Proposition 204 Final Report (Hosselkus Creek - Summer, 2002) :

Background: The Hosselkus Creek project was implemented on private land owned by the Neff family in Genesee Valley, Ca. Hosselkus Creek drains a 14.7 mi2 watershed that receives an annual precipitation of 35 inches. A geomorphic reconstruction of the degradational history indicates that the channel was likely moved to the side of the meadow to facilitate bridge construction. This realignment, without attendant channel structure resulted in the rapid downcutting exhibited on the landscape. This downcutting resulted in a lowering of the shallow meadow water table and subsequent conversion from mesic site plants to a xeric site vegetative community. The creek was subject to several gravel dredging/channelization efforts by the county road department in the 1970's and 80's for bridge protection.

Management changes were implemented in the mid-1980's, in order to encourage natural regeneration of riparian plants. However, the high supply of coarse bedload and lack of wood/vegetative structure left these efforts fruitless. The FR-CRM, meanwhile, had been working with the concept of re-connecting stream channels with their naturally evolved floodplains (Big Flat, 1995; Bagley Creek, 1997; Boulder Creek, 1997). Hosselkus Creek appeared to be a prime candidate for this treatment. To this end, at the request of the Neff Ranch, this project was incorporated into the Proposition 204 grant request and subsequent contract.

Implementation: Hosselkus Creek was scheduled to be constructed early in the contract period. This is due to the Neff Ranch funding the initial data collection/analysis and conceptual design development prior to the grant submittal. However, final design and permitting were delayed in an effort to coordinate with a nearby project proposed by the Burlington Northern Santa Fe Railroad (BNSF). BNSF proposed to build a 2.5 mile long siding track in Indian Valley. This siding project was to result in the destruction of several acres of wetland along Wolf Creek. As part of the mitigation, BNSF agreed to carefully remove and transport the existing wetland vegetation to a nearby FR-CRM project. Hosselkus Creek with its dearth of vegetation was the most likely candidate for this infusion of mature vegetation. To this end, the FR-CRM delayed the implementation of the project for two years, concurrent with postponements made by BNSF in their project. In 2002, BNSF again postponed the siding project and the FR-CRM TAC quickly developed an alternative design with less vegetation and more earth-moving and rock. Construction began in June 2002 and was completed in mid-July 2002. The initial budget for the project was $136,675, including all final design, permitting and construction costs.

The Hosselkus Creek final design entailed the FR-CRM's first efforts at large-scale transportation of riparian vegetation from off-site to a project. In addition, this was accomplished in the heat of summer. The vegetation was purchased from a local rancher and harvested from fence and field margins. The material was harvested with an excavator loaded into 10-wheel dump trucks and hauled 18 miles to the project. The material was received with a second excavator and placed directly into pre-excavated holes. A water truck was standing by at all times to pre-water the holes and then water in the backfill material. Additionally, a spur-of-the-moment collaboration with CalTrans and Robert Peacher Construction of Chico, Ca. enabled FR-CRM staff to arrange transplanting mature willow from a highway widening project near Crescent Mills to the project. These were excellent plants, acquired at no cost beyond the transportation.

The plants were supported with the water truck throughout the construction period. At the end of construction a drip irrigation system was installed to support the plants until the onset of fall rain. Plant survival was approximately 85%.

The construction contract was advertised by the Plumas County Dept. of Public Works (DPW) and awarded to Wilburn Construction of Quincy, Ca. The project entailed the excavation and placement of 17,000 yds3 of fill for the gully obliteration. This resulted in three ponds and three plugs. Streamflow was re-directed into a remnant channel that was spot treated with much of the above referenced vegetation transplants. In anticipation of distributing streamflows across the valley, an array of six culverts were installed under the county road in a remnant channel on the east side of the valley. This array provides for a main channel culvert with five floodplain culverts set at a slightly higher elevation. This configuration more closely mimics the natural movement of flood waters down the valley. The design also required approximately 350 yds3 of rock. The rock was used to construct a valley and channel grade structure at the county road bridge. This structure, as well as the culvert array installed in the east side of the valley, is to accommodate large floods without damaging the project or the county road.

Monitoring/Results: The monitoring effort at Hosselkus Creek consists of ground water level monitoring data collected from 1998 through 2002 and vegetation pre-project monitoring data collected in 2002. Groundwater monitoring wells had been installed in 1998 under a grant from the Regional Council of Rural Counties (RCRC) in anticipation of future project work. Because the project was not completed until July 2002, there is very little post-project monitoring data, and the project is just now going through its first winter. Both of the winters previous to the project were mild (about 40% normal precip for water year 2001, and 70% of normal for water year 2002.)

