

BOARD OF FORESTRY & FIRE PROTECTION

“ROAD RULES, 2012” FIELD TRIP #1

“Hydrologic Disconnection means the removal of direct routes of drainage or overland flow of road runoff to a watercourse or lake by directing drainage or overland flow on to stable portions of the forest floor to dissipate energy, facilitate percolation, and resist or prevent erosion or channelization.”

“Stable Operating Surface means a road or landing surface that can support vehicular traffic and has structurally sound road base appropriate for the type, intensity and timing of intended use.”

The Board wishes to express its sincere thanks and appreciation to the staff and management of *Jackson Demonstration State Forest* and *The Conservation Fund* for field site identification, public access, and supporting materials.



Site #1: JDSF Road 350. Crown-shaped and surfaced with recycled road asphalt (in cooperation with Caltrans); completed in 2003.

Discussion Points/Questions:

- Does vegetated ditch condition satisfy “hydrologic disconnection” requirement?
- Is crowning and surfacing of road adequate to maintain stable operating surface consistent with permanent road designation?
- Is improvement of hydrologic disconnection necessary and appropriate?
- What questions or concerns are likely to be expressed during a Pre-Harvest Inspection?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions of “crowning,” “permanent road,” “road maintenance,” pgs. 4, 6, 7 of Rule Text.
- § 923. Intent for Logging Roads..., p. 22.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.6. Use of Logging Roads..., p. 60.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.



Site #2: Road 350. Large fill over 36 inch CMP (historically stable) with extensive sediment slug above culvert.

Discussion Points/Questions:

- Is culvert replacement necessary?
 - How would proper culvert sizing for 100 yr. flow, wood, and sediment be determined?
 - Removal or retention of sediment slug – best option?
- Is this location a “significant existing or potential erosion site?”
 - Options for energy dissipation at culvert outlet?
 - Likely PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- Definition of “significant existing or potential erosion site,” § 895.1. p. 9.
- § 923.11. Logging Road Watercourse Crossing Design..., p. 77.
- § 923.13. Logging Road Watercourse Crossing Reconstruction, p. 80.
- § 923.14. Logging Road Watercourse Crossing Erosion Control, p. 83.
- § 923.16. Logging Road Watercourse Crossing Maintenance and Monitoring, p. 86.



Site #3: Road 350 – Road within Class I WLPZ for South Fork of Noyo River.

Discussion Points/Questions:

- Legacy road in a Class I WLPZ – options for and enforcement of hydrologic disconnection?
- Adequacy of vegetative filter strip and energy dissipation options?
- Adequacy of road surfacing – cosmetics v. potential for significant sediment discharge? Is additional rocking necessary and appropriate at this location?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.6. Use of Logging Roads..., p. 60.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.
- § 923.11. Logging Road Watercourse Crossing Design..., p. 77.
- § 923.13. Logging Road Watercourse Crossing Reconstruction, p. 80.
- § 923.14. Logging Road Watercourse Crossing Erosion Control, p. 83.
- § 923.16. Watercourse Crossing Maintenance and Monitoring, p. 86.



Site #4: JDSF Road 350. “Trillium Crossing.”
Unnamed tributary to South Fork of Noyo River.

New 6 ft CMP installed for 200-400 ft of restorable Class I habitat.
[Cooperation with DFG]

Discussion Points/ Questions:

- Previous crossing problems – what prompted replacement?
- Culvert v. bridge determination.
- How was proper culvert sizing for 100 yr. flow, wood, and sediment determined?
- Cost-benefits of replacement?

- Installation techniques-below grade for natural bottom.
- Was need for critical dip mitigated by culvert size and armoring?
- Outcomes to date?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 923.10. Planning for Logging Road Watercourse Crossings, p. 75.
- § 923.11. Logging Road Watercourse Crossing Design..., p. 77.
- § 923.13. Logging Road Watercourse Crossing Reconstruction, p. 80.
- § 923.14. Logging Road Watercourse Crossing Erosion Control, p. 83.
- § 923.16. Watercourse Crossing Maintenance and Monitoring, p. 86.



Site #5: JDSF Road 300. CMP replacement with rock armoring of fill slope. Road within Class I WLPZ for South Fork of Noyo River.

Discussion Points/Questions:

- Pros and Cons of moving road out of WLPZ v. new armored installation? Cost-benefits of new installation v. road realignment?
- Prompting for this reconstruction?
- How was proper culvert sizing for 100 yr. flow, wood, and sediment determined?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 923.4. Construction and Reconstruction for Logging Roads..., p. 44.
- § 923.5. Erosion Control for Logging Roads and Landings, p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.
- § 923.11. Logging Road Watercourse Crossing Design..., p. 77.
- § 923.13. Logging Road Watercourse Crossing Reconstruction, p. 80.
- § 923.16. Watercourse Crossing Maintenance and Monitoring, p. 86.



