Post-Mortem

An UPSAG landslide prescription effectiveness study

Contributors: Julie Dieu, Abby Hook, Greg Stewart, Laura Vaugeois, Curt Veldhuisen, Jenelle Black, Lynne Rodgers Miller

Why study landslides?

- **WAC 222-10-030**
  - Specific mitigation measures or conditions must be designed to avoid accelerating rates and magnitudes of mass wasting that could deliver sediment or debris to a public resource or […] threaten public safety

The rules say we should limit management-induced landslides

Post-Mortem Purpose

- Determine whether FFR mass wasting prescriptions are effective at reducing landslides from forest practices.
- From Schedule L-2: S8. Test the effectiveness of mass wasting prescriptions in meeting mass wasting targets.

Hypotheses

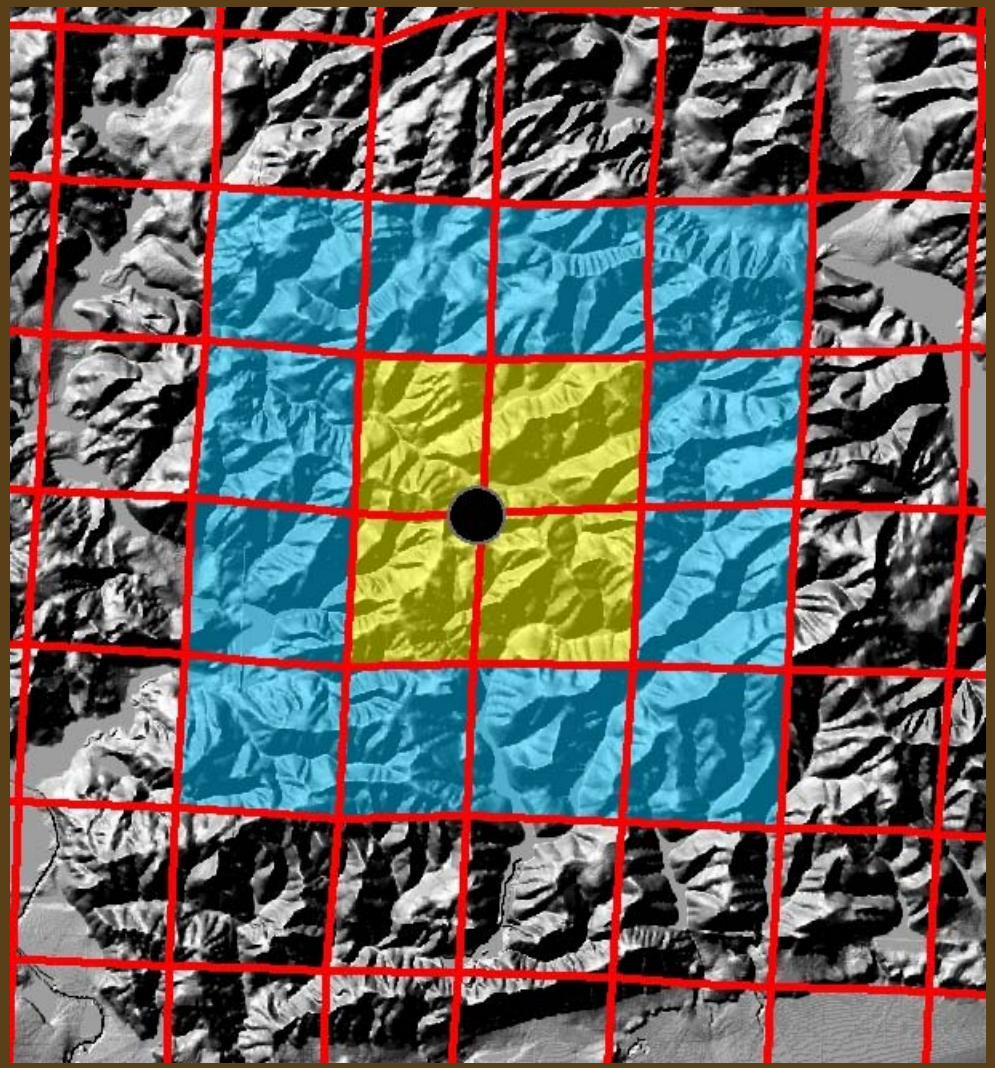
- Macro Hypotheses
  - Compare statistically the forest practices effectiveness for 5 harvest treatments and 5 road treatments
- Micro Hypotheses
  - Suggest possible outcomes of trigger data analyses
  - May not be statistically significant given small sample size for any given BMP or landslide trigger

Proposed Study Design

- Statistically sample landslides
  - Randomly select 21-28 4-square-mile blocks
  - Stratify harvest and road types
  - Count landslides/Estimate volumes
- Identify individual triggering mechanisms at each landslide

Sampling Plan – Cluster Design

- Each cluster becomes a sample unit.



Harvest Strata

- Clearcut, 0-20 years
- Partial Harvest, 0-20 years
- Buffered, 0-20 years
- Sub-mature, 21-40 years
- Mature, 41+ Years

Sampling plan – cluster design

- Map cluster with polygons representing harvest and road strata.
- Slide data is normalized by area or road length (e.g., density).

Road Strata

- Substandard
- Orphaned
- Standard
- Mitigated
- Abandoned

Statistical Design – Cost

- We need a storm to produce >= 1 slide per mi^2 over 600 sq. miles of land subject to forest practice rules.
- Air photos - $80,000-200,000
- Photo interp - $84,000-95,000
- Field crews - $255,000-415,000
- Access/Analysis - $140,000

Mass Wasting Landscape-Scale Effectiveness Monitoring

- UPSAG will initiate the development of this study design as we have time around the implementation of Accuracy & Bias and Post-Mortem.
- It will concentrate on the determination of natural background and on the long-term trends in rates of landslides from forest practices.
- As the Post-Mortem made so much progress towards full landscape-scale, we believe that this study may be 1 or more add-ons to Post-Mortem (that will require additional peer-review).