

RATTLESNAKE CREEK CED RETROFIT

JUNE 11, 2007

INTRODUCTION

The Rattlesnake CED site is located just below the confluence with the Naches River, on SR 410 adjacent to mile post (MP) 107.5. This site is approximately 13 miles northwest of Naches. SR 410, Chinook Scenic Byway is a seasonal highway open to mostly tourist traffic visiting Mt. Rainier and a main east/west connection in the summer months.

THE CED/MAINTENANCE PROBLEM

The CED site starts on the left bank of the Naches River directly across from the confluence with the Rattlesnake Creek and continues 1500 feet down the left bank Figure 1. The Naches River has undermined the road prism in this area resulting in the loss of bank which then has to be reinforced by frequent rip-rap repairs. Repairs were made to the site in 1996 and 2004 and included placement of rock toes and barbs to protect the bank.

The contributing factors to the CED at this location are:

- *sediment bars and islands* deposited in the Naches at the mouth of Rattlesnake Creek split flow sending flows toward the eroding left bank;
- *inflow from Rattlesnake Creek* tends to increase the amount of impinging flow and turbulent energy put on the left bank;
- the *alluvial fan* at the outlet of Rattlesnake Creek exacerbates the problem by holding the Naches River in place against the site;
- A plan and profile of the original highway design from 1926 shows the Naches River *occupying the planned alignment of the highway*, supporting the notion that the river's tendency is

to continue to erode the bank for the foreseeable future.

The rock repairs made in 1996 seem to be holding the road prism; however the smoothing of the bankline has allowed erosive forces of the river to transfer to unprotected areas immediately downstream, necessitating the additional repairs that occurred in 2004. This caused the problem to again transfer further, downstream which is evident from the slumps and scalloped banks, Figure 2.

FISH UTILIZATION & HABITAT AVAILABILITY

Bull trout/Dolly Varden, spring Chinook, coho, summer steelhead, winter steelhead Redband/Rainbow trout and Westslope Cutthroat are present in Rattlesnake Creek. Bull trout and Chinook are currently listed as threatened under the federal Endangered Species Act. Chinook and steelhead are known to spawn and rear throughout the Naches mainstem; in Rattlesnake Creek, Chinook are found up to the wilderness boundary, while steelhead distribution is presumed to extend to natural barriers in the creek and its tributaries. Habitat availability for spawning and rearing in the Naches River portion of the assessment reach is limited by the confinement of the channel, lack of bed and bank complexity, and relatively large (cobble/boulder) substrate. The portion of Rattlesnake creek within the assessment reach is considered to provide good to excellent spawning habitat for steelhead, and fair to poor spawning habitat for spring Chinook depending on fall flows.

ONGOING WORK

A Site and Reach Assessment has been conducted by WSDOT Hydrology staff. The assessment identifies a preferred alternative that will either eliminate or incorporate the riprap repairs including rock toes and barbs and greatly reduce or eliminate the propagation downstream of WSDOT's maintenance problem and the negative impacts to fish habitat.

Road relocation, groins, buried groins, engineered logjams, roughness trees, log toes, rock toes, woody plantings, and Rattlesnake Creek flow redirection were evaluated as alternative solutions to the erosion problem. Most of these solutions resulted in prohibitive habitat damage, constructability problems or cost issues. The preferred alternative for this dynamic system is a rock toe, combined with woody plantings and biotechnical treatments (e.g. soil lifts) on the upper bank. This solution will accomplish the following;

- reinforce the bank and provide adequate resistance to shear stress.
- Rock toes would require minimal excavation into the road prism
- would have a much smaller footprint in the river channel compared to groins and engineered logjams
- Small spur structures could be included in the treatment to add roughness
- anchoring points for accumulation of LWD.

Construction Summer 2008

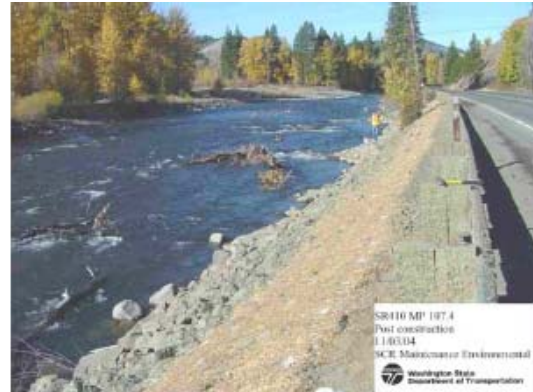


Figure 1. Rattlesnake confluence with the Naches River @ MP 107.5 CED site.