Site #7: JDSF Road 571 (Whiskey Springs Road). Rocked ford Class III crossing upgrades for recent “Camp 6” timber sale.

Discussion Points/Questions:

- Advantages and disadvantages of rocked ford crossings?
- Where are rocked ford crossings appropriate?
- How do you size a rocked ford crossing?
- Crossing construction techniques: what rock and where does it go? Installation during or after log hauling?
- What has monitoring of rocked ford crossing installations shown?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definition for term, “Ford,” “Road Approach,” pgs. 5, 7.
- § 923.10. Planning for Logging Road Watercourse Crossings, p. 75
- § 923.11. Logging Road Watercourse Crossing Design..., p. 77
- § 923.13. Logging Road Watercourse Crossing Reconstruction, p. 80.
- § 923.14. Logging Road Watercourse Crossing Erosion Control, p. 83.
- § 923.16. Watercourse Crossing Maintenance and Monitoring, p. 86.



Site #8: Road 571 (Whiskey Springs Road). New road construction (full bench) on steep slopes. Road segment constructed as part of “Camp 6” timber sale.

Discussion Points/Questions:

- Necessity, prompting, and planning for this new road construction-relationship to yarding method? Previous access to timber from where?
- How road construction techniques and equipment is necessary on steep slopes?
- Differences between full bench construction and cut and fill – where do full bench spoils end up, etc?
- Trade-offs between steeper mid-slope road location and increased distance from nearest perennial watercourse?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 923.1. Planning for Logging Roads and Landings, p. 26.
- § 923.2. Design and Location for Logging Roads..., p. 35.
- § 923.4. Construction and Reconstruction for Logging Roads..., p. 44.
- § 923.5. Erosion Control for Logging Roads and Landings, p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.



Site #9: JDSF Road 54 (Dunlap Camp). Abandoned or deactivated road and associated Class II watercourse crossing. 36 inch CMP removed in 2011.

Discussion Points/Questions:

- Is this an abandoned road and crossing or a deactivated road and crossing?
- Pros and Cons of straw mulch v. slash packing for erosion control?
- How is success of this project measured in terms of hydrologic reconnection?
- What is monitoring expectation for abandoned or deactivated roads/crossings?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions for “Abandoned Road,” “Abandonment,” “Deactivated Road,” “Deactivation” pgs. 3, 5.
- § 923.8. Abandonment and Deactivation of Logging Roads..., p. 69.
- § 923.14. Logging Road Watercourse Crossing Erosion Control, p. 83.
- § 923.16. Watercourse Crossing Maintenance and Monitoring, p. 86.
- § 923.17. Logging Road Watercourse Crossing Removal, p. 88.



**Site #10: JDSF Road 54 (Dunlap Camp).
Abandoned road and pulled Class III crossing.
Heavy slash packing at crossing removal site.**

Discussion Points/Questions:

- Is this crossing abandoned or deactivated?
- Use of heavy slash v. straw mulch for soil stabilization – methods and strategies?
- Does slash meet 75% minimum coverage standard?
- What prompted this management decision and what is expected to happen with this crossing over time?
- What is monitoring expectation for abandoned or deactivated roads/crossings?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions for “Abandoned Road,” “Abandonment,” “Deactivated Road,” “Deactivation” pgs. 3, 5.
- § 923.5. Erosion Control for Logging Roads and Landings, p. 51.
- § 923.8. Abandonment and Deactivation of Logging Roads..., p. 69.
- § 923.14. Logging Road Watercourse Crossing Erosion Control, p. 83.
- § 923.16. Watercourse Crossing Maintenance and Monitoring, p. 86.
- § 923.17. Logging Road Watercourse Crossing Removal, p. 88.



**Site #11: JDSF Road 200, Chamberlain Creek (above Conservation Camp).
Class I watercourse crossing with sediment movement on crossing
approaches and via inside ditch drain.**

Discussion Points/Questions:

- How would requirement for “hydrologic disconnection” be enforced at this location?
- Options and expectations for arresting sediment movement and improving hydrologic disconnection “to the extent feasible?”
- Are road surface and ditch drain sources of “significant sediment discharge?”
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions of “Permanent Road,” “Road Approach,” “Road Maintenance,” “Significant Sediment Discharge,” “Significant Existing or Potential Erosion Site,” pgs. 6-9.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.



Site #12: JDSF Road 200. Road within Class I WLPZ of Chamberlain Creek that serves year-round residences and youth camp. Sediment movement in long inside ditch drains (observe up to first cross drain culvert at this stop).

Discussion Points/Questions:

- How would requirement for “hydrologic disconnection” be enforced at this location?
- Options and expectations for arresting sediment movement and improving hydrologic disconnection “to the extent feasible?”
- Pros and Cons of moving road out of WLPZ – challenge of locating alternative route in light of other uses?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions of “Permanent Road,” “Road Maintenance,” “Significant Sediment Discharge,” “Significant Existing or Potential Erosion Site,” pgs. 6-9.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.



