

**Draft Plan and Initial Responses for TFW Policy Input and Discussion  
Regarding the Forest Practice Board's Direction to TFW Policy from May 13, 2014 Meeting**

TFW Policy Co-Chair Draft  
9-18-14

NOTE: The FPB Motion language is indicated in *italicized font*. Draft example language for consideration in response to the FPB is in normal font.

*Dave Somers moved the Forest Practices Board direct the Adaptive Management Program to prioritize the mass wasting work as follows:*

*1. Complete the process review related recommendations resulting from the Mass Wasting Effectiveness study, including potential threats to public safety, and report to the Board at the August meeting.*

**Findings**

- TFW Policy agreed that the level of documentation and transparency in the process used to avoid harvest on unstable slopes could be improved by changes to the Forest Practice Application Form. These changes have been completed and the form has been implemented.
- The Department of Natural Resources has documented the Forest Practice Application review process for unstable slopes. At this point in time, TFW Policy has no additional comments on the review process for the Department of Natural Resources' consideration with the exception of the ongoing board manual review.
- The department of Natural Resources has issued guidance related to their review of Forest Practice Applications by two memos, the first issued on May 9, 2014 and subsequently updated on June 13, 2014. TFW Policy agrees that the memos provide appropriate direction to Department staff regarding; use of the new form, additional information requests, and how to identify public safety risks.
- DNR Board Manual revision related to ground water recharge area delineation
- DNR Rule

**Outstanding Questions**

- There are remaining process concerns expressed by some caucuses that relate to both public safety and public resources. These include the evaluation of delivery potential associated with all landslide types. TFW Policy Recognizes that the Department of Natural Resources is making changes to the Board Manual related to delivery potential. Until that work is completed, TFW Policy cannot agree that these changes will address all caucuses concerns.
- AND?? Any outstanding questions related to the BM revision and rule

**Recommendations**

- At this point in time, TFW Policy does not have any additional recommendations related to the Forest Practice Application Review Process, beyond those already made and responded to, resulting from the Mass Wasting Effectiveness study, including potential threats to public safety specific to the Forest Practice Program.
- OR – additional recommendations related to the review process after review of GDSL Board Manual and rule change.

*In addition, make recommendations related to:*

- *Identification of potential gaps in information about location of glacial deep seated landslides and recommend measures to close gaps.*

### **Findings**

- There is a wide range of information sources used to identify glacial deep seated landslides (Appendix A).
  - XX% of the areas subject to GDSLs have adequate LiDAR coverage to help identify the location of GDSL.
- The use of these information sources varies widely based on the skill set of the landowner.
- The Department of Natural Resources also utilizes these information sources to ensure that landowners are identifying Glacial Deep Seated Landslides.
- Access to these information sources may be challenging for some landowners and external reviewers.
- Regional and project specific mapping of glacial deep seated landslides is highly variable in terms of scope, accuracy, and precision and varies widely in its accessibility.

### **Outstanding Questions**

- What are the processes and responsibility for updating information sources?
- With the new forms, how will DNR be collecting and tracking that data to improve the dataset and information on where GDSLs/GWRAs are and what techniques are used to identify the features?

### **Recommendations**

- TFW Policy recommends that the following be included in the Board Manual revision:
  - listing existing information sources that can be helpful in identifying Glacial Deep Seated Landslides,
  - guidance to landowners on the appropriate use of these information sources and the need for soliciting advice from qualified experts, and
  - outlining the DNR review process for ensuring that Glacial Deep Seated Landslides are identified so that landowners and external reviewers clearly understand the process and the expectations for exchange of information.
- TFW Policy recommends that the quantity and quality of LiDAR coverage in areas that have potential glacial deep seated landslides be considered in the prioritization process for acquisition of LiDAR coverage.
- TFW Policy recommends that the Department of Natural Resources track data from new forms for how features are being identified and report back to TFW Policy and the Forest Practice Board.
- TFW Policy recommends that policies regarding access of stereo air photos be reviewed to attempt to accommodate agency, landowner, and public needs to access these resources to assist in identifying glacial deep seated landslides.
- TFW Policy recommends the following related to mapping of glacial deep seated landslides:
  - ENTITY identify the existing sources of mapping of glacial deep seated landslides and also identify how they can be accessed and provide a concise summary of how they were identified and their relative precision and accuracy.

Commented [AM1]: UPSAG?

- Following this first step, [ENTITY] should aggregate (electronically?) this information into a centralized location.
- After these have been completed [ENTITY] should use this information to prioritize any additional mapping needs and make recommendations as to the process for completing that mapping.

Commented [AM2]: DNR?

Commented [AM3]: UPSAG/Policy?

