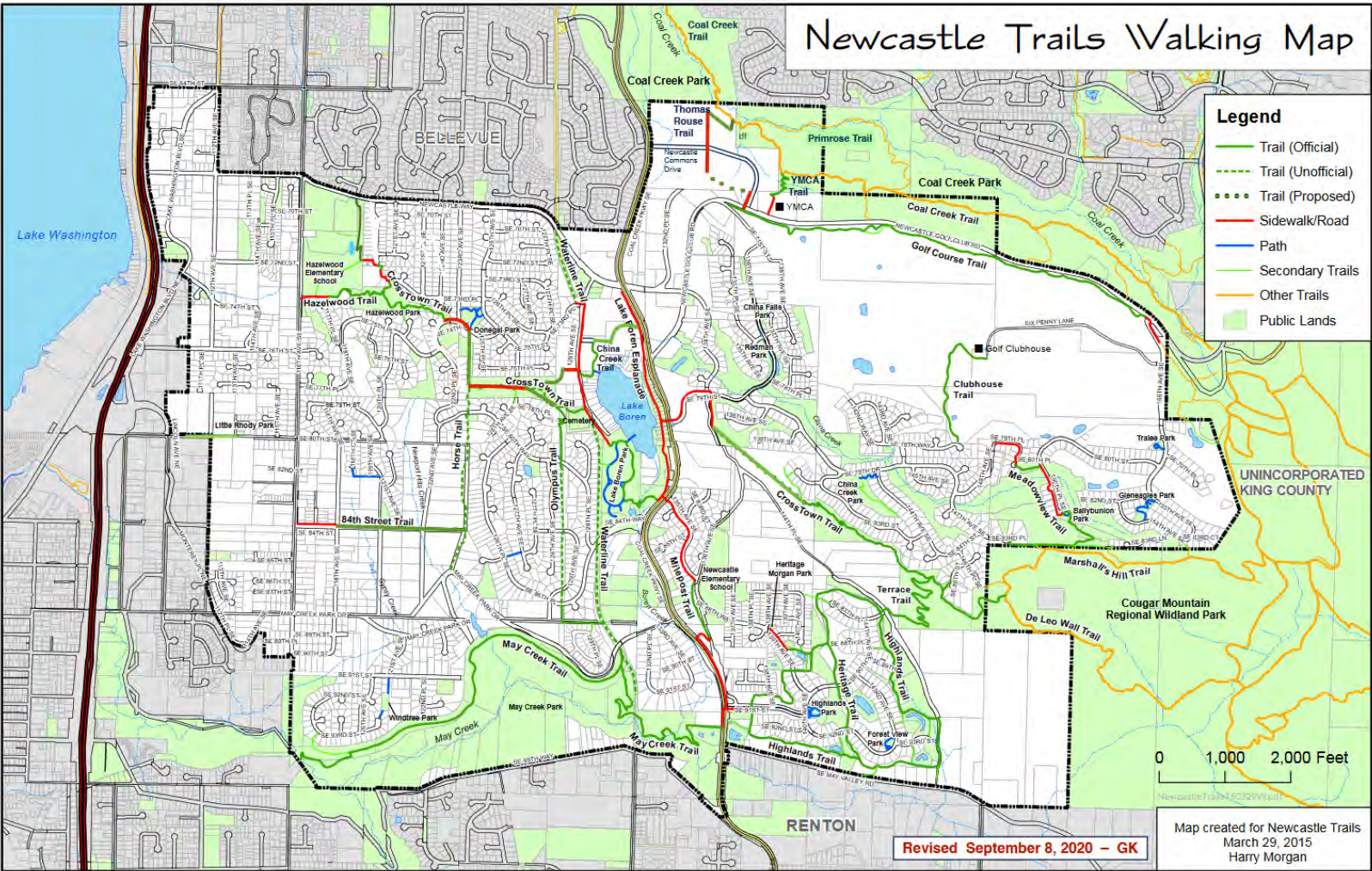


[https://aqua.kingcounty.gov/gis/web/VMC/recreation/BCT\\_CougarMtn\\_brochure.pdf](https://aqua.kingcounty.gov/gis/web/VMC/recreation/BCT_CougarMtn_brochure.pdf)





