

ELK RIVER ROWD - APPENDIX B

Excerpted from Humboldt Redwood Company Habitat Conservation Plan

August 1, 2015

6.3.3 Control of Sediment from Roads and Other Sources^{1, 2}

6.3.3.1 Road Sediment Assessment and Planning (Revised August 1, 2011)

1. HRC shall assess the existing network of roads and associated sediment sources on its lands within ten years of the issuance of the ITP. Roads are defined for the purposes of Section 6.3.3 as including landings. Assessment of individual road segments shall be conducted within five years prior to the planned stormproofing. Road assessments will be conducted according to Pacific Watershed Associates protocols (HCP, Attachment 3) or a protocol proposed by HRC and approved by the Agencies. Initial road assessments must be completed for entire watersheds in the following order:

Elk River, Freshwater Creek, Lawrence Creek, Yager Creek (including Lower, North Fork, Middle, and South Fork), Van Duzen River, Middle Fork Eel River, Larabee/Sequoia Creek, Mattole River, Salmon Creek, Bear River.

2. Adjustments to the priority list above shall be made in consultation with the Wildlife Agencies.
3. HRC shall develop an annual road work plan. This plan shall include a prioritization and scheduling of stormproofing activities, a description of road work conducted in the previous year and road work anticipated to be conducted during the next 12 month period, beginning April 15. The plan shall also include maps and/or reports, as appropriate, with the following elements:
 - 3.1. Roads that have been closed or decommissioned,
 - 3.2. Locations of roads assessed and already stormproofed,
 - 3.3. Location, explanation, and justification of alternative measures undertaken in the previous year that result in less potential sediment delivery to Waters compared to prevention of diversion.
 - 3.4. Locations of roads anticipated to be stormproofed during the next 12-month period beginning May 1,
 - 3.5. Sites anticipated to be stormproofed and their priority ranking,
 - 3.6. Dates when roads were assessed according to Item 1, above,
 - 3.7. Locations of anticipated road construction and reconstruction,
 - 3.8. Roads that are anticipated to meet the standard of a permanent road, and
 - 3.9. Other information as appropriate.

This annual plan shall be provided to the Signatory Agencies by April 15 for review. Stormproofing sites shall be prioritized as per Pacific Watershed Associates protocols (HCP, Attachments 3) or a protocol proposed by HRC and approved by the Agencies.

¹ This section was revised in its entirety by Adaptive Management dated 8/17/04. Changes allowed for greater operational flexibility while maintaining or enhancing protection of aquatic habitat over that provided by the original operating measures of the HCP.

² This section was again revised in its entirety by Minor Modification, approved by CDFG 19 August 2011 and made effective 8 November 2011 upon approval by NMFS and USFWS; the revision date is 1 August 2011. Changes provided clarity to vague or conflicting language, and introduced new measures designed to achieve greater operational flexibility while providing a similar, if not greater, overall level of protection and mitigation for the aquatics environment.

6.3.3.2 Road Stormproofing (Revised August 1, 2011)

1. Stormproofing will be completed on 750 miles within the first decade following issuance of the ITP and on an additional 750 miles in the second decade following issuance of the ITP. Stormproofing shall be completed at a minimum average rate of 75 miles per year. HRC can request that NMFS grant an exemption in writing from the requirement to maintain a minimum average of 75 miles per year based on lack of work time due to atypical summer wet weather patterns or the repair of an unusually high number of Water crossings. Such an exemption will be granted on showing of good cause. All stormproofing shall be completed within 20 years of the issuance of the ITP.
2. Roads shall be stormproofed according to the definition and criteria in Section 6.3.3.9 and to the standards identified in Weaver and Hagans (1994).
3. To the extent feasible, given logistics and the cost of moving equipment, HRC will stormproof the worst sites, i.e., those most likely to fail or deliver the greatest volume of sediment to Waters, in the first 10-year period following issuance of the ITP.
4. Stormproofing identified in and conducted as part of THPs shall count towards the yearly and per-decade totals. Stormproofing completed to the standards identified in Weaver and Hagans (1994) prior to issuance of the ITP shall also count towards the first decade totals. Roads that are closed or decommissioned according to the standards in Weaver and Hagans (1994) and that have the attributes presented under the definition of “stormproofed road” in Section 6.3.3.9 shall also be considered stormproofed and can be counted towards the yearly and per-decade totals.
5. Stormproofing conducted between May 1 and October 14, inclusive, shall not occur when saturated soil conditions exist within the hydrologically-connected road segment or when the Weather Forecast (defined in 6.3.3.9 Item 13) is a “chance” of precipitation equal to or greater than 30% on that day or as forecast for the next day, predicted on the same-day early morning forecast. Operations shall cease and not resume as long as saturated soil conditions within the hydrologically-connected road segment are evidenced.
6. Stormproofing conducted between October 15 and April 30, inclusive, shall adhere to the conditions and measures defined in Section 6.3.3.3 Item 6.
7. Refueling of equipment and vehicles will be done outside of RMZs and Water crossings. Adding or draining lubricants, coolants, or hydraulic fluids will not be done in RMZs and Water crossings and all such fluids shall be properly disposed.
8. During and after stormproofing operations there shall be no resulting visible increase in turbidity in any receiving Class I, II, or III Waters.
9. When used in this Plan, the term stormproofing describes a process that involves the following elements:
 - 9.1 The assessments follow the Pacific Watershed Associates protocols (HCP, Attachment 3) or a protocol proposed by HRC and approved by the Agencies. A trained observer assesses a road segment and identifies actual or potential occurrences of erosion, slippage, mass wasting, blocked or perched culverts, or other sediment sources. The assessment documents, including but not limited to, instances of Humboldt crossings, unstable fill slopes for roads, Water crossings that have a moderate to high potential for culvert blockage and/or diversion of stream flows onto the road bed, insufficient drainage, and diversions of road drainage into Waters.