Site #13: JDSF Road 200. Undersized 36 in CMP with concrete headwall. Approximately 1,200 feet of inside ditch draining to crossing.

Discussion Points/Questions:

- How would proper culvert sizing for 100 yr. flow, wood, and sediment be determined?
- Options and expectations for cross drainage of inside ditches to achieve greater hydrologic disconnection?
- Implications of year-round access on operating surface stability – routine grading of inside ditches; limitations on road prism geometry.
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions of “Permanent Road,” “Road Maintenance,” “Significant Sediment Discharge,” “Significant Existing or Potential Erosion Site,” pgs. 6-9.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.
- § 923.11. Logging Road Watercourse Crossing Design..., p. 77.
- § 923.13. Logging Road Watercourse Crossing Reconstruction, p. 80.



Site #14: JDSF Road 200. Recently graded inside ditch – sediment delivery to watercourse crossing.

Discussion Points/Questions:

- How would requirement for “hydrologic disconnection” be enforced at this location?
- Options for hydrologic disconnection of roads when access is not solely controlled by timber owner?
- “Inside ditch hydraulic capacity”- Is ditch producing significant sediment discharge consistently or just when it is freshly graded – would vegetation remedy problem?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions of “Permanent Road,” “Road Maintenance,” “Significant Sediment Discharge,” pgs. 6-9.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.6. Use of Logging Roads..., p. 60.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.



Site #15: TCF-Two Log Creek Road. Rocked crossing approaches with “rolling hump” for disconnection of road drainage from crossing.

Discussion Points/Questions:

- How would requirement for “hydrologic disconnection” be enforced at this location?
- Pros and Cons of rocked approaches v. non-surfaced – differences in sediment generation?
- Implications of road rocking on necessity for road shaping (outsloping, crowning)?
- How does “rolling hump” contribute to disconnection?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definition for term, “Road Approach,” p. 7.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.
- § 923.10. Planning for Logging Road Watercourse Crossings, p. 75
- § 923.11. Logging Road Watercourse Crossing Design..., p. 77
- § 923.13. Logging Road Watercourse Crossing Reconstruction, p. 80.



Site #16: TCF. Two Log Creek Road. Vegetated inside ditch drains to a Class II watercourse without disconnection.

Discussion Points/Questions:

- How would requirement for “hydrologic disconnection” be enforced at this location?
- Is “Road Rules” proposal flexible enough to accommodate TCF “green grading” policy as mitigation measure?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions of “Permanent Road,” “Road Maintenance,” pgs. 6-7.
- § 923. Intent for Logging Roads..., p. 22.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.



Site #17: TCF. Mid-slope road with rolling dips installed 3-4 yrs ago.

Discussion Points/Questions:

- How would requirement for “hydrologic disconnection” be enforced at this location?
- Pros and Cons of rolling dips v. waterbars?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 895.1. Definitions of “Permanent Road,” “Road Maintenance,” pgs. 6-7.
- § 923. Intent for Logging Roads..., p. 22.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.



Site #18: TCF. Mainline road (“Rabbit Ears” location) located within Class I WLPZ for Big River. Discuss need for road relocation out of the WLPZ and need for BOF rule flexibility.

Discussion Points/Questions:

- How would requirement for “hydrologic disconnection” be enforced at this location?
- Options and expectations for arresting sediment movement and improving hydrologic disconnection “to the extent feasible?”
- Pros and Cons of moving road out of WLPZ – challenge of locating alternative route?
- PHI Questions or concerns?

Applicable Sections of “Road Rules, 2012” Proposal:

- § 923. Intent for Logging Roads..., p. 22.
- § 923.1. Planning for Logging Roads and Landings, p. 26.
- § 923.2. Design and Location for Logging Roads..., p. 35.
- § 923.5. Erosion Control for Logging Roads..., p. 51.
- § 923.7. Maintenance and Monitoring of Logging Roads..., p. 63.

EXCERPTS OF KEY ISSUES/QUESTIONS IDENTIFIED DURING FPC MEETINGS

1. Issue Number 3 – Minimum road distance from watercourses and WLPZ.

“The rule package specifies that new roads need to be no closer than 100 ft. from a WLPZ boundary. Weaver and Hagans recommend for a slope of 50%, a distance of 250 ft between the road and a watercourse. Assuming a Class I buffer of 100 ft. in this case, the Weaver and Hagans recommendation would be 150 ft from the road to the WLPZ boundary not 100 ft.”

