M E M O R A N D U M

TO: Washington Forest Practices Board

FR: TFW Policy

RE: Report on Status of Policy's Response to Unstable Slopes Proposal Initiation dated February 10, 2016.

DT: April 28, 2017

Introduction: Procedural Summary of the Unstable Slopes PI

On February 10, 2016, the Forest Practices Board accepted a Proposal Initiation (PI) from the Department of Natural Resources to address issues raised by the Conservation Caucus (CC) in written material and testimony at the November 10, 2015 Board meeting. The specific components of the PI focused on concerns raised during the development of Board Manual Section 16, "Guidelines for Evaluating Potentially Unstable Slopes and Landforms."

In March 2016, the AMPA provided Policy with recommendations for how Policy could respond to the six elements of the PI, identifying both policy and science tracks under Board Manual M22-9 and 10.[1] After receiving feedback from UPSAG on the AMPA's recommendations in May, Policy convened an Unstable Slopes PI Subgroup composed of Scurlock (Conservation), Terwilleger (Industrial landowners) and Engel (State-DNR). In August 2017, Policy reported to the Board with specific recommendations for action on three topics, indicating that deliberations would continue in the subgroup on remaining issues. Since then, Scott Swanson, Policy Co-Chair and Counties' caucus representative has joined the subgroup. The subgroup has met three times since August.

Although Policy's response is ongoing, this memorandum describes Policy's actions to date in relation to each of the AMPA's recommendations on the PI.

Component 1: Non-glacial deep-seated landslides[2]

Task 1.1 – Science Track: Should all deep-seated landslides be added as rule-identified landforms found in WAC 222- 16-050(1)(d)(A) – (E), Class IV-special?

Policy Response Status: To begin to provide a scientific basis for answering this Policy

[1] "The **science track** evaluates currently available science, collects new information through research and monitoring, and synthesizes the best available information into a technical summary for Policy consideration." "Proposals seeking to change or clarify policies or change the way existing science is implemented in the rules are directed toward the **policy track**."

[2] See PI Attachment 4, memo authored by David Montgomery, dated November 9, 2015, to the Board outlining requested "Revisions to Guidelines for Evaluating Potentially Unstable Slopes"

question, the AMPA recommended asking UPSAG to recommend whether a study is warranted or if the work can be accomplished through a literature review in a proposal to Policy. UPSAG recommended a literature review to Policy, which Policy then recommended to the Board on August 4, 2016. A literature review is now underway by M2 Environmental Services and due for completion in June 2017 to address a series of questions related to the mechanics of non-glacial DSL failure and reactivation. This body of work will add to the literature review on glacial deep-seated landslides that Policy accepted as complete on March 2, 2017.[3]

Recommended Next Steps: It is anticipated that the literature review will inform the CMER Deep-Seated Research Landslide Strategy which is currently being developed by UPSAG. Policy will review the non-glacial DSL literature review as it did the glacial review, but will likely wait to make recommendations for next steps until it receives a presentation on the CMER Deep-Seated Research Landslide Strategy later this year.

Task 1.2 - Science Track. Reactivation and the impacts of forest practices.

1.2.A. Is further guidance needed for evaluating and assessing reactivation potential for all dormant or relict deep-seated landslides and any associated groundwater? If yes, should an assessment be required?

1.2.B. Do non-glacial deep-seated landslides have associated groundwater recharge areas? If yes, should an assessment for influence on the deep-seated landslide from the groundwater recharge area be required?

Policy Response Status: The AMPA recommended the Science Track for both parts of question 1.2, seeking an UPSAG recommendation to Policy. Policy agreed and UPSAG responded with a non-consensus report to Policy. Both parts will be further informed by the pending second literature review mentioned above.

Recommended Next Steps: When the non-glacial literature review comes to Policy, Policy will revisit the embedded policy questions and consult with UPSAG as they develop the DSL Research Strategy.

