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Cover Photo: The water intake on Lake Creek, supplying Oregon Caves National Monument, is here inspected by Bill Weaver (left), Oregon Caves Supt. John Miele (center), and Danny Hagans. See story page 00.

Failed Logging Road Interrupts Water Supply

A massive mudslide – up to 1,000 cubic yards of debris – starting from a logging road constructed by the U.S. Forest Service, in December 1981 plunged down an unstable slope above the Lake Creek intake for Oregon Caves National Monument's water supply, causing two episodes of excessive turbidity.

Redwood National Park came to the aid of Oregon Caves NM Supt. John Miele in the summer of 1982, sending Danny Hagans, geologist, and Bill Weaver, engineering geologist, to make a field inspection. The USFS subsequently implemented two of the nine NPS recommendations for corrective actions.

On May 23, 1983, a second high turbidity episode occurred, and on June 8, Weaver and Hagans again were loaned to the Monument to try to determine the cause. The photos and captions shown here describe the state of the slope and the water supply as of June 1983. The 1983 landslide and mudflow was caused, or strongly influenced, according to Hagans and Weaver, by diverted streamflow along the 4045D logging road.

A September 1983 memo from Redwood Asst. Supt. Donald M. Spalding to Supt. Miele, in part describes the mechanics of the problem:

"The accumulation of 1981 landslide debris on the 4045D road currently diverts streamflow to the north along the road for about 50 feet, where it enters 6-inch to 1-foot high scarps along the fill portion of the road prism. The new landslide is approximately 100 feet downslope from the scarps. Slopes within this area are extremely wet and naturally characterized by abundant Willow vegetation. Soils exposed in the crown and lateral landslide scarps are 10 to 15 feet deep and consist of primarily coarse sand derived from decomposed granitic bedrock. The addition of water to an already wet slope underlain by relatively cohesiveless materials apparently elevated pore pressures in the slope and led to the landslide and mudflow. This condition coupled with the existing lack of lateral hillslope support along the 1981 debris torrent track will continue to pose a high risk of future landsliding and, presumably, high turbidity in Lake Creek."

Supt. Miele reported to the Pacific Northwest Region on Oct. 13, 1983, that he and Resource Asst. Don McClennan of the USFS had conducted an Oct. 12 inspection of the site . . . that McClennan recognized the need to correct the stream diversion at the 4045D road crossing, and that this would be accomplished "prior to the onset of winter." McClennan agreed that catch basin structures Nos. 2 and 3 would be strengthened, but indicated that the stored sediments would not be cleaned out.

If excessive turbidity recurs this winter, Miele said, "we should reevaluate the situation and, if necessary, consider building a new permanent water intake upstream."



The lowest sediment storage structure installed by Forest Service personnel was this check dam made of chain-link fence and a filter fabric. The dam, (#1) built next to a large windfall log, collected and stored sediment through much of the 1982-83 winter after which the channel changed course (braided), leading to a lowering of the baseland. Approximately one half to one third of the stored sediment was eroded and transported downslope.



The next higher dam, (#2), built by the Forest Service, functioned well until May 1983 when a rotational slide occurred, resulting in a mudflow down the channel and causing failure of check dams Nos. 2 and 3 (see next photo). The No. 2 dam currently has no available future storage, so it will only route sediment through or over the dam. Dam No. 2 has the potential of failing in the same manner as Dam No. 1 and transporting stored sediment toward Lake Creek.

The view downstream with Check Dam No. 3 in the foreground and No. 2 in the distance. Dam No. 3 also has failed as a result of the landslide and mudflow above. The same potentials for failure exist here as exist at Check Dam #2.



Landslide slump block and crown scarps on a very wet slope, which resulted in the mudflow of May 1983 that caused high turbidity values in Lake Creek and probably breached Check Dams 2 and 3. Cause of the slide was diverted streamflow along the 4045D road. USFS personnel have subsequently inspected the site and recognized the need to correct the drainage problem.



Looking downslope at Check Dam #4 on USFS 4045D road with wet slope and May 1983 slide in the distance. Dam #4 stored no sediment and basically no material was transported out of the upslope scar from the December 1981 slide. Streamflow out of the old slide scar is diverted by road to the right in the photo, only to cross the road and travel downslope, causing increased soil saturation in the vicinity of the new slide.