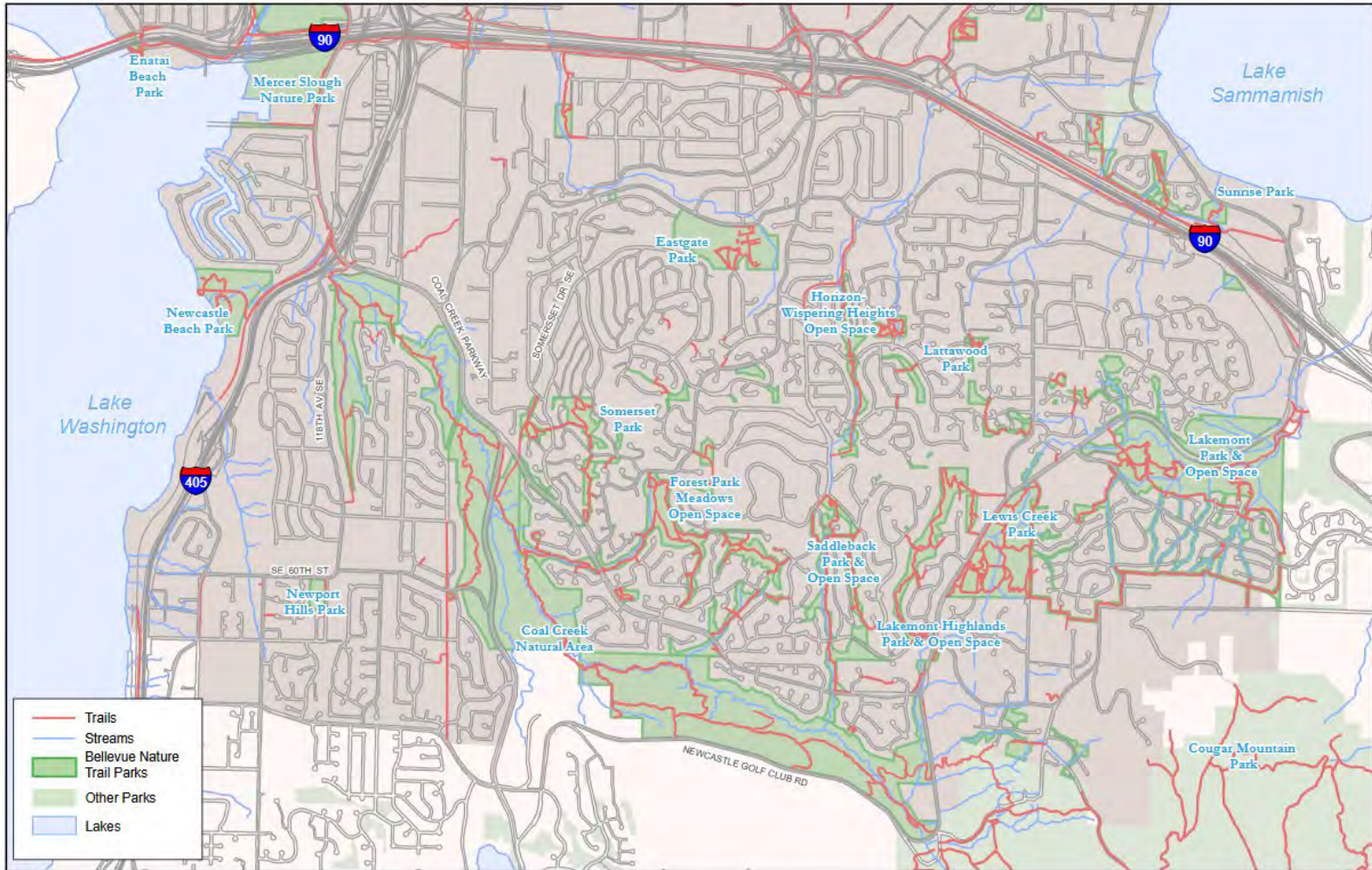




<http://newcastletrails.org/downloads/walkingmap2019.pdf>



# South Bellevue



[https://bellevuewa.gov/sites/default/files/media/pdf\\_document/trail\\_guide\\_map\\_south\\_bellevue\\_11-2013.pdf](https://bellevuewa.gov/sites/default/files/media/pdf_document/trail_guide_map_south_bellevue_11-2013.pdf)