Component 2: Deep-seated Landslides, Public Safety Risk and Reactivation[4]

Task 2.1 Policy Track

2.1.1. Should a method to assess the degree of risk to public safety for glacial deep-seated landslides (low, moderate, high or uncertain) be developed? If yes, should

[3] Literature Synthesis of the Effects of Forest Practices on Glacial Deep-Seated Landslides and Groundwater Recharge (139 pp) and Findings Report (4 pp) (accepted by Policy March 2, 2017).

[4] See attachment 4 to the PI, Memo authored by David Montgomery, dated November 9, 2015 to the Board outlining requested "Revisions to Guidelines for Evaluating Potentially Unstable Slopes"

the assessment be required in rule? Or provided as guidance in the manual?

- *If a relative risk to public safety component is added to the Board Manual and/or rule a technical group (Science Track) should be convened to establish thresholds and methods used to conduct such an assessment.*

Policy Response Status: Progress in the subgroup was hampered by confusion over the specific public policy objectives being sought by this task, and no agreement has been reached to move forward with the tasks described by the AMPA.

Recommended Next Steps: The subgroup has asked the Conservation Caucus to clarify its public policy objectives around screening for public safety in order to sharpen the Policy discussion about the need to provide further assurance that risks to public safety and public resources are being avoided in the near term, i.e. prior to potential implementation of new screens as a possible result of the research recommended by the Unstable Slope Criteria TWIG. Conservation Caucus issues include the desire for greater transparency around classification of FPAs as Class III or IV, and assessments of "likelihood" required for Class IV-Special FPA under WAC sections 222-10-030 (1)(a)-(c).

Tasks 2.2 and 2.3: Science track

2.2 Is there existing science available to assess the reactivation potential for dormant bedrock and glacial deep-seated landslides? If yes, should an assessment to determine the potential for further movement of dormant bedrock and glacial deep-seated landslides be developed and required?

2.3 Should the reactivation potential of relict slides be included in all bullets in sub-part 6.2? (Note: Reference to the 6.2 bullets is now section 6.1.1, step 4 on page 45 of BM Section 16).

Policy Response Status: Policy agreed with the AMPA recommendation for these questions to be considered by UPSAG, with the first question about existing science now being addressed in the literature reviews mentioned above. In August 2016, Policy also recommended that UPSAG assess, in a meeting, the adequacy of specific language in the Board Manual defining relict and dormant as pertaining to DSL and whether the reactivation potential of relict landslides should be further recognized in the BM 16 Section 6. A report was presented from UPSAG to Policy in March 2017 reflecting disagreement on both these questions.

Recommended Next Steps: Policy did not take action based on the non-consensus March UPSAG report, and is awaiting the completion of the non-glacial DSL literature review

Component 3: Dr. Anne Weekes Landslide Screening Tool for Complex or composite rotational deep-seated landslide assessment

Task: Policy track –

The AMPA recommended that Policy address the following questions

> *3.1 Is there a need for a precautionary screening technique to identify landslides and other potentially unstable landforms that may not appear on contemporary landslide maps?*

AMPA/Policy Response: Policy accepted the AMPA recommendation for this question to be discussed at Policy to decide whether it should be added to the Board Manual, and if 'yes', work with a technical group to define what is needed.

The Policy subgroup discussed this issue at some length. The Conservation Caucus disagrees about how this question is framed. The Conservation Caucus did not perceive the proposal of a screening tool as adding a level of precaution that exceeds full implementation of the existing rules. Also, the Conservation Caucus believes the context for this task has changed somewhat given the final content of the Board Manual, including incorporation of improved qualitative LiDAR based screening techniques.

Recommended Next Steps: Policy recommends no further action on this item pending outcomes from the DSL Research Strategy.