- 9.2 The likelihood that each identified feature will deliver sediment to Waters shall also be evaluated as part of the road assessment, and the total volume of sediment that could be prevented from delivery to a Water is estimated.
- 9.3 Based on the volume of sediment saved and the likelihood of delivery, sites are assigned a high, medium, or low priority and scheduled for corrective action based on a prescribed treatment plan. Corrective action typically requires an excavator, bulldozer, and one or more dump trucks to dig up and replace Water crossings, install drainage structures, remove unstable fill, alter the road bed to reduce the potential for diversion of flows on to the road surface, and install rolling dips and/or water bars to route water and sediment.
- 9.4 Corrective action, if necessary, is completed, the road has the attributes of a stormproofed road, and the roads database and GIS layer is updated to show the road has been stormproofed.

6.3.3.3 Road Construction, Reconstruction, and Upgrades (Revised August 1, 2011)

1. Constructed and reconstructed roads shall:
 - 1.1. Meet specifications of a stormproofed road;
 - 1.2. Be single-lane width with periodic turnouts compatible with the type of equipment used in management operations and for which the road is built. Multi-lane roads may be permitted if explained and justified and if approved by the Wildlife Agencies following a 30 day review; and
 - 1.3. Have drainage facilities and structures installed at intervals along the road that are no greater than the guidelines in Table 20 of Weaver and Hagans (1994) and frequent enough to disperse road surface runoff so as to avoid gully formation and minimize erosion of the road surface, erosion of inside ditches and other drainage facilities, and erosion at the outfalls of drainage facilities and structures. Water captured by the road shall be diverted onto stable portions of the forest floor that dissipate energy, facilitate percolation, and avoid creating channelized flow or erosion of mineral soil that discharges to Waters.
 - 1.3.1. The drainage facility spacing guidelines in Table 20 of Weaver and Hagans (1994) shall not be exceeded except as provided in Item 1.3.2 below.
 - 1.3.2. In situations where conformance with the spacing requirements of Table 20 is not feasible due to throughcuts, some switchback scenarios, or would result in diverting concentrated runoff to unstable areas, a deviation from the guidelines in Table 20 may occur.
 - 1.3.2.1. Situations where such a deviation is necessary will be reviewed by a Registered Professional Forester or licensed geologist. Best Management Practices³ for minimizing erosion and/or sediment delivery to Waters shall be implemented and maintained to function properly.
 - 1.3.2.2. Any other circumstances justifying exceptions (e.g., do more harm than good) to drainage facility guidelines will be documented and submitted to the Wildlife Agencies as soon as feasible after the work is done, and included in the Annual Road Plan.
2. All THP-related roads shall be upgraded, closed, or decommissioned.
 - 2.1. THP-related road upgrading, closure, or decommissioning shall result in sufficient sediment

³ Best Management Practices may include but are not limited to: installing effective erosion control measures; installing energy dissipaters and/or hillslope armoring at outlets of drainage facilities and structures; installing oversized culvert downspouts that are anchored to the culvert and hillslope; outslowing road segments.

reduction in the planning watershed(s) to offset predicted sediment production from the THP. This requirement to offset sediment production will remain in effect until modified through or superseded by watershed analysis or adaptive management.

