Extreme Erosion Control at McWay Landslide

Winter Report - May, 1998

Prepared for CalTrans Environmental Planning San Luis Obispo

Erosion Control

No Erosion Control

Moss Landing Marine Laboratories
The Watershed Institute
Rana Creek Ranch

• McWay landslide is the most severely eroding feature along the Big Sur section of coastal Highway One.

• Rates of erosion are extremely high and accelerating.

• Highway One will be undercut and closed again if the slide continues to erode without control efforts.

• Erosion control with native plants is the most economically and ecologically sound option for protecting the Highway.

• It may also be necessary to construct a retaining structure along the vertical cliffs bordering the south edge of the new highway bridge.

• Bare soil along the highway attracts non-native weeds that are not good for erosion control.

• Environmental impacts to the Marine Sanctuary can be minimized by covering bare ground with native plant communities.

• Other ecosystem services of native plant communities include greater water retention of the soils by the biological sponge, increases in native habitat and biodiversity, and weed control.

• Establishment of native plant communities requires about a five year commitment to maintenance at greatly reduced costs after the first year.

• The most important maintenance must occur after each winter erosion event particularly to prevent gully formation.

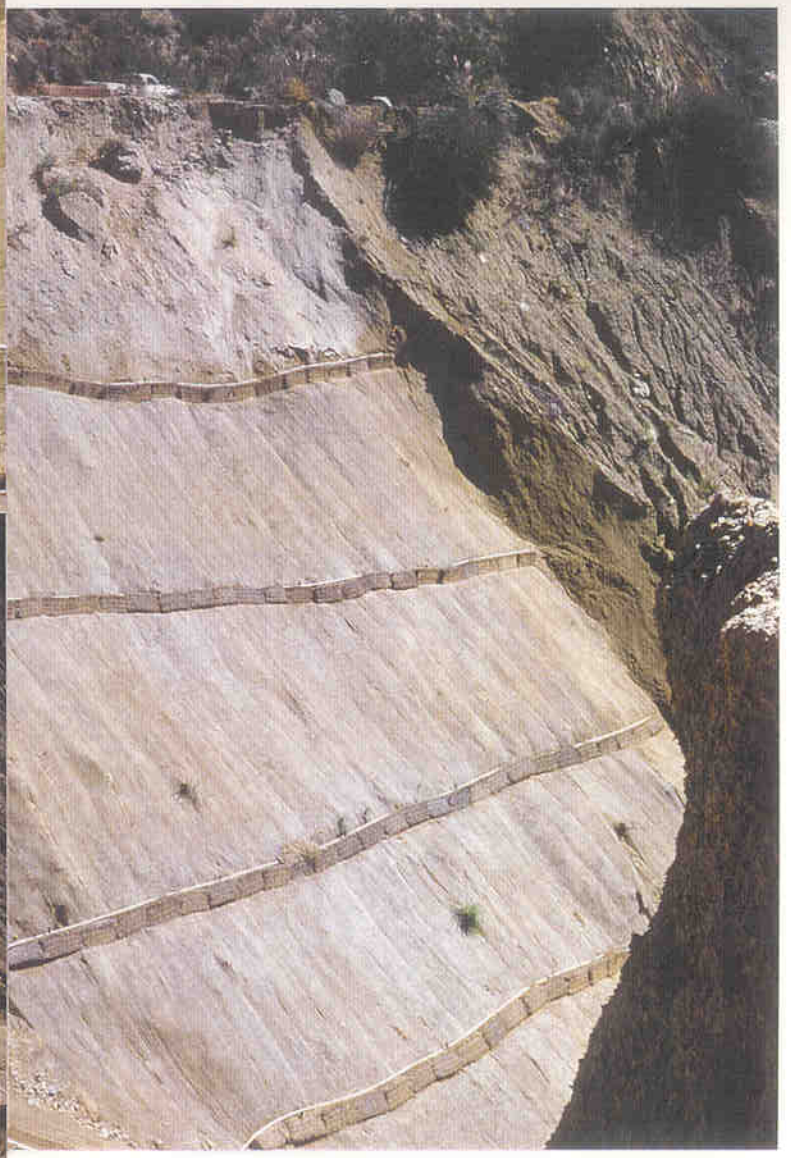
• Nutrients should be added with native seeds and as maintenance requires, and irrigation should be done in the first year if needed.

• Caltrans is presently covering bare ground with native plants along the Big Sur section of Highway One after the extreme rains this year. These sites can be maintained at a small fraction of the first year costs and are outstanding examples of how to treat bare ground along all state and county roads as well as most farm roads throughout the state, nation, and world.

