

APPENDIX 5.5.1.5-A

CARMEL RIVER LARGE WOODY DEBRIS INVENTORY
FROM STONEPINE TO CARMEL LAGOON
FALL 2003



*Central
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Studies*

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**Carmel River
Large Woody Debris
Inventory from
Stonepine
To Carmel Lagoon
Fall 2003**

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Preface

The following report documents the Fall 2003 locations and characteristics of large woody debris along the lower reach of the Carmel River in California, from Stonepine Bridge to the Carmel Lagoon. The report includes an ArcMap GIS project and electronic spreadsheets containing the data presented in the appendices to this report.

This report may be cited as:

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A pilot study was completed in 2002:

Smith, D.P., Huntington, P, and Harter, K., 2003, Carmel River Large Woody Debris Inventory from San Clemente Dam to the Lagoon Fall 2002: Watershed Institute, California State University Monterey Bay, Publication No. WI-2003-13, 38 pp.

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1 Executive Summary

Large woody debris (LWD) in the Carmel River includes significant branches, trunks, and accumulations of dead wood lying in, or near, the active channel. LWD plays myriad roles in the life cycles of aquatic and terrestrial biota. Its utilization in the biosphere ranges from being a substrate for microbes to serving as shelter and resting places for western pond turtles (*Clemmys marmorata*) and Federally-threatened California red-legged frogs (*Rana aurora draytonii*) and endangered steelhead (*Oncorhynchus mykiss*). LWD is utilized by every level of the food chain from microbes to large predators; its typical occurrence, half submerged, half exposed, makes it an intersection between aquatic and terrestrial riparian habitats. LWD is also considered to be a factor in channel shape, bank stability, bridge safety, and aesthetics. Few studies have been undertaken to analyze the amount, location, and function of LWD in the rivers of central coastal California from the San Francisco Bay to Santa Barbara County.

We present the results of a comprehensive inventory of LWD on the lower Carmel River undertaken in summer and fall of 2003. The precise position of each piece of wood falling within the definition of LWD was recorded and plotted using GPS/GIS technology or was plotted using high resolution aerial photographs; each piece was then assessed in several ways to improve our understanding of the biological and physical function of wood in the river. These data are summarized in graphical and tabular format, and as GIS layers in an accompanying ArcMap 8 GIS project.

Our 2003 survey did not include the reach from Via Mallorca at River Mile (RM, measured from the ocean) 3.2 to the Carmel Lagoon (RM 0.5). We use data from a pilot study conducted in 2002 to fill in that data gap. We recognize that this approach might introduce small errors if wood in this reach moved during the subsequent 2002–2003 flows. We believe that the combination of relatively low peak discharges in winter 2002–2003 and relatively large average size of LWD in this reach lowers the risk of introducing significant errors. We feel confident that the combination of 2003 data from the majority of the river and 2002 data from the lowest reach provides a relatively complete snapshot of the LWD in the Carmel River at the beginning of the 2003–2004 rainy season.

The 2003 survey reached to within 5 km (3 mi.) of San Clemente Dam. This upper section contains a great surplus of LWD. The time and effort that would be required to catalog the LWD at a comparable scale to the rest of the river put this reach outside the limits of the project budget. For this reason we focused our efforts on the lower 25.5 km (16 miles) of river.

We conclude the following points.

2003 Inventory

- A comprehensive survey was completed on 23 km (14 mi) of the Carmel River. In this section of river there are 471 occurrences of large wood or large wood accumulations. This figure leads to an average frequency of 20.5 significant LWD pieces (or accumulations) per kilometer of river (36.7 occurrences/mi).
- The density is not evenly distributed; the density decreases downstream at an average rate of approximately 0.8 pieces/km ($p < 0.01$) and shows marked non-linear variability.
- 71% of LWD pieces are between 15 cm and 30 cm in diameter. 84% of the wood is between 1.5 m and 6 m in length. There is an increase in LWD size downstream from Via Mallorca.
- 70% of the LWD in the Carmel River has no significant impact lateral channel stability, or is protecting the banks from erosion. Only 3% of the wood was causing bank erosion.
- 29% of the wood was fostering pool habitat in the bed.
- 77% of the naturally occurring woody debris tends to be aligned either parallel with the bank or pointing downstream. Only 9% were angled upstream and 12% were perpendicular to flow.
- 50% of the occurrences of wood were associated with aquatic fauna sightings, commonly with multiple taxa per sighting. Fauna included steelhead trout, stickleback, crayfish, western pond turtles, California red-legged frogs, and bullfrogs.
- 7% (35 pieces) of the LWD surveyed in 2003 had been deliberately placed in the stream for management purposes.