- 2.2. Upgrading, closure, or decommissioning shall be completed no later than the time of filing of the THP report of completion of work with the Department of Forestry and Fire Protection. Sites identified as having signs of imminent failure shall be treated as soon as practical after THP approval.
3. Constructed and reconstructed Water crossings on fish-bearing and restorable fish-bearing Waters shall be designed, constructed, and maintained such that they shall allow for unrestricted passage of all life stages of fish. Where culverts are used, fish passage will be ensured by adhering to current crossing design standards developed by NMFS or DFG, or by review and approval of proposed alternate installation measures by NMFS or DFG.
4. Constructed and reconstructed roads shall be located outside RMZs except for RMZ crossings. Construction and reconstruction of roads within RMZs (and EEZs required by an associated steep slope provision) may occur if HRC submits information explaining and justifying why the proposed action would present levels of risk to aquatic resources at least equal to those presented under other feasible alternatives that are allowed under the HCP. Information explaining and justifying the proposed exception shall be provided to the Wildlife Agencies separate from the THP. The Wildlife Agencies shall have up to 60 days to determine if the exception will be allowed. This determination will be based on the likelihood of risk to aquatic resources and avoidance of significant adverse impacts compared with feasible alternatives allowable under the HCP. If any Wildlife Agency determines that the alternative will not be allowed, that Agency will work cooperatively with HRC and the other Wildlife Agencies to develop feasible alternative road locations and/or road specifications that will avoid significant impacts to aquatic resources.
5. No roads will be constructed or reconstructed across inner gorges, headwall swales, unstable areas, or areas having a high, very high, or extreme mass-wasting hazard rating, except as approved following the provisions of the hillslope management mass-wasting strategy in Section 6.3.3.7. Refer to Section 6.3.3.7 for road standards pre- and post-watershed analysis.
6. Construction, reconstruction (including, but not limited to, installation and removal of Water crossings), and upgrading of roads shall not occur during the wet weather period, defined for this purpose as October 15 to May 31, inclusive, unless each of the following conditions exist and measures are applied:
 - 6.1. Saturated soil conditions do not exist within the hydrologically-connected road segment, except as may occur on localized wet spots arising from emergent groundwater. Where such localized wet spots occur within proposed or existing hydrologically-connected road segments they shall be isolated concurrent with operations.
 - 6.2. Construction and reconstruction shall not cross an inner gorge, headwall swale, unstable area, extreme, very high, or high mass-wasting hazard area. Upgrading activities may occur in the above locations if equipment operations are limited to the road surface.
 - 6.3. Within the EEZ of Class I, II or III Waters the following measures shall be applied:
 - 6.3.1. Work will not be initiated on a day if the Weather Forecast (defined in 6.3.3.9 Item 13) is a "chance" of precipitation equal to or greater than 30% on that day, predicted on the same-day early morning forecast.
 - 6.3.2. Erosion control material of sufficient quantity shall be on-site or otherwise accessible (so as to be able to procure and apply that working day) before commencing construction, reconstruction and upgrading.
 - 6.3.3. Hydrologically-connected road segments shall be isolated prior to and concurrent with operations.

- 6.3.4. Exposed mineral soil, except as defined in Section 6.3.3.8 Item 3, shall be treated with effective erosion control measures (1) at the end of the work day if the Weather Forecast (defined in 6.3.3.9 Item 13) is a “chance” of precipitation equal to or greater than 30% before or on the next day, (2) prior to weekend or other shutdown periods, and (3) upon completion of the project.
- 6.3.5. Roads shall be adequately drained to prevent saturated soil conditions caused by inadequate drainage of the road prism. Drainage measures shall be installed concurrent with described activities. An exception is that waterbreaks do not need to be constructed on roads in use, provided that waterbreaks are installed at the end of the work day, if the Weather Forecast (defined in 6.3.3.9 Item 13) is a “chance” of precipitation equal to or greater than 30% before or on the next day, and prior to weekend or other shutdown periods.
- 6.4. Construction, reconstruction (including, but not limited to, installation and removal of Water crossings), and upgrading of Class II and III Water crossings shall be subject to all of the following conditions and measures.
 - 6.4.1. HRC shall submit a work plan to the Wildlife Agencies for proposed crossing construction or reconstruction (including, but not limited to, installation and removal of Water crossings). This submittal may be concurrent with application for a streambed alteration agreement. The work plan shall include a map depicting the location of proposed work and a written description that details the location, timing, type, and extent of work proposed. The Wildlife Agencies may require modification to the proposed work plan. HRC shall not carry out the proposed activity without approval of the Wildlife Agencies. The Wildlife Agencies shall have a maximum of 30 days to approve, approve with modifications, or deny the proposed work plan. The approved work plan shall be made enforceable under any applicable THP prior to the proposed activity occurring.
 - 6.4.2. Work will not be initiated on a day if the Weather Forecast (defined in 6.3.3.9 Item 13) is a “chance” of precipitation equal to or greater than 30% on that day or as forecast for the next day, predicted on the same-day early morning forecast.
 - 6.4.3. Waters shall be dry or have no more volume of water than can be effectively diverted around the work area by the shortest distance possible utilizing a 6 inch diameter pipe.
 - 6.4.4. Erosion control material of sufficient quantity shall be stockpiled on-site or otherwise accessible (so as to be able to procure and apply that working day) before Water crossing installation and removal.
 - 6.4.5. Any Water crossing installed shall be sized to accommodate the estimated 100-year flow.
 - 6.4.6. All Water crossing construction, reconstruction, upgrading or removal work shall be conducted in one day. If equipment breakdowns prevent the completion of work in one day, work will be completed in the shortest period feasible.
- 6.5. Construction, reconstruction (including, but not limited to, installation and removal of Water crossings), and upgrading of Class I Water crossings shall be subject to all of the following conditions and measures.
 - 6.5.1. HRC shall submit a work plan to the Wildlife Agencies for proposed crossing construction or reconstruction (including, but not limited to, installation and removal of Water crossings). This submittal may be concurrent with application for a streambed alteration agreement. The work plan shall include a map depicting the location of proposed work and a written description that details the location, timing, type, and extent of work proposed. The Wildlife Agencies may require modification to the

proposed work plan. HRC shall not carry out the proposed activity without approval of the Wildlife Agencies. The Wildlife Agencies shall have a maximum of 30 days to approve, approve with modifications, or deny the proposed work plan. The approved work plan shall be made enforceable under any applicable THP prior to the proposed activity occurring.

