

ATTACHMENT C

Riparian haul road reconstruction impacts: post-mining road treatment, Gualala River, Wheatfield Fork above Annapolis Road bridge, Valley Crossing (Oct. 5, 2006)

Fig. C-1 – Reference condition samples



C-1-a



C-1-b

Fig. C-1 (a, b, above). Reference condition samples, riparian floodplain. Some reference conditions in riparian floodplain zone unaffected by road expansion. Views represent only a small sample of the variable vegetation, but indicate the maturity and density of cover at all layers. (a) willow-alder woodland (overstory) with nettle, blackberry, thimbleberry, horsetail, species dominant in ground layer and shrub layer. Channel is bright background. (b) swordfern, sedges, occur under dense mixed canopy of bigleaf maple, willow, alder, and redwood, with well-developed litter layer and coarse woody debris. Channel is bright background.

Fig. C-2. New drainage of road and floodplain to river; unconsolidated fine sediment source



C-2-a



C-2-b



C-2-c

Fig. C-2. New drainage of road and floodplain to river; unconsolidated fine sediment source. New drainage trenches/ditches cross road and seasonal wetlands of forested floodplain. (a, b) Two views of unarmored drain across graded road adjacent to channel bank. Road surface is re-graded flood-deposited silt mixed with coarser underlying road bed material. Drain forms chute for eroded, suspended unconsolidated silts to flow into channel and pools below during runoff or high-energy flood events. Straw mulch at edge of road does not affect erosion of silt from extensively graded road. (c) natural silt levee (note laminar internal bedding) in floodplain is breached to depth of over 1 meter, draining road and adjacent floodplain to channel. This trench is likely to dewater portions of the floodplain that would naturally form seasonal wetlands, as indicated by dominant stands of California blackberry, willow, horsetail, fern stands.

Fig. C-3. Road widening beyond original one-lane footprint; spoil placement, soil destabilization, major riparian vegetation removal



C-3-a



C-3-b



C-3-c



C-3-d



C-3-e



C-3-f



C-3-g

Figure C-3. Road widening beyond original one-lane footprint into floodplain or edge of bank above channel; spoil placement, soil destabilization, major riparian vegetation removal. 3a-d. Road graded beyond original edge to form wide shoulder of unconsolidated flood-deposited sediment placed up to and over edge of road cut above channel pool with resident fish (species undetermined) and yellow-legged frogs (adults and juveniles; garter snakes intermittent). Straw mulch is placed within flood zone submerged at peak flows. Alder-willow woodland was “brushed” away; note bent and broken young trees in 3c. 3e-g. Unstable, unconsolidated graded fill placed at edge of road cut on extremely steep, high slope above large, deep meander bend channel segment with resident steelhead.

Fig. C-4. Sediment/debris spoil disposal piles and turn-out/bypass lanes beyond original one-lane road, encroaching forested floodplain or terrace, riparian canopy gap impacts.



C-4-a



C-4-b



C-4-c



C-4-d

Figure C-4. Sediment/debris spoil disposal piles and turn-out/bypass lanes beyond original one-lane road, encroaching forested floodplain or terrace, riparian canopy gap impacts. 4a-b: loose graded sediment and debris pile placed over devegetated channel bank edge; willow riparian and alder-maple woodland riparian canopy removed; possible redwood removal beyond road edge (see right, b). 4c: construction of new turnout/bypass lane (double road segment), including removal of redwoods beyond road edge (note multiple fresh cuts). 4d: graded area larger than road width with loose sediment and debris; large canopy gap in redwood forest.



Figure C-5. Example of “brushing” consisting of tree removal (and canopy gap) upslope beyond road edge.