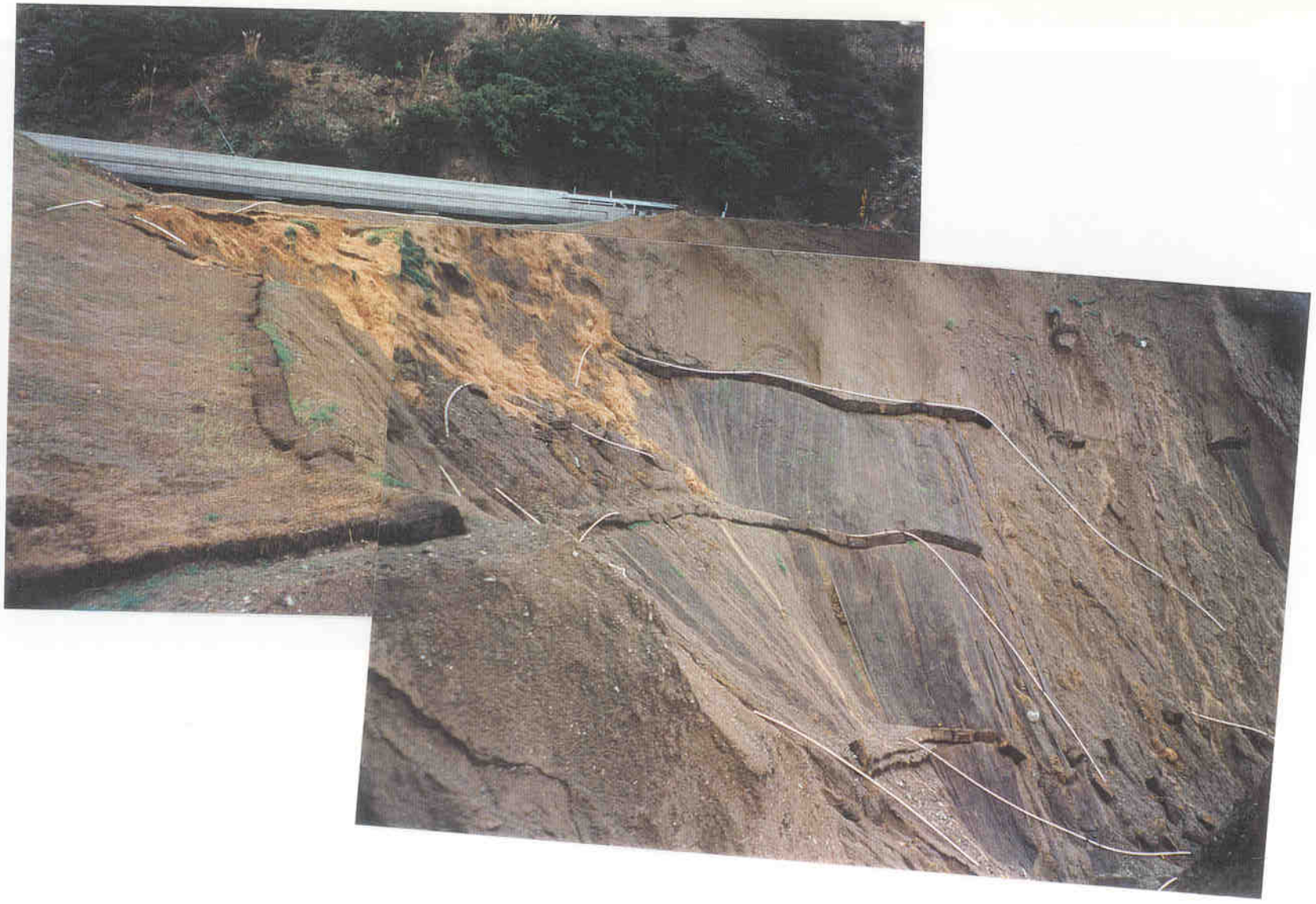
McWay landslide on May 18, 1984
Caltrans depositional event completed
Erosion of gully beginning from incorrect drainage

McWay landslide on November 21, 1997
Jute and haybale rows with irrigation pipes
Hay, seed, no nutrients except green patches near the bridge

McWay Landslide in October 1997
Seed, Hay, Jute, Haybales and Irrigation
(no nutrients)

