

**Watershed Analysis
for Mendocino Redwood Company's Ownership
in the
Albion River Watershed**

INTRODUCTION

This report presents the results of an intensive watershed analysis performed by Mendocino Redwood Company, LLC (MRC) on their ownership in the Albion River watershed. The MRC ownership in the Albion River watershed is considered the Albion watershed analysis unit (WAU). This section presents an overview of the watershed and the watershed analysis process followed by MRC. More specific information is found in the individual modules of this report.

The majority of the information for this watershed analysis was collected and presented in 1998. This version presented in 2004 represents an update to the watershed analysis. The update was performed primarily to update information in the mass wasting section. However, new information for the surface and point source erosion, riparian, stream channel condition, and fish habitat sections was added as well.

Mendocino Redwood Company's Approach to Watershed Analysis

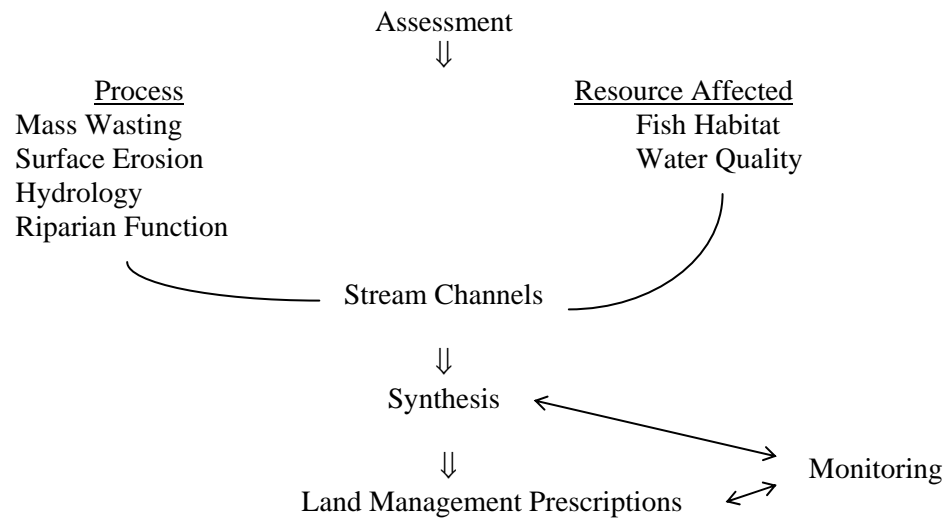
MRC is conducting intensive watershed analysis on key watersheds within its ownership in Northern California. The criteria for a watershed to be selected for intensive analysis are: 1) impaired waterbodies pursuant to the Clean Water Act Section 303(d), and 2) forestry operation-related concerns and key fish populations.

The Albion River is on the 303(d) list as sediment impaired and a total maximum daily load (TMDL) must be developed for sediment reduction in the river by the end of 2001. The Albion River and its tributaries support populations of coho salmon and steelhead trout, two fisheries of concern in northern California. For this reason MRC conducted an intensive watershed analysis to assist in their efforts to reduce non-point source pollution, evaluate current and past land management practices and establish a baseline for monitoring of watershed conditions over time. The intensive watershed analysis will also be used to identify needs for site-specific management planning in the watershed to reduce impacts to aquatic resources and potentially to improve fish and stream habitat conditions.

The intensive watershed analysis of the Albion River WAU was conducted following the guidelines in the Standard Methodology for Conducting Watershed Analysis (Version 3.0, Washington Forest Practices Board). Some variations of the methods in this manual were performed when it was determined that the methodology better served the purpose of this assessment. The watershed analysis process is not a regulatory requirement in the state of California. However, MRC is using this process to address cumulative effects from forest practices and provide baseline information of watershed conditions for aquatic habitat and water quality for their ownership.

MRC's approach to the Albion River intensive watershed analysis was to perform resource assessments of mass wasting, surface erosion, hydrology, fish habitat, riparian condition and stream channel condition (Figure 1). The hillslope hazards are addressed by mass wasting, riparian condition and surface erosion modules. The physical processes and potential triggering mechanisms for each hillslope hazard are described in the module reports. The vulnerability of aquatic resources are addressed by the fish habitat and stream channel condition modules. The results of the resource assessments are synthesized and reported in a causal mechanism report. A causal mechanism report is produced for each hillslope hazard that has affected or has the potential to adversely affect aquatic resources. The causal mechanism report contains a description of the hillslope hazard and how land use activities trigger or route key input variables such as coarse sediment, fine sediment, wood and heat energy to sensitive resources. A prescription is developed to address the issues and processes identified in each causal mechanism report. Finally, monitoring is suggested to determine the efficacy of the prescriptions to protect sensitive aquatic resources. The monitoring will provide the feedback for MRC's adaptive management approach to resource conservation (Figure 1).