Groundwater monitoring:

Wells: This monitoring regime consists of six groundwater monitoring wells, placed in pairs along three surveyed and monumented cross-sections, with one well closer to the creek, and one farther away. Figure 8 shows the location of the monitoring wells. Wells 1 & 2 are on cross-section #1, and are located approximately 1,200 feet upstream of the project. Well 1 is the only well that is on the west side of the gully. Wells 3 & 4 are on cross-section #4. This cross-section is just upstream of the head of the remnant channel that was modified and designed to carry the flow that used to go in the now-obliterated gully. Wells 5 & 6 are on cross-section #6, in line with the most-downstream plug, and are near the road.

Each well is constructed of perforated ½" galvanized pipe, with a cap on the bottom and a cap on the top. The depth of each well varies with the ability to drive the well in with a slide-hammer. All wells are driven in using the same protocol- a hammer is placed at the top of the well, four feet up, and dropped. The number of blows and depth of each well is displayed in Table 5.

Table 5. Hosselkus well depths and installation

Well #	**Depth (ft) from ground surface**	**# blows**
HC1	**4.5**	**465**
HC2	**3.8**	**377**
HC3	**2.8**	**392**
HC4	**2.4**	**434**
HC5	**8.2**	**?**
HC6	**10.2**	**?**

Figures 9, 10, and 11 display the results of well monitoring. Wells are monitored by dropping a probe down the pipe, which buzzes when it hits water. The depth of water is recorded. Wells were read about once every 2-3 months.

Discussion: Again, it should be noted that there was only about 40% of normal precip for water year 2001, and 70% of normal for water year 2002. Prior to that, there was a flood in January 1997, and more or less normal water years in 1998, '99, and '00.

The graphs in Figure 9 reflect the fact that both of these wells were very shallow (bottoming on an impenetrable large cobble layer). It has been interesting to note water in well 2, longer into the year, when the other wells were dry. Perhaps well 2 is near an underground spring.

Well 4 (Figure 10) broke in early 2002. It was only just repaired in November 2002. Peaks in groundwater can be seen up to spring 2000, but the groundwater has not had such a pronounced peak since then, reflecting the poor winter precip in 2001 and 2002.

Well 6 (Figure 11) also broke in early 2002, and was also repaired in November 2002. Both well 5 & 6 are deeper than the other wells, and show a 4-6 foot annual fluctuation in groundwater elevation.

As state above, the project was not constructed until early summer 2002. Hosselkus Cr was dry at the time of construction, and precipitation was not significant up to the last well reading for this report. Hence, the effects of the project on groundwater have not yet showed in the wells. Post project monitoring is expected to show longer and higher peaks of groundwater in wells 3, 5, and 6. It will also be interesting to see if the project's influence on groundwater elevation extends out to well 4, and up valley to wells 1 & 2. We are experiencing a major storm as we write this report, and expect to see significant differences in well water levels next season.

Vegetation Monitoring: Vegetation was monitored just before project construction in June 2002 at each well (except well 4) by placing a tape 50' toward the east, and 50' toward the west, and categorizing the vegetation at the boot tip at two-foot intervals. Table 6 (hard copy only) displays the percentage of vegetation categories at each well before the project. The first post-project vegetation monitoring will be in June 2003.

It should be noted that wells 3 & 5 are within the exclosure fence, and were not subject to grazing pre-project, nor will they be subject to grazing until vegetation has recovered after the project. The other wells are all within grazed areas.

A visual scan of the meadow at Hosselkus Creek immediately reveals heavy star thistle infestation. The meadow was chemically treated with Transline in early summer 2001. Star thistle were still persistent in 2002, but the meadow was not treated again. Unfortunately, the vegetation monitoring at the wells did not pick up any star thistle. Star thistle is known to thrive in drier areas, because its long tap root can access water that other plants can't get. We are curious if the project effects increase floodplain surface water and ground water enough to control the star thistle. We will add 1 or 2 vegetation transects in a thick star thistle patch (in June 2003, last year's dead plant material should be easily recognizable) to see if there are changes.

Star thistle also thrives in disturbed soil. The project necessarily disturbed a lot of soil. Revegetation on the plugs will also be monitored post-project. Plugs were re-vegetated with the seed bank in the top soil that was removed, stock-piled, and spread on top the plugs, as well as with 41 lbs. of native seed spread over 5 acres in November 2002. Because of the dryness of the site, immediately after construction, the plugs and the new channel were irrigated. The FR-CRM also plans to monitor revegetation of the plugs.

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