STREAM INVENTORY REPORT

Carson Creek

WATERSHED OVERVIEW

Refer to the map of McKenzie Creek for the location of Carson Creek.

Carson Creek is tributary to McKenzie Creek, a tributary to Sproule Creek, a tributary to South Fork Gualala River, a tributary to the Gualala River, located in Sonoma County, California. Carson Creek's legal description at the confluence with McKenzie Creek is T08N R12W S05. Its location is 38E33N53.4O north latitude and 123E12N17.1O west longitude. Carson Creek is an intermittent stream according to the USGS Fort Ross 7.5 minute quadrangle. Mixed hardwood and mixed conifer forest dominates the watershed. The watershed is primarily privately owned.

HABITAT INVENTORY RESULTS AND DISCUSSION

Adrianne Carr and Jennifer Jenkins (WSP/AmeriCorps) conducted the habitat inventory of July 15-16, 1999. The total length of the stream surveyed was 6834 feet.

Carson Creek is a B4 channel type for the entire stream surveyed. B4 channels are moderately entrenched, of moderate gradient (2-4%), dominated by riffles, with mainly gravel substrate. The suitability of B4 channel types for fish habitat improvement structures is: excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors, and log cover.

The air temperatures recorded on the survey days ranged from 61 to72 degrees Fahrenheit. Water temperatures ranged from 56 to 68 degrees Fahrenheit. This is an unsuitable range of water temperatures for salmonid rearing. It exceeds the upper values for both coho salmon and steelhead trout preferred ranges (60 and 65 degrees Fahrenheit, respectively).

Based on the total length of this survey, Level II habitat units consisted of 44% pool units, 42% flatwater units, 13% riffle units, and 1% dry units (Table 1). The pools are relatively shallow, with a mean depth of 1.0 feet (Table 3) and only 21of the 67 pools having a maximum depth greater than 2 feet (i.e. 31% primary pools) (Table 3).

The mean shelter ratings for pool and flatwater habitats were low with ratings of 3 and 18, respectively. The shelter rating in the riffle habitats was moderate with a rating of 48. A desirable shelter rating is approximately 100. Log and root wad cover structures in the pool and flatwater habitats are needed to improve both summer and winter salmonid habitat.

Three of the four low gradient riffles fully measured had gravel as the dominant substrate; one unit had small cobble as the dominant substrate. This is generally considered good for spawning salmonids. Of the other 14 fully measured habitat units, ten were dominated by gravel, three by bedrock, and one by sand (Table 6).

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The mean percent canopy density for the stream was 84% (Table 7). This is a relatively high percentage of canopy, since 80 percent is generally considered optimum in north coast streams. The percentage of right and left bank covered with vegetation was also relatively good at 70% and 78%, respectively (Table 7). This would put both canopy and bank revegetation projects at a low priority.

Fish were observed throughout the entire survey, except for in the last habitat unit sampled, 6722' above the confluence with McKenzie Creek. A large debris accumulation in this unit impedes further passage.

BIOLOGICAL INVENTORY RESULTS

One site was electrofished on September 10, 1999, in Carson Creek. Doug Albin (DFG) and Adrianne Carr (WSP/AmeriCorps) sampled this unit.

The site sampled was habitat unit 5, a mid-channel pool, 129' from the confluence with McKenzie Creek. This site had an approximate length of 77'. The site yielded two 0+ steelhead trout, two 1+ steelhead, and 4 minnow/roaches.

RECOMMENDATIONS

1) Carson Creek should be managed as an anadromous, natural production stream.

2) The limited water temperature available suggest that the maximum temperatures are within/above the acceptable range for juvenile salmonids. To establish more complete and meaningful temperature regime information, 24-hour monitoring during the July and August temperature extreme period should be performed for 3 to 5 years.

3) Where feasible, design and engineer pool enhancement structures to increase the number of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.

4) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover is from boulders. Adding high quality complexity with woody cover is desirable and in some areas the material is at hand.

5) Inventory and map sources of stream bank erosion and prioritize them according to present and potential sediment yield. Identified sites, like the site at 6---', should then be treated to reduce the amount of fine sediments entering the stream.

6) Active and potential sediment sources related to the road system need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.

7) Increase the canopy on Carson Creek by planting willow, alder, redwood, and Douglas fir along the stream where shade canopy is not at acceptable levels. The reaches above this survey section should be inventoried and treated as well, since the water flowing here is effected from upstream. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

8) Spawning gravel on Carson Creek are limited to relatively few reaches. Crowding and/or superimposition of redds have been observed during winter surveys. Projects should be designed at suitable sites to trap and sort spawning gravel in order to expand redd site distribution in the stream.

9) There are several log debris accumulations present on Carson Creek that are retaining large quantities of fine sediment. The modification of these debris accumulations is desirable, but must be done carefully, over time, to avoid excessive sediment loading in downstream reaches.

10) There are at least two sections where the stream is being impacted from cattle trampling the riparian zone and defecating in the water. Alternatives should be explored with the grazier and developed if possible.

11) Due to the high gradient of the stream, access for migrating salmonids is an ongoing potential problem. Good water temperature and flow regimes exist in the stream and it offers good conditions for rearing fish. Fish passage should be monitored and improved where possible.

PROBLEM SITES AND LANDMARKS

The following landmarks and possible problem sites were noted. All distances are approximate and taken from the beginning of the survey reach.

Position (ft):	Comments:
0	Begin survey at confluence with McKenzie Creek. Young-of-year (YOY) salmonids observed. Trail on right bank leading down to creek.