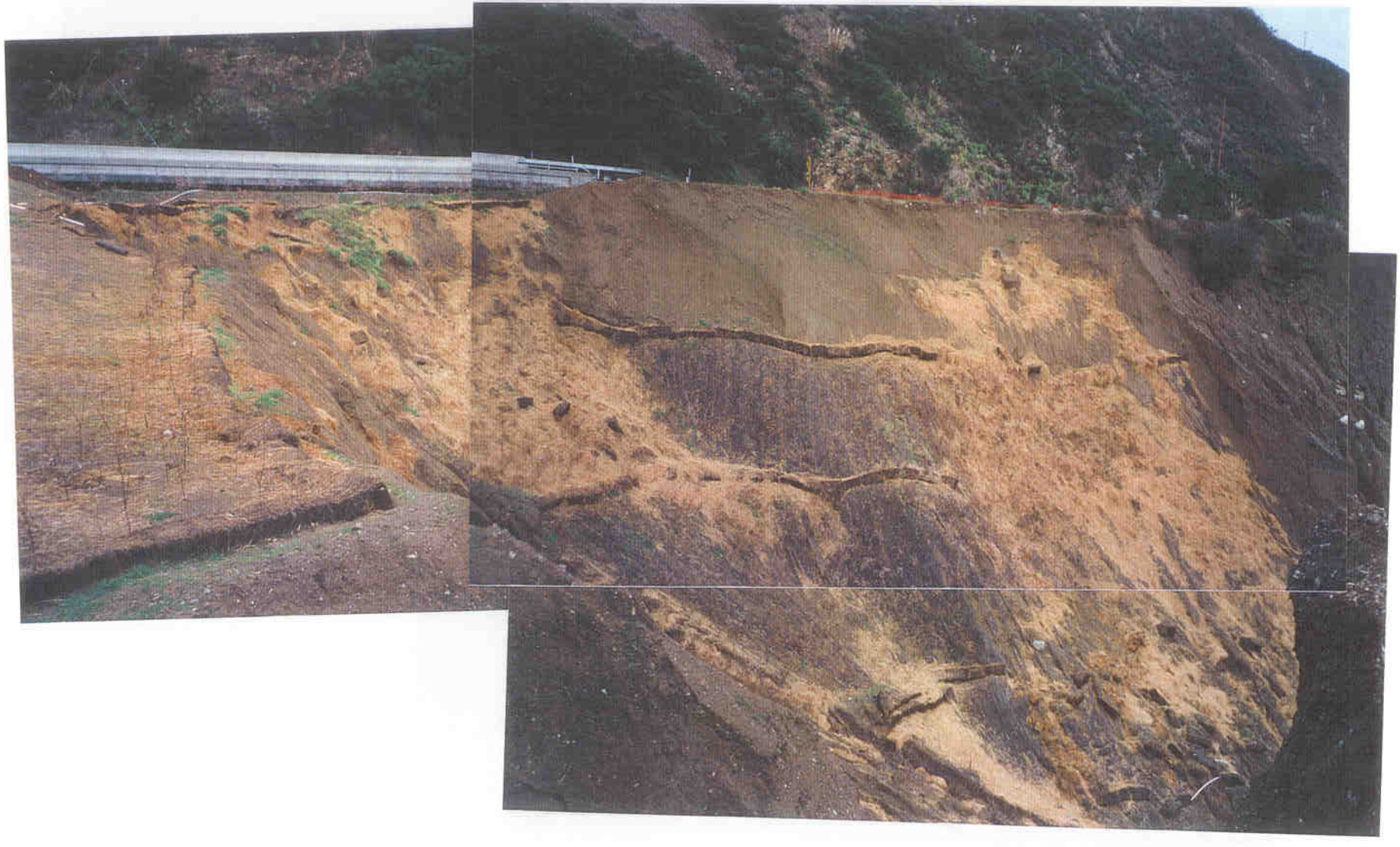


McWay landslide on December 9, 1997 after two major rains (1 and 2 inches),
jute slumped from southern portion, surviving irrigation,
first hay, seed, and nutrient treatment just beginning in the bowl.



McWay landslide on December 18, 1997 after two major rains (1 and 2 inches), hay, seed, and nutrients are spread over the bowl.

McWay landslide on January 4, 1998 after some rain damage,
willow cuttings plugged 3-4 feet apart
hay, seed, and nutrients spread over exposed soil.



McWay landslide on January 4, 1998 after some rain damage,
willow cuttings plugged 3-4 feet apart
hay, seed, and nutrients spread over exposed soil.

McWay landslide on April 23 (top) and May 8, 1998 (bottom) showing the growth of native plants around the upper rim of the bowl, where erosion control was centered. Soil erosion into the ocean was dramatically reduced and there was no highway damage.

McWay landslide on May 8, 1998 looking up the bowl from the beach showing the establishment of native plants in the upper region and the deposition of over 95% of the winter eroded soil within the central bowl, not into the ocean (top). The bottom picture is a closer view of developing grasses and hay.

McWay landslide on November 25, 1997 (left) with jute covering the center of the erosion control area; and on April 17, 1998 (right) showing extreme erosion on the face of the landslide where there was no erosion control.

McWay landslide on May 8, 1998 showing extreme erosion on the face of the landslide where there was no erosion control and even significant erosion since the picture taken on 18 March.

McWay landslide on May 8, 1998 showing the movement of soil eroded from the slide face into the Marine Sanctuary.