2. Issue Number 5 – Roads on Slopes Greater than 65%.

“The rule package suggests that roads on slopes greater than 65% would be allowed. Both Meehan and Weaver and Hagans recommend not locating roads on slopes above 50-55%. If it is necessary to locate roads on slopes above 60% then full bench construction with no side cast is the recommended approach.”

3. Issue Number 11 – Unstable Areas, wet weather operations, and erosion.

“During the listing process for these species, NMFS reviewed the FPR and in all cases concluded they do not adequately protect anadromous salmonids or provide for properly functioning habitat conditions (61 FR 56141; 61 FR 56140; 62 FR 24593; 63 FR 13347; 65 FR 6960; 65 FR 36074). In fact, these Federal Register Notices conclude that California’s non-Federal forestry practices are significant factors contributing to salmon and steelhead population declines: declines resulting from the degradation, simplification and fragmentation of habitats through the present or threatened destruction, modification, or curtailment of habitat and range, and the inadequacy of existing regulatory mechanisms.

4. All other winter operations and wet weather road and skid trail planning.
5. Road planning, construction, maintenance, and decommissioning.
6. Loss of riparian function and chronic sediment inputs from streamside roads.
7. Unstable areas except for inner gorges.”

11(A) Land forms and unstable areas.

“The T/I Rules seem to be overly focused on using riparian zones as a primary means for buffering aquatic habitat for anadromous salmonids from effects of timber operations. While we agree that such zones can be very effective in many instances, we are concerned that there is not adequate recognition of landforms and processes that are inherently sources of significant sediment pulses (e.g. debris flows) that can overwhelm watercourse and lake buffering capability and produce valley-bottom deposits that continue to leak into the stream for many decades. We recommend the T/I Rules be amended to address these deficiencies. We also recommend that a thorough review of the scientific literature be performed to better understand how to manage forest land where these landforms and processes are present.”

11(B) “Avoid” or “Minimize” on unstable areas

“Clarify whether a condition is to be avoided or minimized. For example on page 39, (5) the plead states that activities in unstable areas and headwall swales should be minimized. On page 40 the plead states that roads and landings shall avoid unstable areas and headwall swales.”

11(C) Consideration of unstable areas during erosion site assessment.

“(923.1 (d) (3)(E) pg 31 ver 3/28/11) Add consideration of mass wasting potential in unstable areas as a criterion for measures to address erosion site treatments.”

4. Issue Number 12 – Road Density.

“Plead states that roads shall be located in order to reduce total road mileage. Is this a road density requirement?”

“The road rules package should address road density. I had put together some comments on this issue last summer (see below) and would like to make sure the issues is fully addressed as part of the road rules package.”

Hagans et al. (1986) estimated that 50 to 80% of the sediment that enters northwestern California streams stems from road-related erosion. Klein (2003) found a strong correlation of road density with turbidity levels that would limit juvenile salmonid growth (Figure 19).

U.S. Forest Service (1996) studies in the interior Columbia River basin found that bull trout were not found in basins with road densities greater than 1.7 mi/mi². They ranked risk road density of greater than 4.7 mi/mi² as extremely high. National Marine Fisheries Service (1996) guidelines for salmon habitat characterize watersheds with road densities greater than 3 mi/mi² as “not properly functioning” while “properly functioning condition” was defined as less than or equal to 2 mi/mi² with no or few stream side roads.”

5. Issue Numbers 14 & 18 – Removal of obsolete culverts. Crossing design.

“Criteria for removal of obsolete culverts need to be developed. Design criteria and method of analysis needs to be defined for new or replacement culverts including fish passage considerations.”

As a side note, as commonly practiced, reviewing agencies cite these rules and require culvert removal. Cal DFG then requires a 1611 permit fee from the landowner for a project that has been required by the state. This appears to be extortive. CALFIRE, as the lead agency should remedy this situation.”

Comment 18F Crossing design

“What is the criteria used to bring existing culverts up to standard i.e. 100 year flow, fish passage, etc? What is the criteria for culvert replacement and analysis method to determine the design of the new culvert, including fish passage considerations?”

Comment 18G Crossing/culvert size

“The Road Rules Task Force does not recommend a minimum culvert size while the SRP recommends that the minimum culvert size is 18 inches for crossings and 12 inches for ditch relief culverts.”

6. Issue Number 19 – Maintenance Period

“Issue: The three year limitation on maintenance of permanent roads and crossings.

I compared the latest version of the proposed road rules against the recommendations of experts on the subject. Attached is an analysis of the proposed rule package verses the recommendations of the Scientific Review Panel, Legon et al, 1999 and the Weaver and Hagens "Manual for Forest and Ranch Roads". The preliminary conclusion that I reached as a result of this analysis was that although the proposed rule package has a number of improvements, there are still some areas that need strengthening. These are:

The SRP report identifies the three year limitation of the maintenance period as a major issue. The SRP states that all permanent roads and crossings should be maintained through out their useful life.”