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39	YOY observed.
75	YOY observed.
98	YOY observed.
129	YOY observed.
250	YOY observed.
303	YOY observed.
327	Lots of YOY and 1+ observed. One 2+ observed. House on right bank.
389	Water pump and dead tire on right bank. Road crossing. See diagram in field notes.
466	YOY and juvenile salamander observed.
485	YOY observed.
570	Confluence with Camper Creek. YOY observed.
679	Bridge measures 11’ high x 56’ wide x 9.5’ long. Bridge is one year old, it replaced an old wooden bridge. Channel is bedrock bound through habitat unit #017.
761	1+, YOY and newts observed.
839	1+, YOY and newts observed.
879	Many YOY observed.
930	Road on left bank side, 30' to 50' uphill from wetted channel.
994	Road on left bank side, 30' - 50' uphill.
1122	YOY observed.
1161	YOY observed.
1178	YOY observed.

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1315	Young-of-year and 1+ observed. Tail crest is pea gravel. 2' undercut banks and 2' bedrock ledge on other side.
1384	YOY and a frog observed. Unit has bedrock bottom.
1589	3' undercut bank.
1629	Large boulders and rootwad forming this pool above last unit. Pool flows around large root mass with live tree attached to it in the middle of the channel. There is a small debris accumulation behind boulders and root mass with about 10 cubic yards of gravel/cobble behind a few logs.
1663	Nice root mass in channel on right bank side. Dead crayfish observed.
1706	Root mass on left bank at beginning of unit. YOY observed.
1745	YOY observed.
1803	Pool tail crest is pea gravel. YOY and a frog observed.
1909	Large debris accumulation (LDA) measures 9’ long x 25’ wide x 6’ high.
1962	YOY observed.
1998	Tail crest consists of pea gravel.
2031	YOY observed.
2076	Newts and juvenile salamander observed.
2147	YOY observed.
2270	Channel splits in two and reconnects at the end of unit. There is a gravel bar in the center of the channel. Right bank slide measures 50' long x 300' high (estimate). This slide is taking a road out with it. Road has been running along right bank side. Pine trees have been planted. Lots of YOY observed.
2413	YOY and 1+ observed.
2472	High gradient unit with big boulders in channel.

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2526	Frogs observed.
2595	LDA measures 30’ long x 25’ wide x 8’ high. YOY and 1+ observed.
2655	YOY observed.
2721	YOY observed. 3.5' undercut banks.
2756	Spring enters on left bank side.
2794	Historic slide on right bank. Two years ago it slid significantly. Slide is more than 500 cubic yards. Spring trickling down right bank. Right bank road upslope.
2832	Slide continues on right bank. Old getaway box and old culvert on right bank (getaway box diverts flow coming out of the culvert directly to the creek to avoid it flowing over the slide). YOY observed.
2850	End of right bank slide. YOY observed.
2917	Entire pool covered by LDA.
3005	Old road on left bank, up 20'. YOY observed.
3029	Root wad with 3' of shelter underneath.
3060	YOY observed.
3101	1' undercut bank.
3201	YOY observed.
3275	YOY observed.
3302	YOY observed.
3373	Bedrock channel. YOY, 1+ and newts observed.
3443	1+ observed.
3505	Confluence with Wild Hog Creek.

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3551	YOY observed.
3594	YOY, 1+ and newts observed.
3658	Many YOY observed.
3739	YOY, 1+ and frogs observed. LDA measures 60’ long x 20’ wide x 10’ high.
3875	2' undercut bank. LDA measures 21’ long x 20’ wide x 4’ high.
3906	Wood bridge measures 5.5’ high x 15’ long x 5’ wide. Lots of fish observed in this unit.
4041	YOY observed.
4069	YOY observed.
4113	YOY observed.
4155	Right bank bedrock. Right bank road 20' away from wetted channel.
4197	Right bank road 20' above channel.
4208	Right bank road 20' from channel.
4354	YOY observed.
4502	Spring enters on the right bank
4530	YOY observed.
4694	Cavern with 5' undercut. Lots of YOY observed.
4781	Pool tail crest is pea gravel. Water intake line with 1" diameter.
4824	YOY observed.
4902	YOY, 1+ and a frog observed. 1.5' undercut bank.
4999	YOY observed.

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5045	YOY and 1+ observed.
5154	YOY observed.
5204	Old road crossing. LDA measures 50’ long x 12’ wide x 5’ high.
5274	YOY, newts, and algae observed. Old slide at beginning of unit on right bank side measures 100’ high x 70’ long x 15’ deep.
5308	Many YOY observed.
5534	YOY and 1+ observed.
5601	YOY observed.
5646	YOY and frogs observed.
5674	YOY observed.
5706	Many fish observed.
5745	Spring enters right bank and old slide begins. Slide measures 15’ long x 15’ high x 6’ deep. YOY observed.
5783	LDA measures 20’ long x 5’ wide x 4’ high. Most of the debris is on the right bank side.
5845	Undercut bank of 2'-5'. YOY and 1+ observed.
5916	Right bank slide measures 50’ high x 3'-15' deep.
5962	YOY observed.
5999	YOY and a frog observed.
6131	2' undercut bank. LDA measures 20’ wide.
6291	4.5' undercut bank. Root mass on right bank provides shelter. YOY and 1+ observed.
6403	Pool tail crest is pea gravel. YOY observed.

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6428	Clay slide, still bleeding, on left bank along this unit, measures 34’ long x 10’ high x 4’ deep. 2’ undercut banks. Azaleas over whole unit. YOY observed.
6498	Large boulder, left bank. YOY observed.
6519	Lots of YOY here.
6672	Dry tributary on right bank. YOY observed.
6722	Debris slide on left bank measures 50’ high x 20’ long x 3’ deep. LDA measures 17’ high x 40’ long x 50’ wide. More than 6000 cubic yards of sediment/gravel behind log jam. Creek is dry above log jam. End of anadromy.