- 6.5.2. Class I crossings shall not be constructed or reconstructed (including, but not limited to, installation and removal of Water crossings) after November 15 and prior to May 1.
 - 6.5.3. Work will not be initiated on a day if the Weather Forecast (defined in 6.3.3.9 Item 13) is a “chance” of precipitation equal to or greater than 30% on that day or as forecast for the next day, predicted on the same-day early morning forecast.
 - 6.5.4. All Water crossing construction, reconstruction, upgrading or removal work shall be conducted in one day. If equipment breakdowns prevent the completion of work in one day, work will be completed in the shortest period feasible.
 - 6.5.5. Any crossing installed shall be sized to accommodate the estimated 100-year flow.
 - 6.5.6. Prior to operations, on the day of the crossing installation, a qualified biologist shall survey for the presence of covered fish species and their redds within 100 feet upstream and 100 feet downstream from the crossing.
 - 6.5.7. Crossings may be installed if covered fish species and their redds are not present within 100 feet upstream and 100 feet downstream from the crossing. If covered fish species or their redds are present the crossing may be installed only after consultation with and approval by the Wildlife Agencies.
 - 6.5.8. If fill material needs to be placed within the channel or on the banks of the Water during bridge installation it shall be screened gravel, river run gravel, or logs or any combination thereof. Materials used as fill shall cause no siltation.
 - 6.5.9. Low water bridges need not accommodate the estimated 100-year flow.
7. During and after construction, reconstruction, and upgrading there shall be no resulting visible increase in turbidity in any receiving Class I, II, or III Waters.
 8. Refueling of equipment and vehicles will be done outside of RMZs and Water crossings. Adding, draining, or depositing lubricants, coolants, or hydraulic fluids will not be done in RMZs and Water crossings and all such fluids shall be properly disposed.
 9. All applicable measures set forth in any associated Streambed Alteration Agreement shall be implemented.
 10. A federal permit violation has not occurred if an activity that results in a unavoidable input of sediment to Waters occurs, even though all wet weather and construction, reconstruction and upgrade requirements were properly followed, in addition to all required erosion control measures being properly installed. This does not relieve HRC of any other requirements under other applicable federal and state laws.

6.3.3.4 Road Maintenance (Revised August 1, 2011; July 7, 2015)

1. Maintenance needs identified between April 1 and October 14, inclusive, will be performed prior to October 15.
2. Inboard ditches shall not be bladed or excavated except where blockage or insufficient capacity occurs.
3. Maintenance operations on non-paved roads shall cease when precipitation is sufficient to generate overland flow off the road surface in hydrologically-connected road segments. Maintenance shall not resume until such overland flow has abated and the road surface within hydrologically-connected

road segments does not exhibit saturated soil conditions. This rule shall not prohibit vehicles from exiting the property.

4. During the wet weather period, defined as occurring between October 15 and May 31, inclusive, hydrologically-connected road segments shall be isolated prior to initiation of maintenance operations on any day when the Weather Forecast (defined in 6.3.3.9 Item 13) is a “chance” of precipitation equal to or greater than 30% on that day, predicted on the same-day early morning forecast, or when maintenance activities are likely to deposit mineral soil or road material over fill slopes of crossings. Effective erosion control measures shall be applied upon completion of maintenance operations. This requirement does not apply in emergency situations involving threats to human safety or road-related problems in the form of blocked culverts, imminent road fill failure, or other erosion problems which must be corrected to prevent or minimize significant adverse effects to the aquatic resource. Upon completion of emergency operations within hydrologically-connected road segments, effective erosion control measures shall be applied.
5. Refueling of equipment and vehicles will be done outside of RMZs and Water crossings. Adding, draining, or depositing lubricants, coolants, or hydraulic fluids will not be done in RMZs and Water crossings and all such fluids shall be properly disposed.

