

Fife Creek Check Dams and Sackcrete Removal Project

Introduction

During the late 1960's concrete check dams, rip-rap and stream bank revetments were installed in Fife Creek within Armstrong Redwood State Reserve with the intent of alleviating bank erosion. Immediately following the installation of the check dams, park staff recognized the negative affect of the check dams on Fife Creek. Since the installation of concrete checkdams and sackcrete revetments within Fife Creek, sediment has aggraded behind the check dams, eliminating or reducing summer flows and flattening the channel gradient. This has resulted in lateral bank erosion as the channel increases its meander amplitude in response to the lower gradient. In response to bank erosion, stream-bank revetments were installed in an effort to armor or protect stream banks. While the stream-bank revetment has reduced stream-bank erosion where installed, it has resulted in increased erosion where stream banks have not been armored. Further, sackcrete revetments eliminates riparian vegetation and instream habitat (such as overhanging banks), are subject to sudden failure, reduces channel sinuosity and complexity and does not allow for channel response to changing conditions.

Between 2000 and 2003 forty-one check dams were removed from Fife Creek within ARSR. This project proposes to remove most of the remaining sackcrete over a three to five-year period. Specifically, this project will remove approximately 750 linear feet of sackcrete and concrete rubble from within Fife Creek in Armstrong Redwoods State Reserve (ARSR) and place natural revetments of logs, rock, brush mattresses and/or live plantings to stabilize the stream banks.

Future projects within the Fife Creek watershed include the implementation of sediment source reduction prescriptions and continued invasive species control. These measures constitute a long-term program geared toward the restoration of predevelopment processes and biota to the Fife Creek watershed, with the ultimate goal of returning Fife Creek to a naturally functioning stream.

Location

ARSR is located approximately 2 miles north of the town of Guerneville in Sonoma County, California. The Fife Creek watershed consists of a basin approximately 6.7 square miles in size. Originating at approximately 1940 feet at the south slope of McCray Mountain, Fife Creek flows to its confluence with the Russian River at 126 feet elevation in the town of Guerneville. ARSR is a 805-acre park containing primarily redwood and Douglas fir/mixed evergreen forest. ARSR contains some of the last remaining old-growth redwood in Sonoma County.

Project Need

These activities have resulted in a significant quantity of manmade structures within the stream channel of Fife Creek. Further, sackcrete eliminates aggradation associated with the check dams has significantly impacted rearing and spawning habitat for steelhead and possibly coho salmon as well as an assemblage of species associated with old growth redwood riparian habitat.

Project Description

Specifically, this project seeks to accomplish the following objectives:

- Restore the predevelopment processes and biota to Fife Creek
- Improve fluvial transport of bedload
- Extend Fife Creek's seasonal flow duration
- Reduce stream bank erosion
- Increase salmonid spawning habitat
- Provide an improved experience for visitors of ARSR

The goals of the project include the following:

- Remove 750 linear feet of sackcrete revetment and assorted rubble and rip rap from within Fife Creek
- Following revetment removal, install where appropriate, native plantings and log stabilizing structures to minimize bank erosion associated with construction related disturbance
- Monitor channel adjustments following removal of check dams and revetments through channel cross sections, profile and photo monitoring
- Adapt project goals based upon channel response

Implementation of this project will follow Best Management Practices as outlined in Attachment B. Prior to the start of construction limits of construction, staging and stockpiling areas will be clearly identified and delineated by the Resource Ecologist. Erosion control shall be installed along the margins of construction areas on the downslope side of the site where slopes are in excess of 30 percent. In areas where native vegetation is likely to be impacted, salvage will occur when possible. These plants will be used to revegetate the site following construction activities. Removal of the sackcrete revetments will occur using heavy equipment with an impact hammer attachment for demolition and an excavator for removal. All concrete will be trucked off site to a concrete recycling facility. Non-recyclable debris shall be disposed of at a licensed landfill. Log stabilizing structures shall be placed using heavy equipment and/or manual labor. Following completion of construction activities, disturbed areas shall be secured with appropriate erosion control and cleaned of all construction debris.

Special Considerations

The district Resource Ecologist identified potential impacts associated with the implementation of this project. In consideration of these issues the project has been designed and scheduled to avoid significant adverse impacts.

1. Wildlife

Implementation of the proposed project has the potential to result in impacts to state and federally listed steelhead (*Oncorhynchus mykiss*), and northern spotted owl (*Strix occidentalis caurina*). Steelhead and northern spotted owl are known to inhabit ARSR. The project has been designed to avoid impacts to listed species found within the vicinity of the project site.

The project boundaries occupy a section of Fife Creek that is intermittent. As of July 1, the project area had no remaining surface water. Typically, Fife Creek has no surface flows from mid-April through early December. Surface flows within Fife Creek typically return following soil saturation. Soil saturation occurs following approximately 6 inches of cumulative rainfall. It is anticipated that the construction

activities will have been completed prior to the first rains. Within ARSR, juvenile salmonid habitat is found approximately 1000' upstream of the project site. Steelhead will not be adversely affected by construction of this project and are likely to benefit from the removal of the remaining check dams.

Northern spotted owl presence has been documented within Armstrong Redwoods. The proposed project could likely result in noise disturbance to nesting northern spotted owl, however the project will not result in habitat alteration. USFWS has determined that the use of mechanized equipment may occur within 0.25 mile of NSO habitat between July 10 and January 31 without impact to breeding.

Impacts to listed species are not considered a significant adverse impact.

2. Water Quality

Check dams will be removed using an excavator. The reach of the excavator lends flexibility in the location of construction staging areas in order to minimize disturbance to soils and sensitive habitats.

Disturbed areas may result in an increase in erosion. Therefore, following completion of the construction activities appropriate erosion control and seeding shall occur in all disturbed areas.

Water quality is likely to be impacted by work in a "live stream" and following the first winter rains. In order to avoid impacts to wildlife and water quality, all work will occur in the dry season, when the mainstem of Fife Creek within ARSR does not have surface flows. To avoid impacts to water quality all work will be completed by October 15. In the unlikely event that cumulative rainfall totals exceed 6 inches prior to October 15th, work will be halted until the following September.

Impacts to water quality are not considered a significant adverse impact.

Discussion

Implementation of this and future watershed projects are expected to result in a self-maintaining stream system within Armstrong Redwoods State Reserve. The expected outcome will allow the stream to display a range of conditions dictated by the biological and physical characteristics of the watershed and its natural disturbance regime. Stream monitoring efforts will assist in the identification of any small adjustments or corrective actions should they become necessary.