> *3.2.A. What is the likelihood of an increase in the frequency of composite failures in rotational deep-seated slides due to projections of a rise in the magnitude and duration of precipitation caused by atmospheric rivers and diminished mid-elevation snow transitioning into rain during the winter months?*

> *3.2 B. What effect would an increase in atmospheric precipitation have on overland flow, stream capture and groundwater? What would this increased water have on the unconsolidated hummocky topography characteristics of large rotational slides?*

Policy Response Status: Policy agreed with the AMPA recommendation that these two questions be considered by UPSAG, and that a literature review evaluate the science around these complex covariates. The AMPA also recommended that UPSAG consider whether a TWIG should be formed to develop a study to identify those characteristics of large landslides that may predispose them to failure modes that include long rapid runout and to develop methods to improve prediction if the topographical signature of a rotational slide indicates a landform likely to fail as a composite slide.

In May 2016, UPSAG recommended against forming a TWIG related to this issue, and generally recommended that Policy address the other PI questions prior to addressing this one.

Subgroup discussions addressed several concerns around this issue. The Conservation Caucus maintained its position that the Board Manual does not give adequate attention to climate change, and that reasonable practitioner assumptions about precipitation must be

based on current thinking around expected future weather patterns because they are projected to differ significantly from past weather patterns.

Recommended Next Steps: The subgroup recommends consulting with UPSAG to determine whether a limited scope literature review related to the potential impacts from climate change on landslides makes sense. This information will assist in answering the question of how climate information could be included in a Board Manual to assist in evaluation of forest practices proposals. The subgroup is also interested in understanding how climate change is addressed in geologist training, reporting and licensing. (RCW 18.220 geologist licensing).

Component 4: Shallow-rapid landslide coarse screen

Task: *Address the following questions. Track: Policy*

1. *A. Is there a need to include a shallow-rapid landslide coarse screen for general practitioners or Qualified Experts?*

   B. If yes, how prescriptive is the proposed shallow- rapid coarse screen based on the Tolt Watershed? Is it appropriate for guidance? For rule?

Policy response status: The AMPA Recommended that this question be discussed at Policy to decide whether or not a coarse screen should be added to the Board Manual. Policy made a specific recommendation in August 2016 that CMER/UPSAG address the potential for such a tool to be developed, which the Board approved. In February 2017, UPSAG reported to Policy that it did not reach agreement on the need for a shallow-rapid coarse screen in its report to Policy of February 2017, although it did provide an estimate of the work required to develop such a screen.

Like UPSAG, the Policy subgroup is not in consensus on the need for a shallow-rapid slide coarse screening tool and exactly how it is proposed to be used.

Recommended Next Steps:

- The subgroup recommends that Policy hold a full Policy work session at which perspectives on the need for this screen are shared.
- On April 6, Policy approved a research package that addresses some of this concern. Policy accepted the Unstable Slope Criteria TWIG's recommendation to conduct a series of studies that use "existing data and new techniques to provide a suite of options for incrementally updating the current Forest Practices Unstable Slopes rules." (Stewart et. al., "TWIG Best Available Science and Alternatives Analysis, February 22, 2017, 47 pp). These studies will assess whether "modifications to the unstable slopes criteria [RIL} could result in more accurate and consistent identification of those landforms where forest-practices related changes in landslide processes are likely to have an adverse impact to public

resources or public safety." Id

2. Should a TWIG be formed to develop a study to determine what runout distances should be used in a shallow- rapid landslide coarse screen flow chart designed for application in all geographic and geomorphic areas to be used statewide?

Policy Response Status: Per Task 4.1, because there is continued disagreement over the need for a coarse screen, there is no final decision about how the empirical basis for such a screen should be developed. This question has been partially answered in that when UPSAG determined in the spring of 2016 that a new TWIG was not needed, and that this task "may be able to tie in with Unstable Slopes Criteria TWIG". This issue is addressed by the research options accepted by Policy in April.

3. If a shallow-rapid landslide coarse screen is developed, should the Board consider establishing an acceptable level of risk? If yes, could it potentially result in over- or underestimations resulting in inappropriately over- or underutilizing expert analysis? On the latter point, Paul Kennard has scoped a possible study design, a "runout-risk evaluation tool" that may be suitable for Adaptive Management Program study. See Paul Kennard Declaration, pages 9-11.