6.3.3.5 Road Inspections (Revised August 1, 2011; July 7, 2015)

1. All roads shall be inspected to identify maintenance needs at least once annually between April 1 and October 14, inclusive, to ensure that drainage structures and facilities are in proper condition. The Wildlife Agencies may exempt specific roads from inspection based on an evaluation of the risk of impacts caused by repair versus risk of impacts associated with failure or the timing of inspection completed prior to April 1.
2. All roads shall be inspected to identify maintenance needs, as soon as conditions permit, following any storm event that generates 3 inches or more of precipitation in a 24-hour period, as measured at the Scotia rain gauge. Multiple inspections during the winter period are encouraged. The Wildlife Agencies may waive this requirement based on the timing of the storm event in relation to the annual inspection period of April 1 to October 14, inclusive.
3. Roads that cannot be inspected, excluding those exempted by the Wildlife Agencies, during any one of the annual inspections between April 1 and October 14, inclusive, must be closed or decommissioned according to guidelines provided by Weaver and Hagans (1994). This work must be conducted within the same timeframe as stormproofing, as per HCP Section 6.3.3.2.
4. Closed and decommissioned roads shall be inspected after the first five-year storm event or five years after completion of work, whichever comes first, to ensure that treatments restore natural drainage and hillslope stability. If treatments have not restored natural drainage or hillslope stability, additional treatment shall occur if the volume of sediment prevented from entering a channel by additional treatment is greater than that incurred by re-entering the site. Additional treatments identified between April 1 and October 14, inclusive, shall be implemented prior to October 15. Additional treatments identified between October 15 and April 30, inclusive, shall be implemented between the next April 1 and October 14, inclusive, unless a lack of treatment constitutes an imminent threat to aquatic resources.
5. Documentation of annual inspection efforts will be provided to the Wildlife Agencies and CAL FIRE on the same schedule as the monitoring reports. Annual inspection logs will be made available to the Wildlife Agencies and CAL FIRE upon request.

6.3.3.6 Wet Weather Road Use Restrictions (Revised August 1, 2011)

1. All hauling (including logs, heavy equipment and/or rock), construction, reconstruction, and maintenance operations on non-paved roads shall cease when precipitation is sufficient to generate overland flow off the road surface in hydrologically-connected road segments. Use of the road shall not resume until such overland flow has abated and the road surface within hydrologically-connected

road segments do not exhibit saturated soil conditions. This rule shall not prohibit vehicles from exiting the property. In addition, when road use ceases due to the above condition, log trucks at an active landing may be loaded and may exit the property. Log trucks returning to active landings when road use ceases due to the above condition shall be required to exit the property and shall not be loaded.

2. The wet weather period is defined as occurring between October 15 and May 31, inclusive.
3. On roads that do not meet the permanent standard, once hauling operations have ceased during the wet weather period due to Item 1, above, they shall not resume until June 1 or the road meets the permanent standard.
4. On roads that meet the permanent standard:
 - 4.1. Hauling operations during the wet weather period, in addition to complying with Item 1, above, shall cease when any of the following conditions exist:
 - 4.1.1. When previously hydrologically-disconnected road segments become hydrologically-connected road segments;
 - 4.1.2. When there is standing water within hydrologically-connected road segments;
 - 4.1.3. When equipment operation causes rutting to the extent that the ruts direct runoff from the road to discharge into a Water; or
 - 4.1.4. When equipment operation results in the transportation of sediment from hydrologically-disconnected road segments to hydrologically-connected road segments in amounts that result in a visible increase in turbidity in receiving Waters.
 - 4.2. When hauling operations during the wet weather period have ceased due to Item 4.1, above, they shall not resume until:
 - 4.2.1. All hydrologically-connected road segments have been isolated; and
 - 4.2.2. Maintenance has corrected the condition under Item 4.1, which resulted in cessation of hauling, and the road meets the permanent standard.
 - 4.3. When hauling operations during the wet weather period have ceased due to Item 4.1 above and hauling will not be resumed, then the road shall be returned to the upgraded standard as soon as practicable. If repairing damage requires heavy equipment, such that the effort would cause greater harm than good, then HRC shall treat the site with feasible effective erosion control measures as an interim measure.
5. During the wet weather period, all roads may be used by light vehicles (defined as vehicles with pay load ratings of 1 ton, or less, or smaller vehicles such as quadra-tracks or motorcycles). In addition, all roads may be used by water-tenders (maximum of three axles) providing support to prescribed fire operations undertaken as part of site preparation. If such use results in road-related damage within hydrologically-connected road segments to the road surface, drainage facilities, waterbreaks, or Water crossings, the damage will be repaired using hand tools prior to the end of the workday during which the initial damage occurred. Damage shall not be to such an extent that heavy equipment would be required for repairs.
6. Consistent with federal and state law and regulation, in order to prevent or minimize significant adverse effects to the aquatic resource, emergency access is allowed in order to correct emergency, road-related problems in the form of blocked culverts, imminent road fill failure, or other erosion problems, and emergency human life situations.

6.3.3.7 Hillslope Management (Revised February 22, 2006⁴; updated August 1, 2011)

The hillslope management mass-wasting strategy applies to all portions of HRC's ownership, including the RMZs. The prescriptions in the RMZs for mass wasting will not be less restrictive than the riparian prescription developed as part of watershed analysis, as appropriate and applicable to this Plan. The hillslope management prescriptions may be modified as a result of watershed analysis.⁵

1. Except as described below, HRC shall not harvest, including sanitation salvage, exemption harvest, and emergency timber operations, on mass-wasting areas of concern defined as areas of extreme mass-wasting hazard, very high mass-wasting hazard, high mass-wasting hazard, inner gorges, headwall swales, and unstable areas, including those within the RMZs on Class I, II, and III waters. This restriction may be modified as a result of watershed analysis.