Figure 1. Watershed Analysis Overview



Assessment Overview

This watershed analysis was produced from a combination of field observations, performed during the summer of 1998, aerial photograph interpretation, and use of existing analysis on the Albion WAU. Some mass wasting observations for this update were taken in 2003, with additional aerial photograph interpretation from 2000 photos.

Existing data or analysis used in this watershed analysis included: Louisiana-Pacific's (L-P) Coastal Mendocino Sustained Yield Plan, The Albion River Watershed Assessment by L-P, Soil Survey information, and monitoring data collected by L-P. These information sources are cited in each module as they are used.

Aerial photograph interpretation was performed using available aerial photographs for the recent time period. The delineation of time periods for analysis was based on the available aerial photographs. The aerial photographs used are described below.

<u>Aerial Photo Year</u>	<u>Scale</u>	<u>Photo Source</u>
1987	1:15,840	Mendocino Redwood Co.
1996	1:12,000	Mendocino Redwood Co.
2000	1:13000	Mendocino Redwood Co.

The synthesis of the field observations, aerial photo interpretation and existing analysis on the WAU constitutes the resource assessment modules in this report.

Albion River Watershed Analysis Unit Overview

Physical Characteristics

General Location

The Albion WAU is a coastal watershed that drains into the Pacific Ocean and is located in western Mendocino county, California. The outlet is approximately 16 miles south of Fort Bragg, adjacent to the town of Albion.

The Albion River watershed encompasses approximately a 43 mi² area. The Albion River watershed is broken up into 4 different planning watersheds as delineated by the California Water Agency. MRC owns approximately 54 percent of the land in the Albion River watershed (see Base Map, Albion River Watershed Map and Table 1). The basin's elevations range from sea level to 1566 feet. Rainfall is seasonal in this region, with most of the rain (approximately 44-58 inches/year) occurring between October and May.

Table 1. Selected Physical Characteristics by Planning Watershed for the Albion River WAU (from L-P's Coastal Mendocino SYP, 1997).

Characteristics	Upper Albion River 11340010	Middle Albion River 11340011	South Fork Albion River 11340012	Lower Albion River 11340013
Watershed Area (ac)	8736	4876	5830	8070
MRC Owned Area (ac)	1862	3738	4696	4510
MRC Owned Area (%)	21%	77%	81%	56%
Mean Annual Precipitation	58	55	54	44

Fisheries

Coho salmon (*Oncorhynchus kisutch*) are currently known to reside in the Albion WAU. Other fish species known to reside in the WAU are steelhead (*Oncorhynchus mykiss*), sculpin (*Cotus sp.*), stickleback (*Gasterosteus aculeatus*), and Pacific lamprey (*Lamptera tridentata*). See Section F - Fish Habitat Assessment for distribution.

Geology

The Albion WAU is characterized by the Coastal Belt of the Franciscan Complex, except the eastern headwaters of the Upper Albion River Planning Watershed which is underlain by Mesozoic volcanics. The flat topography of marine terraces on the coast of the Pacific Ocean, and intervening inner gorges of the main streams are the major geological features (L-P, 1997).

Rocks of the Coastal Belt are highly sheared, and comprise structurally deformed massive, hard greywacke sandstone and shale interbedded with small amounts of limestone and pebble conglomerate. Strata are homoclinally folded, strike to the northwest, and dip moderately to steeply to the northeast except where they are disrupted near fault zones. Near the coast, the streams of the Albion WAU flow perpendicular to the ocean within relatively narrow inner gorges, dissecting the flat Pleistocene coastal terraces. Inner slopes of these gorges exhibit instability in the form of debris slides, deep-seated rotational slides, and rockfalls (L-P, 1997).

The floor of the Albion River downstream from the confluence with South Fork Albion River is covered with Holocene alluvium deposits. North Fork Albion River upstream from the Portuguese Gulch, and Albion River upstream from the confluence with North Fork Albion River flow through the Holocene-Pleistocene river terraces.

Soils in the marine terrace areas near the ocean are of the inceptisol soil order. Soils in the Coastal belt hard rocks and inner gorge areas are of the inceptisol soil order. The soils of the river terraces adjacent to the Albion River from about Duck Pond Gulch down river to the ocean are classified as hydric soils, due to saturated and semi-saturated conditions for a portion of each year.

LITERATURE CITED

Louisiana-Pacific Corporation. 1997. Sustained Yield Plan for Coastal Mendocino.

Washington Forest Practice Board. 1995. Standard methodology for conducting watershed analysis. Version 3.0. WA-DNR Seattle, WA.

