



# Creek Bank Protected With Cost-Effective High Performance TRM



California's rainy season begins in mid-October. The owner of this development wanted to protect the banks of Marshall Creek before the heavy rains began.

The standard design for bank protection is rock riprap up the entire slope and buried at the toe for scour. The design for this project was rock riprap buried at the toe to a depth of 5 feet below the ground surface and 3 feet up the bank. Pyramat® High Performance Turf Reinforcement Mat was placed the remainder of the way up the bank to the top of slope and was vegetated with native seed. The bank protection was designed for a 100-year storm event of approximately 2,900 cubic feet per second of flow and 10 feet per second of velocity.



## PROJECT FILE

<b>Project</b>	Three Rings Ranch
<b>Location</b>	Beaumont, CA
<b>Product</b>	Landlok® TRM 450 and Pyramat® HPTRM
<b>Application</b>	Bank protection
<b>Owner</b>	Brookfield Land Company, Inc.
<b>Contractor</b>	Stauffer's Landscape, Inc.
<b>Engineer</b>	Hall & Forman, Inc.
<b>Date</b>	October 2003 - November 2003



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Landlok® TRM 450 Turf Reinforcement Mat was placed in a side tributary channel to Marshall Creek. This tributary conveyed water from a storm drain pipe from the Three Rings Ranch development. This tributary was designed as a bioswale Post Construction BMP; the Landlok TRM 450 was used to protect the bioswale from erosion in large storm events.

This project is an overwhelming success. The combination of Pyramat HPTRM and rock riprap provides the scour and erosion resistant benefits of hard armor with the aesthetic and water quality benefits of vegetation. Brookfield Land Development, Inc., is especially happy with the cost savings of using the Pyramat HPTRM on the slope and the added aesthetic value to their development with the incorporation of native vegetation. By using the Pyramat HPTRM in lieu of the rock riprap on the slope they saved over \$150,000. Because of these benefits, this combination design of using soft and hard armor will become the standard for bank protection projects throughout California.