

Project Background

Pacific Watershed Associates (PWA) partnered with the Napa County Resource Conservation District (NCRCD) and Natural Resources Conservation Service (NRCS) to restore nearly 1,200 ft of intermittent stream channel on the Saintsbury Vineyards property in the Carneros Creek watershed, Napa County, California.

The project site is located along a tributary to Scotts Creek, approximately 0.5 mi upstream from the confluence with mainstem Carneros Creek. The area was originally disturbed in the 1940s with the construction of a road network, including the construction of 3 stream crossings. The project site was further altered in the mid-1990s with the construction of 3 earthen dams along the stream channel to create livestock ponds.

PWA conducted an assessment of road related erosion on selected parcels in the Carneros Creek and Sulphur Creek watersheds in 2002 and 2003. During the assessment, the 3 culverted stream crossings and 3 earthen dams at the Saintsbury project site were found to be partially eroded. Field assessment data revealed that this site represented the largest anthropogenic source of sediment observed in the Carneros Creek watershed.

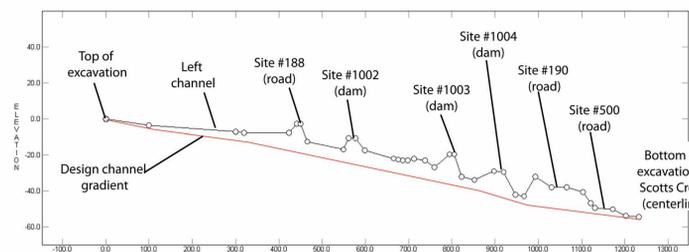
Funding through Scannell Properties #91 LLC and a State Water Resources Control Board 319h grant was secured by the NCRCD to treat erosion sites in the Carneros Creek watershed, including the Saintsbury project site. PWA was subcontracted by the NCRCD to develop the erosion control treatment plan, layout the specific treatments in the field, and supervise the implementation of the project. Erosion control and erosion prevention treatments were implemented in the summer of 2009.

PWA estimates that implementing this project resulted in the prevention of nearly 5,500 yd³ of sediment from delivering to Carneros Creek and its tributaries.

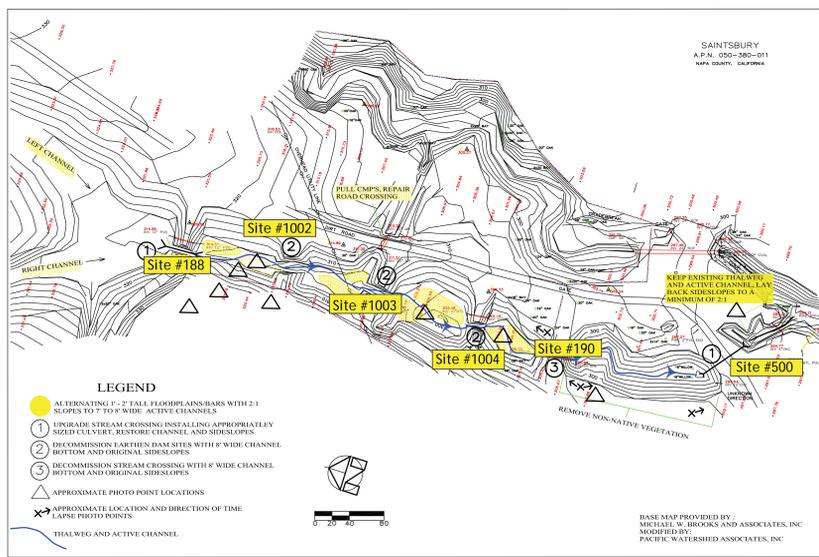
Phase I : Pre-implementation planning and site mapping

PWA conducted a field assessment of the project area in order to develop and design erosion control and erosion prevention treatments for the project. Field assessment included a detailed site mapping and a pre-excitation field survey (including profile and cross sections) to estimate potential sediment savings, excavation volumes and to document conditions prior to implementation.

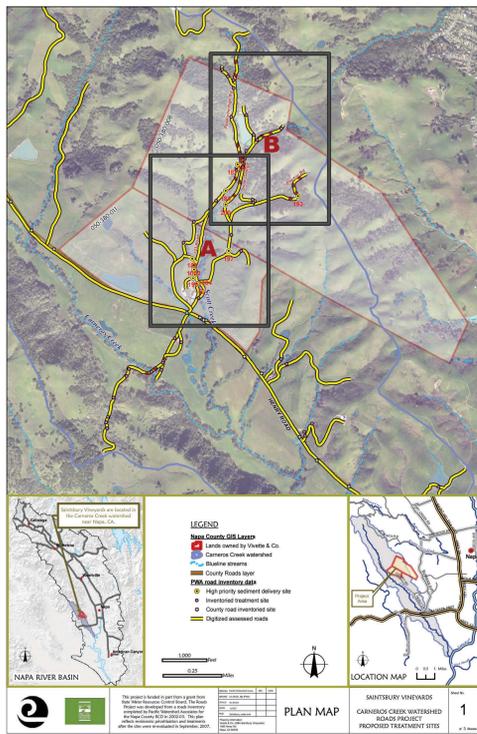
Long profile from top to bottom of excavation



