Mapping Potential Habitat with Remote Sensing

Virtual Geomorphic Mapping of Off-channel Salmon Refugia

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LiDAR Learning Event, UW-DNR
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Dosewallips River

- In partnership with Port Gamble S’Klallam Tribe
- Relatively undisturbed watershed; 10 miles of habitable river miles
- Eastern Olympic Peninsula, western Hood Canal
- Lower 3-5 miles lightly to moderately developed
Current Conditions

- Dosewallips River historically clear cut
- Otherwise, near natural, recovering forest
- LWD is making it’s way to stream, sans anchor pieces
- LWD is currently not providing consistent refugia
Needs

• Identify potential near and off-channel habitat for endangered salmonids in a recovering stream
• Where are abandoned and overflow channels?
• What are their relative elevations to current stream elevations?
Method Development

- Use LIDAR elevation data to identify potential habitat (avulsed, migrated, and overflow channels)
  - Elevation maps
  - Slope derivatives
- Use color orthophotography to verify and augment
- Multiple lines of evidence; LIDAR, color orthophotos, field mapping
- Test methods on several unique reaches
LIDAR: lessons learned

• Low level flights
  – Resolution vs parallax; a tough choice

• Post-processing
  – Specifications; good contracts make good data
  – Reprocessing; the terrain under investigation may not justify it.....
Resolution vs Parallax

Unanchored LWD
RAW LIDAR
1.3 MILLION POINTS
FIRST PASS
502,000 POINTS
THIRD PASS
207,000 POINTS
SIXTH PASS
102,000 POINTS
NINTH PASS
77,600 POINTS
12th PASS
66,900 POINTS
2.9% removed
15th PASS
61,500 POINTS
2.7% removed
Benches identified better.....no habitat

18th PASS
57,400 POINTS
1% removed
River Mile 5
(area under investigation)
ELEVATION ABOVE RIVER
ELEVATION
Legend

chan_elabv arc

<all other values>

GRIDCODE

0
1
2
3
4
5
6
• MidColumbia LiDAR

Nason Cr