*• Evaluation of existing mitigation measures under current rule pertaining to groundwater recharge areas associated with glacial deep seated landslides.*

### **Findings**

- Under current rule, landowners must either avoid operations on ground water recharge areas and the associated glacial deep seated landslide or require and environmental checklist in compliance with State Environmental Policy Act (SEPA) and SEPA guidelines (WAC 222-16-050(1)).
- If the operations do not avoid ground water recharge areas and/or the associated glacial deep seated landslide, 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 could deliver sediment or debris in a manner that would threaten public safety (WAC 222-10-030(4)).
- Currently, there is not a systematic way to identify the precise number of Forest Practice Applications that avoid Glacial Deep Seated Landslides or that had operations associated with Glacial Deep Seated Landslides. The Department of Natural Resources has maintained a list since January 2011 of FPA's that have been reviewed for geologic issues. That list was queried for any FPA's that highlighted Glacial Deep Seated Landslides<sup>1</sup>.
  - Since 2011, at least 64 FPA's were evaluated for potential Glacial Deep Seated Landslides.
  - Of those, 46 actually had a Glacial Deep Seated Landslide.
  - Of the 46, 18 were withdrawn by the landowner or disapproved by DNR.
  - The remaining 28 were approved by either avoiding the features or meeting the requirements of WAC 222-10-030(4).
  - Of the 64 evaluated, 13 were classified as a Class IV special
- **Need to decide how to describe the range of mitigation measures identified in the 13 + FPAs**
- None of the existing approved watershed analyses have specific prescriptions associated with operations Glacial Deep Seated Landslides or associate Groundwater Recharge Areas.

### **Outstanding Questions**

### **Recommendations**

*2. Begin the review of the existing mass wasting research strategy, including potential threats to public safety and the glacial deep seated landslide program, with an initial report back at the Board's August meeting.*

<sup>1</sup> The query did not identify all FPA's that were reviewed during this time period for Glacial Deep Seated Landslides.

## Findings

TFW Policy recognizes that the existing CMER Workplan for ground water recharge areas associated with glacial deep seated landslides needs to be revisited.

The existing studies in the workplan were not pursued by UPSAG for several reasons, however, it was recognized that pursuing this line of research would not add additional certainty to the regulatory process and would be quite expensive.

## Recommendations

TFW Policy Recommends that UPSAG begin exploring the options outlined in the Technical Subgroup of TFW Policy proposal dated September 2, 2014.

TFW Policy also recommends that UPSAG develop and execute a scope of work for a literature review including, but not limited to, the studies identified by the DNR Board Manual Qualified Expert group. Funding will come from the \$50,000 approved in this fiscal year for glacial deep seated research.

*I further move that the Forest Practices Board direct TFW Policy Committee to complete the Type F assignments by the November meeting and report back to the Board at the August meeting on progress.*

Answer depends on TFW Policy's progress on existing Board direction on unstable slopes.