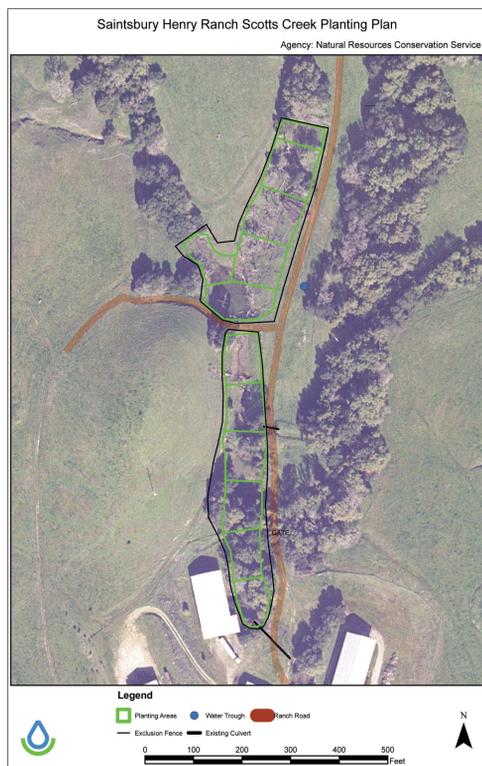
Project planning base map



Project Location



Revegetation planning



The NRCS developed the "Saintsbury Scotts Creek Revegetation Plan" to address the removal of nonnative vegetation and the establishment of native riparian vegetation.

Phase II : Project implementation

The project was implemented over a 13-day period during the summer of 2009. Charles Hope Construction conducted the heavy equipment and labor work using an excavator, dozer, backhoe, compactor, water truck, and dump truck.

Treatment implementation involved the following sequential steps:

- * Mechanically remove nonnative vegetation
- * Excavate fill from all stream crossings and earthen dams
- * Determine natural stream channel course, including sinuosity and channel grade
- * Reconstruct stream floodplains
- * Recontour stream valley side slopes to match the adjacent hillslopes
- * Upgrade 2 culverted stream crossings (Sites #188 and #500)
- * Install cattle exclusionary fencing
- * Straw mulch disturbed soils and replant side slopes with riparian vegetation

PWA supervised the implementation of the treatment plan and documented the process using time-lapse photography (see time-lapse video).

PWA conducted post excavation surveys (long profiles and cross sections) to monitor future channel changes and to evaluate the long-term success of the project.



Before and after photos of project implementation

Site #188: Replace stream crossing culvert

BEFORE **AFTER** 48" culvert

A partially washed out stream crossing with a plugged and undersized 12" culvert. The culvert was removed and replaced with a 48" culvert sized for the 100 year peak flow.

Sediment savings 170 yd³.

Site #190: Decommission stream crossing

BEFORE **AFTER**

A stream crossing with a partially crushed 24" culvert. Subsurface flow has caused a sinkhole in the road bed. The crossing was decommissioned by removing the culvert and restoring the stream channel.

Sediment savings 210 yd³.

Site #500: Replace stream crossing culvert

BEFORE **AFTER** 48" culvert with barrel extension

A buried and undersized 18" culvert at a partially washed out stream crossing. The culvert was removed and replaced with a 48" culvert sized for the 100 year peak flow.

Sediment savings 290 yd³.

Site #1002, #1003, and #1004: Decommission 3 earthen dams

BEFORE **AFTER** Exclusionary fencing

Site #1003

BEFORE **AFTER**

Site #1004

BEFORE **AFTER** Floodplain 8'-wide channel

Three partially washed out earthen dams used for livestock ponds. The dams were decommissioned and the stream channel, floodplain, and side slopes were reestablished.

Total sediment savings 4,800 yd³.

Riparian revegetation treatments



Straw mulching disturbed ground



Harvest Middle School children and other local volunteers planting trees along channel side slopes

Disturbed soils within the project area were revegetated with native grasses, shrubs, and trees as per the NRCS "Saintsbury Scotts Creek Revegetation Plan."

The NCRCD supervised and coordinated the implementation of revegetation treatments. Local volunteers, including 300 children from the Harvest Middle School, and 60 adults, planted 1,500 native plants!

Scope of Work

- 1) Remove fill from 3 eroded earthen dams (Sites #1002, #1003, and #1004)
- 2) Decommission a culverted stream crossing (Site #190)
- 3) Upgrade 2 culverted stream crossings (Sites #188 and #500)
- 4) Reestablish stream channel sinuosity and the floodplain
- 5) Recontour stream channel side slopes to match adjacent natural hillslopes
- 6) Install cattle exclusionary fencing
- 7) Revegetate project area with native riparian vegetation

Special thanks to the Natural Resource Conservation Service; Scannell Properties #91 LLC, SWRCB; Harvest Middle School, Napa; David Graves; Richard Ward; and Mary Pettis-Sarley