2 Introduction

Large woody debris (LWD) has been the focus of considerable research. It is considered to be a great benefit to natural river function, a threat to bridges, and a factor in flood risk. There is currently interest in quantifying the ecosystem benefits of LWD, understanding the role of LWD in channel stability, and determining how much LWD is optimal or minimal for riverine ecosystems and bank stability.

Recent research has identified a substantial number of specific benefits of LWD (Harvey et al., 1999; Harmon et al., 1986; Maser and Sedell, 1994; Flosi et al., 1998; Montgomery et al., 2002; Triska and Cromack, 1980; Franklin et al., 1981). Environmental benefits of LWD, which apply directly to the Carmel River (Fig. 1) include:

- fish resting zone during high flow
- shade and cover for juvenile and adult fish
- traps gravel for spawning habitat
- perching platforms for reptiles, amphibians, aquatic insects, birds, and riparian mammals
- forces bed scour and pool formation for habitat diversity
- bank protection
- collection of organic matter (leaves and other detritus)
- provide nutrients to the river and near-stream soils
- physical and nutritional support for macro- and aquatic microbes
- trap soil to provide substrate for new vegetation
- adds hydraulic roughness to break-up and slow flood waters, thereby reducing the erosional forces.

Because LWD spans the physical realm between purely aquatic and terrestrial parts of the river system, it serves as a biological bridge providing a flow of nutrients and energy between the two areas of the river corridor. Despite these benefits, if too much wood is present and logjams begin to develop, there can be some negative consequences including bridge damage, increased flooding, and temporary barriers to fish migration.

The present study provides an inventory and summary of LWD on the Carmel River between Stonepine Bridge and the coastal lagoon of the Carmel River. The data set represents the most detailed look at LWD in the Carmel River to date, and may be the most detailed LWD inventory in any Central California stream. In 2002, seven representative reaches of the Carmel River located between Tularcitos Creek and the Carmel Lagoon were inventoried for LWD (Smith et al., 2003). This sub-sample included eight miles of river channel, or 44% of the river. The current 2003 inventory repeated most of those reaches and included nearly all of the river between the Tularcitos Creek and Via Mallorca. In addition to providing a catalog of each piece of wood in or near the active channel, the data provide the opportunity to evaluate the physical function of the LWD in terms of bank protection and bed scour.

3 Methods

LWD is defined in the present study as any piece of wood with at least 15 cm diameter and 1.5 m length. The LWD was included in the survey if it occurred in the dominant channel of the Carmel River. By this, we mean the approximate bankfull channel, which, by our estimate, conveys approximately the 1.5 to 2 year flow. In the data tables there are also several instances of LWD that occurred on the floodplain adjacent to the channel, and these are so indicated; however, the scope of the study did not include all floodplain areas.

In the Fall of 2002 (October 5 – November 20) seven reaches of the Carmel River were surveyed for LWD (Smith et al., 2003; Fig 1). From upstream to downstream, these reaches include Stonepine Bridge to Lower Circle, Rosie's Bridge to deDampierre, deDampierre to the Carmel Valley Trail and Saddle Club, Garland Park downstream from Dan Juan Bridge, Scarlett Road to Robinson Canyon Road, Via Mallorca Road along the Rancho Cañada Golf Course, and from Rancho Cañada Golf Course to the head of the Carmel Lagoon. In summer and fall of 2003 thirteen nearly contiguous river reaches were surveyed. The 2003 survey included all of the above reaches, except for the last two. The following additional reaches were added in 2003: Garland Stables to Garland Park, Garland Park to the Narrows, Narrows to Scarlett Road, Robinson Canyon Road to Upstream of Schulte Bridge, Upstream of Schulte Bridge to Downstream of Schulte Bridge, and Quail Lodge Bridge to Via Mallorca. The 2003 survey did not repeat the reach from Via Mallorca (Rancho Cañada Golf Course) to the upstream end of the Carmel Lagoon, but we include that reach from 2002 in our overall analysis of the 2003 data (Fig. 1). This combination gives a more complete picture of the distribution of LWD at the beginning of the 2003–04 rains, and introduces few errors, since the majority of wood in that reach is large enough to have remained immobile during the two-year study period. In summary, this 2003 report includes the analysis of 15 reaches of the Carmel River, including the lowest two reaches that were surveyed in 2002. Figure 1 shows an additional reach (Stonepine to Sleepy Hollow), which was not completed and was not included in computing and reporting the LWD statistics in this report.

For clarification, the study reaches that refer to points upstream and downstream of Schulte Bridge do not have the bridge as an end point. "Upstream of Schulte Bridge" is a point approximately 850 m (+/- 10 m) upstream from Schulte Bridge, as measured along the thalweg of the river. "Downstream of Schulte Bridge" is a point 350 m downstream from Schulte Bridge, as measured along the thalweg of the Carmel River.

The upper limit of the study is Stonepine Bridge. The lower limit of the study, the Carmel Lagoon, was the point at which the water became too deep to wade during low-flow conditions of Summer 2002.