- Harvest may be permitted on mass wasting areas of concern (excluding inner gorges and headwall swales) located completely outside of 170-foot Class I and 130-foot Class II RMZs, provided a geologic analysis of the risk of hillslope failure has been conducted by a licensed geologist and concludes a low likelihood of the proposed timber operations resulting in increased potential for sediment delivery to Class I, II, or III waters. At minimum, the geologic analysis shall include assessment of the following environmental conditions relative to sediment delivery potential:

Geology/soil characteristics

Slope gradient

Slope morphology

Slope connectivity/continuity to nearest watercourse including distance

Potential failure type

Delivery of sediment by analogous features in the area

Absence/presence of emergent groundwater

Response to past management

Proposed management activity

2. Except as described below, HRC will not construct or reconstruct roads across mass-wasting areas of concern defined as areas of extreme mass-wasting hazard, very high mass-wasting hazard, high mass-wasting hazard, inner gorges, headwall swales and unstable areas, prior to watershed analysis.

- Newly constructed and reconstructed roads (not including stormproofing) on mass-wasting areas of concern (defined above) may be permitted prior to watershed analysis if HRC provides the following:

A map of the mass-wasting areas of concern overlaid by all existing roads and all proposed new construction and reconstruction on a planning watershed scale for a one-year timeframe or longer

⁴ Adaptive Management dated 3/2/06 allowed restricted timber harvest on slopes identified as Mass Wasting Areas of Concern (MWAC), with significant restrictions including geologic analysis by a California Licensed Geologist. This has been superseded by Watershed Analysis Prescriptions in all watersheds.

⁵ Prescription language retained in this version as revised by Adaptive Management is no longer current. Post-Watershed Analysis prescriptions are incorporated into the THP Templates.

A geologic analysis of the risk of hillslope failure by the proposed new construction and reconstruction

All the information will be provided to the wildlife agencies who will make a determination if all, some, or none of the proposed road construction or reconstruction will be permitted across the mass-wasting areas of concern. This determination will be based on the proposed road locations, road specifications, and the likelihood of avoidance of significant adverse impacts to covered species. The wildlife agencies will work cooperatively to provide consistent determinations to HRC within 60 days after receipt of the maps and geologic reports as described above. If any of the wildlife agencies determines that the proposed road construction/reconstruction will not be permitted, that agency will work cooperatively with HRC and the other wildlife agencies to develop feasible alternative road locations and/or road specifications or other access methods that will avoid significant impacts to covered species.

3. After watershed analysis, roads may be constructed or reconstructed across inner gorges, unstable areas, headwall swales, or areas having a high, very high, or extreme mass-wasting hazard rating if the watershed analysis indicates that roads across these areas are appropriate. This watershed analysis determination shall include, but is not limited to, an assessment of risk to the aquatic environment by qualified wildlife agency aquatic biologist(s) or aquatic biologists acceptable to the wildlife agencies. If the watershed analysis indicates that roads in these areas are appropriate, the proposed roads and road specifications shall be evaluated, at the time of road design, by qualified professional geologist(s), including, but not limited to, certified engineering geologist(s) licensed by the state of California. The geologist(s) must make a determination that a road and the road specifications are sufficient to result in a stable road prism that is not likely to trigger or exacerbate mass wasting.
4. Road stormproofing, road closure, and road decommissioning of existing roads are acceptable and encouraged on the mass-wasting areas of concern (identified above).
5. Before and/or after watershed analysis, the mass-wasting areas of concern can be further defined on the ground (ground-truthed) with respect to the area boundaries (size) as part of individual THPs. This refinement shall be conducted by the California Geological Survey (CGS) or a qualified professional geologist, including but not limited to, certified engineering geologists licensed by the state of California.
6. The approximately 50,000-acre area that has not yet been characterized for mass wasting shall be treated in the interim, prior to characterization, as a mass-wasting area of concern and shall be correctly characterized with defined boundaries on a THP basis using the same process employed for the entire ownership or watershed analysis. The characterization will be conducted by CGS or a qualified professional geologist, including but not limited to, certified engineering geologists licensed by the state of California.
7. The wildlife agencies and HRC will jointly establish a mass-wasting scientific review panel (MWSRP) to evaluate the definitions of high, very high, and extreme mass-wasting areas of concern. The panel may modify the definitions. The high, very high, and extreme mass-wasting areas of concern will be redelineated for the entire ownership in accordance with any modified definitions.
8. The federal agencies, in consultation with state agencies, will provide a set of criteria to indicate whether mass-wasting events are to be considered significant for aquatic resources for use in the mass-wasting watershed analysis module.
9. Definitions of mass-wasting areas of concern:

Inner Gorge—That area of a watercourse bank situated immediately adjacent to the watercourse channel, having side slope of 65 percent or greater and extending from the edge of the channel upslope to the first break-in-slope (a break-in-slope is defined as a slope less than 65 percent for a distance of 100 feet or more) above the watercourse channel.