Policy Response Status: The AMPA recommended a joint UPSAG/Policy discussion of the pros and cons of assigning probability associated with risk. If 'yes', then UPSAG will need to develop a study to develop and/or refine such a tool.

Recommended Next Steps: This issue is addressed in one component of the research program approved by Policy in April: empirical evaluation of runout from mapped landslides is proposed to assist with characterization of delivery potential on various landforms.

Component 5: Run-Out Path Analysis: Methods for Deep-seated Landslide Runout Assessment

5.1: Policy. *Given the level of review and the required analyses and protection criteria listed in the rules, where public safety may be impacted is there a need to develop an additional precautionary runout principle, including a more conservative (further) runout distance, for deep-seated landslides?*

Policy Response: The AMPA recommended that this "fundamental issue" be resolved through Policy discussion, potentially seeking input from UPSAG "to better understand how avoidance and the precautionary principle work in concert

In the subgroup, there was some consternation from the Conservation Caucus about the framing of this issue, and the deletion of the word "precautionary" from the question was recommended. The Conservation Caucus proposal on runout analysis was intended to illustrate actual runout distances for consideration in risk analysis, not to add some

arbitrary or 'precautionary' distance to estimate potential runout. The Conservation Caucus believes that the policy objective of avoidance is generally believed to be adequate to protect public safety, with the question of interest being what constitutes effective avoidance.

Recommended Next Steps: Policy recommends continuing to proceed along Science Track (below), and awaits the result of the non-glacial literature review.

***Task 2: Science**. Do scientifically-derived methods exist for predicting the potential for deep-seated landslide failure? a. If yes, is it appropriate to incorporate additional guidance in the manual? What guidance and for whom – the general practitioner, the qualified expert, or both? b. If no, is it appropriate to incorporate any additional guidance in the manual? What guidance and for whom – the general practitioner, the qualified expert, or both?*

Policy Response Status: The AMPA believed a thorough literature review was necessary of both glacial and non-glacial features, to which both Policy and the Board agreed. After completion of the non-glacial literature review in June 2017, Policy will initiate a conversation with UPSAG to determine the benefits of additional guidance.

Recommended Next Steps: Policy will review the DSL Research strategy to be presented by UPSAG later this year, which will be informed by the non-glacial literature review to be completed this summer.

Component 6: Policy Track. Landslide Risk Flow Chart, title of document proposed for inclusion Landslide Risk Decision Pathway

Task 6.1. Address this question: Do the existing forest practices rules, forest practices application review process flow charts (Attachment B), and Board Manual Section 16 provide a landslide hazard risk decision pathway? Based on the previous review, is there a need for a landslide hazard risk decision pathway? If the decision is to develop a landslide hazard risk decision pathway should a precautionary risk management principle be added to the decision pathway?

Policy Response Status: The AMPA recommended that Policy consider this question and make a recommendation on whether or not it is necessary for inclusion in Board Manual Section 16, recommending a sub-group of Policy representatives work together between meetings.

Recommended Next Steps: Policy recommends continuing to proceed along Science Track (below)

Task 6.2. Should the definition of Rule Identified Landforms be amended to include a certainty rating based on the likelihood that a failure of the feature would threaten public safety? Or a certainty rating based on threats to public resources or public safety? If yes, how would the threat potential and the levels of certainty be defined?

Policy Response Status: The AMPA recommended that a Policy subgroup consider this question regarding public safety and/or public resources by discussing uncertainty and risk and how to capture these differences in a rating system and returning a proposal to full Policy

Recommended Next Steps: The Policy subgroup has not determined next steps on this component of the PI because there is not consensus on what a "certainty" rating would include or how it would be developed. At this time, Policy recommends simply moving forward expeditiously on the Unstable Slopes Criteria project approved in April.