## Appendix 1

Tool	Description	Item format	Access	Extent of Spatial Coverage	Scale/Level of detail	Website Link
Digital Elevation Models						
Lidar Digital Elevation Model (DEM)	Digital elevation model derived from laser and analysis of reflected light. Often processed to remove vegetation (aka bare earth) to derive modelled formats of hillshades, slopes, contours and other applications	GIS based product	In the public domain and accessible through Puget Sound Lidar Consortium; processed through various GIS products	Roughly 6,400 sq. mi. of 1-meter lidar and 18,700 sq. mi. for 2-meter lidar.	Provides for a 1 to 2 meter Digital Elevation model that can help resource managers clearly identify GDSLs. Some parts of the lidar data contains poor data collection through vegetation and can lead to coarseness in data (aka pyrite forests or crystalline forests)	<a href="http://pugetsoundlidar.ess.washington.edu/">http://pugetsoundlidar.ess.washington.edu/</a>
10-meter Digital Elevation Model (DEM)	Digital elevation model produced by the US Geological Survey through various formats, in which coarseness averages or estimates value of elevation over a 10 meter grid	GIS based product	In the public domain and accessible through various sources	Statewide	Moderate resolution, difficult to determine small features	<a href="http://gis.ess.washington.edu/data/raster/index.html">http://gis.ess.washington.edu/data/raster/index.html</a>
DNR Map Layer (GIS data, landslide hazard zonation, landslide inventory, mass wasting prescriptions...						
Landslide Hazard Zonation	The Landslide Hazard Zonation (LHZ) Project is to create a vastly improved screening tool by better describing and mapping all potentially unstable slope areas in priority watersheds. The purpose is to eliminate any errors of omission in the identification of unstable landforms during both harvest layout and permitting process. In addition to identifying areas of hazard for mass wasting, landforms and hazard classifications are linked to the degree of hazard and sensitivities to land management practices. The LHZ project also provides information useful for appropriate mitigation.	Reports, landslide and landform are in GIS format	Department of Natural Resources Website (Accessible by anyone)	Fifty-nine high priority watersheds	Contains mapped deep-seated landslide and can provide information on deep-seated landslide processes or potential sensitivities to landslide movement.	<a href="http://www.dnr.wa.gov/BusinessPermits/Topics/LandslideHazardZonation/Pages/fp_lhz_completed.aspx">http://www.dnr.wa.gov/BusinessPermits/Topics/LandslideHazardZonation/Pages/fp_lhz_completed.aspx</a>
Watershed Analysis; Mass Wasting Prescriptions	Watershed analysis is a biological and physical assessment of a watershed designed to address the cumulative effects of forest practices on specific public resources (fish, water, and capital improvements of the state) and on cultural resources. The Mass Wasting Prescriptions are specific to a landslide inventory and analysis of slope stability in relation to forest practices or general stability.	Reports, some landslides and landforms are in GIS format	Department of Natural Resources Website (Accessible by anyone)	Fifty-three watersheds	Contains mapped deep-seated landslide and can provide information on deep-seated landslide processes or potential sensitivities to landslide movement.	<a href="http://www.dnr.wa.gov/researchscience/topics/WatershedAnalysis/Pages/fp_watershed_analysis.aspx">http://www.dnr.wa.gov/researchscience/topics/WatershedAnalysis/Pages/fp_watershed_analysis.aspx</a>
Washington State Landslide Database	GIS polygon dataset with attributions (slope morphology, gradient, landslide type, land use association, and others) of a conglomeration of data from various sources (LHZ, Watershed Analysis, Geologic Maps, DNR Reconnaissance of landslides producing storm events, various other datasets)	Online interactive map and GIS	Washington State Geologic Information Portal (Accessible by anyone)	Generally statewide, data is limited by data input sources and does not capture all landslides in Washington State.	Contains mapped deep-seated landslide in spatial polygon format with attributed data attached that could provide additional information on deep-seated landslide mechanisms	<a href="http://www.dnr.wa.gov/researchscience/topics/geoscience/data/pages/geology_portal.aspx">http://www.dnr.wa.gov/researchscience/topics/geoscience/data/pages/geology_portal.aspx</a>
Geologic Maps	Geologic maps show the types and ages of rocks that occur at or near the Earth's surface. They show the locations of faults and folds, landslides, glacial deposits, and other regional or local features, depending on the scale of the map. Geologic maps are the most fundamental and important tool of earth scientists.	Online interactive map, pdf reports and GIS	Washington State Geologic Information Portal (Accessible by anyone); Department of Natural Resources Website (pdf reports)	At a scale of 1:100,000, the entire state; Partial coverage at scale of 1:24,000; various other scales throughout the state	Contains areas of mapped deep-seated landslides and can provide stratigraphic data to help determine potential deep-seated landslide mechanisms	<a href="http://www.dnr.wa.gov/researchscience/topics/geoscience/data/pages/geology_portal.aspx">http://www.dnr.wa.gov/researchscience/topics/geoscience/data/pages/geology_portal.aspx</a>
Forest Practices Application Geologic Reviews/Reports	Geologic reports completed by qualified experts that accompany FPA's (usually Class I or special or Class III) that analyze slope stability with accompanying forest management activities.	Online; pdf	In public domain through FPARS website.	Site specific for the area covered in the FPA	Analysis of deep-seated landslide (if existent) and will contain scientifically sourced information or professional opinion.	<a href="http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_fpars.aspx">http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_fpars.aspx</a>
Field Visit	Field visits are conducted by a qualified expert with accompany of a forester, forestry engineer or related occupation to determine potential slope stability issues and delineation of features.	Field review	Accessible through permission of the land owner	Statewide	Field review of area helps to determine indicators of slope stability, potential level of activity and delineation of features.	
Stereo Photos	Aerial photos that can be overlapped and viewed through a stereoscope to create a topographic view of the aerial photos	Paper/photo	Limited public access (often through Universities), usually must be purchased.	Statewide in various years	Allows remote review analysis of an area; smaller features are more easily discernable when vegetation has been removed from the site	
Orthophoto (NAIP)	Data collected by the USDA Farm Service Agency, National Agriculture Imagery Program, consisting of aerial imagery that has been converted to digital files and spatially rectified for access mostly in GIS programs	GIS based product	In public domain through various websites	Statewide in various years	Allows remote review analysis of an area; smaller features are more easily discernable when vegetation has been removed from the site	<a href="http://wagda.lib.washington.edu/data/type/photography/">http://wagda.lib.washington.edu/data/type/photography/</a>