Unstable Area—Characterized by slide areas or by some or all of the following: hummocky topography consisting of rolling bumpy ground, frequent benches, and depressions; short irregular surface drainages that begin and end on the slope; tension cracks and head wall scarps; slopes that are irregular and may be slightly concave in the upper half and convex in the lower half from previous slope failure; evidence of impaired groundwater movement resulting in local zones of saturation within the soil mass which are indicated at the surface of sag ponds with standing water, springs, or patches of wet ground. Some or all of the following may be present: hydrophytic vegetation prevalent; leaning, jackstrawed, or split trees are common; pistol butted trees with excessive sweep may occur in areas of hummocky topography (leaning and pistol butted trees should be used as indicators of unstable areas only in the presence of other indicators).

Headwall Swale—A concave depression, with convergent slopes of 65 percent or greater, that is connected to waters via a continuous linear depression (a linear depression interrupted by a landslide deposit is considered continuous for this definition).

High, Very High, and Extreme Mass Wasting Hazard Areas—Refer to the July 1998 Draft HCP, Volume II, Part D, Landscape Assessment of Geomorphic Sensitivity for the sensitivity ratings and to Volume V, Map 13.

6.3.3.8 Measures to Minimize Surface Erosion in Riparian Areas (Revised August 1, 2011)

1. Within RMZs and EEZs, areas of mineral soil exceeding 100 contiguous square feet in size that have been exposed by forestry activities other than site preparation shall be treated with effective erosion control measures as defined in 6.3.3.9 Item 1. Treatment shall be completed prior to October 15, except that such bare areas created after October 14 and before June 1 shall be treated at the end of the work day if the Weather Forecast (defined in 6.3.3.9 Item 13) is a “chance” of precipitation equal to or greater than 30% before or on the next day as predicted on the same-day early morning forecast, and prior to weekend or other shutdown periods, and upon completion of the project. Areas of exposed mineral soil resulting from site preparation operations shall be treated as per HCP Section 6.3.4.2.2 Item 13.
2. Within RMZs and EEZs, areas of mineral soil on hillslopes greater than 30 percent that have been exposed by forestry activities other than site preparation shall be treated with effective erosion control measures as defined in 6.3.3.9 Item 1. Treatment shall be completed prior to October 15, except that such bare areas created after October 14 and before June 1 shall be treated at the end of the work day if the Weather Forecast (defined in 6.3.3.9 Item 13) is a “chance” of precipitation equal to or greater than 30% before or on the next day as predicted on the same-day early morning forecast, and prior to weekend or other shutdown periods, and upon completion of the project. Areas of exposed mineral soil resulting from site preparation operations shall be treated as per HCP Section 6.3.4.2.2 Item 13.
3. The requirement to treat exposed mineral soil does not apply to the road surface or inside ditches. In addition, road cutslopes exceeding 65% do not need to be treated where straw mulch and/or seeding treatment measures are not feasible.
4. Cable corridors, firelines, and skid trails that divert or carry water away from the natural drainage pattern or channelize runoff such that it reaches Waters shall have waterbreaks installed at intervals per Section 914.6(c), Title 14, CCR.

6.3.3.9 Glossary of Terms Used in HCP Section 6.3.3 (Added August 11, 2004 and Revised August 1, 2011)

1. **Effective Erosion Control Measures** – are measures that prevent a visible increase in turbidity

in receiving Class I, II, and III Waters and measures that minimize, to the extent feasible, the delivery of sediment to receiving Class I, II, and III Waters. These measures are maintained until the associated project site is no longer subject to surface erosion arising from exposure of bare mineral soil. Measures which the Wildlife Agencies find do not meet the above performance criteria shall not be considered effective erosion control measures.

2. **Feasible** – means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technical factors.
3. **Gully** – An erosion channel, which is larger than 1 square foot in cross sectional area and is formed by concentrated surface runoff.
4. **Hydrologically-Connected Road Segment** – Is a road segment from which road runoff is delivered to a Water. These segments are typically located over Water crossings.
5. **Hydrologically-Disconnected Road Segment** – Is a road segment from which road runoff is not delivered to a Water. Hydrologically disconnecting a road segment is accomplished by the following: 1) installing drainage facilities and structures at sufficient intervals to minimize the volume of water being discharged from the road surface at any given point; 2) installing the last drainage facility up grade from the Water crossing where water can be discharged off the road without entering the Water via overland flow; and 3) diverting water that has been captured by the road onto stable portions of the forest floor that dissipates energy, facilitates percolation, and resists channelization.
6. **Isolated** – Is a condition (Treatment) in a hydrologically-connected road segment where effective erosion control measures are established prior to proposed operations and maintained concurrent with proposed operations. Examples of measures taken to isolate a hydrologically-connected road segment include, but are not limited to installation of silt fences, rock check dams in inside ditches, and hay bale filter traps. Areas requiring isolation typically occur at Water crossings.
7. **Permanent Road** –Is a road that has a surface adequate for hauling of forest products in non-wet weather periods, and in extended dry periods occurring during the wet weather period. A permanent road shall be an upgraded road and shall have a firm rocked, chipsealed, or paved surface on hydrologically-connected road segments, road segments within 150 feet of a Water, and road surface segments that drain to points within 150 feet of a Water. Operation of equipment shall not deform the surface such that hydrologically-disconnected road segments convey water to a hydrologically-connected road segment, or ruts in hydrologically-connected road segments direct runoff from the road to discharge into a Water, or there is standing water within a hydrologically-connected road segment (typically located over Water crossings). Permanent roads shall be maintained to minimize the delivery of fine sediment from their surfaces and drainage facilities during periods of operation specified in Section 6.3.3.6.
8. **Road Maintenance** – those road activities undertaken 1) to keep a safe and firm road surface and 2) to keep road drainage facilities, structures, fillslopes, and cutslopes in a condition to protect the road and minimize sediment discharge to Waters. Examples of road maintenance include, but are not limited to, shaping and/or rocking a road surface, increasing the capacity of inboard ditches, removing blockages of inboard ditches, cross drains, or culverts, and repairing water bars.
9. **Saturated Soil Conditions** – means that soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during timber operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.
10. **Stormproofed Road** – Stormproofed roads shall be designed, constructed and maintained to minimize the delivery of fine sediment from roads and road drainage facilities to Waters, as well as to minimize, to the extent feasible, sediment discharge to Waters resulting from large magnitude, infrequent storms and floods. Stormproofed roads shall have all the attributes of an upgraded road

and, at minimum, shall have all of the following additional attributes and shall have been treated, where necessary, as described in the following: (a) Unstable materials on fillslopes and cutbanks shall be stabilized or removed at all sites where field evidence indicates the material is subject to failure in the event of a storm (or flood) of low frequency and high magnitude. (b) Water crossings and associated fills and approaches shall be constructed or maintained to prevent diversion of flow down the road and to minimize erosion should the drainage structure become obstructed. Alternative measures that result in less potential sediment delivery to Waters compared to prevention of diversion may be undertaken if mapped, explained, and justified in the annual road plan. (c) Permanent Water crossings shall be sized to accommodate the estimated 100-year flood flow and to accommodate associated debris and sediment loads. A road shall be designated as stormproofed when it has been assessed using the Pacific Watershed Associates protocol (HCP, Attachment 3) or a protocol proposed by HRC and approved by the Wildlife Agencies, has been treated where necessary, has the attributes of a stormproofed road as described above, and the roads database and GIS have been updated to show that the subject roads have been stormproofed. The roads database and GIS shall disclose the extent of stormproofed road segments, and the dates when roads were assessed and treated.

11. **THP-related roads** – include: 1) roads within the THP boundary; and 2) roads that are appurtenant to the THP within the planning watershed(s) in which the THP is located. THP-related roads do not include those road segments within the THP boundary that are not used for timber operations and for which the risk of sediment discharge to Waters as a result of accessing and upgrading the road segments is greater than taking no action until the road is stormproofed.
12. **Upgraded Road** – An upgraded road is one that minimizes the amount of water delivered from the road drainage to Waters and shows no signs of imminent failure (e.g., as evidenced by slumping scarps or cracks in the road fill) that are likely to occur in the upcoming winter that could deliver sediment to a Water. An upgraded road shall have the following attributes and shall have been treated as described in the following: (a) The length of each hydrologically-connected road segment is minimized, to the extent feasible. (b) Except as provided in 6.3.3.3 Item 1.3.2, drainage facilities and structures shall be installed at intervals along the road that are no greater than the guidelines in Table 20 of Weaver and Hagans (1994) and frequent enough to disperse road surface runoff so as to avoid gully formation and minimize erosion of the road surface, erosion of inside ditches and other drainage facilities, and erosion at the outfalls of drainage facilities and structures. (c) Water captured by the road shall be diverted onto stable portions of the forest floor to dissipate energy and facilitate percolation to avoid creating channelized flow or erosion of mineral soil that discharges to Waters. (d) The surface of hydrologically-connected road segments shall be treated (e.g. with rock, chipseal or pavement) to avoid any visible increase in turbidity in Waters receiving runoff from the road surface of these road segments. (e) Upon removal, temporary crossings shall be excavated to form a channel that is as close as feasible to the natural channel grade and orientation, and that is wider than the natural channel to minimize bank and channel erosion. Excavated side slopes shall be laid back to a 2:1(50%) or natural slope. (f) Unstable earth on fillslopes and cutbanks shall be stabilized or removed at sites showing signs of imminent failure that could deliver sediment to a Water. (g) Water crossings and associated fills and approaches shall be constructed or maintained to prevent diversion of flow down the road and to minimize erosion should the drainage structure become obstructed. Alternative measures that result in less potential sediment delivery to Waters compared to prevention of diversion may be undertaken if mapped, explained, and justified in the related THP (a reference to justification in the first exempted THP may be used for subsequent THPs).
13. **Weather Forecast** – The forecast from the Eureka, CA NOAA web site, using locations agreed upon by HRC and the wildlife agencies.