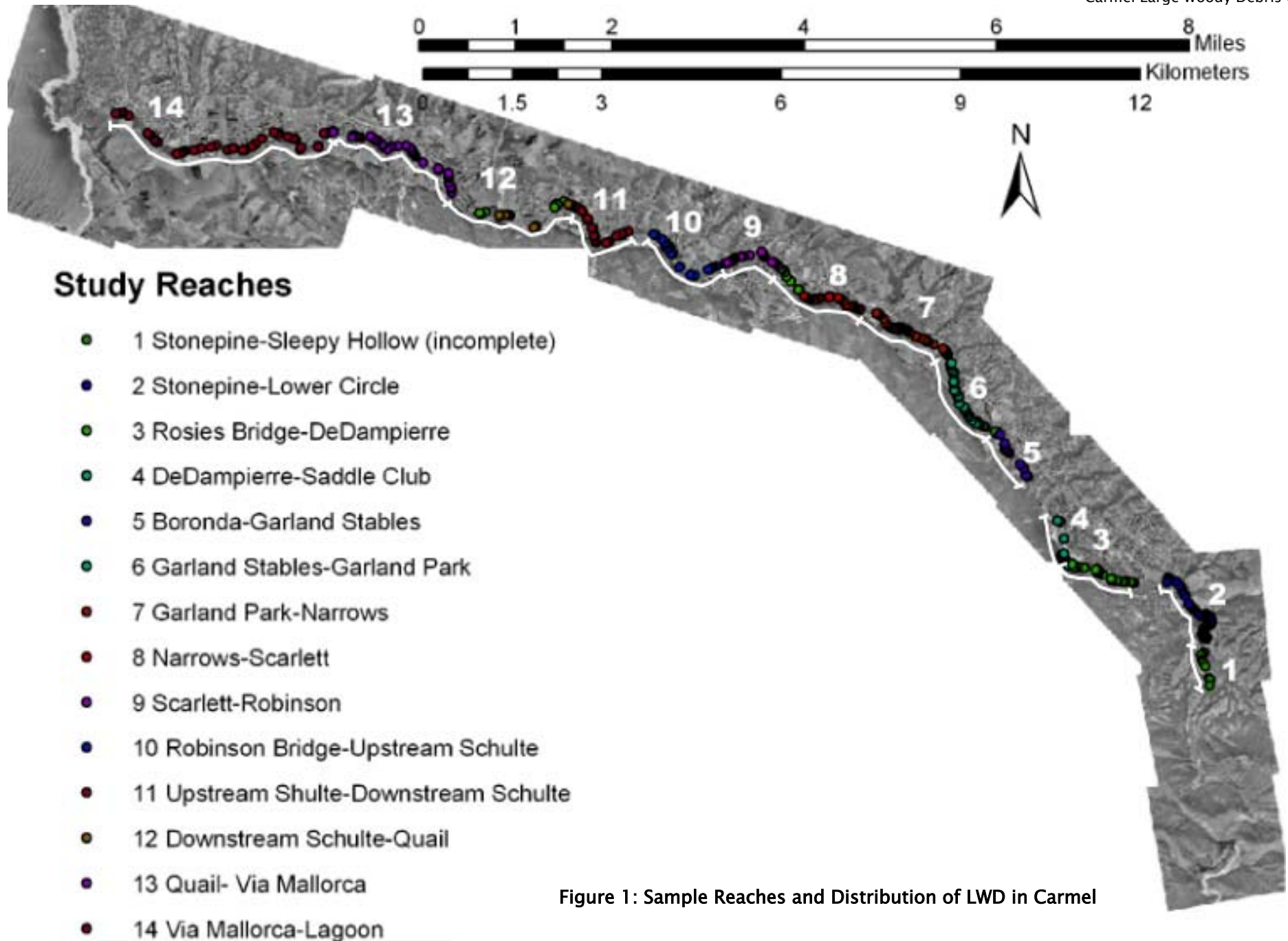


Figure 1: Sample Reaches and Distribution of LWD in Carmel

The great majority of locations reported in this inventory were obtained by differentially correcting GPS locations obtained with a handheld Trimble GeoExplorer-III receiver. The error of those locations is likely to be much less than 5 m. Several locations were obtained by reference to georeferenced, high resolution digital aerial photography (Mussetter, 2002)

California red-legged frog sightings reported here include a combination of positively identified individuals and frog sightings that were probably California red-legged frogs. Along the fifteen sample reaches, each occurrence of LWD or LWD accumulation was assigned coordinates and several kinds of data were collected (Table 1). Definitions of the data are provided in Appendix A. Sample data sheets are provided in Appendix B. We have provided digital photographs of 93 instances of LWD as part of the monitoring data. We have also tagged 29 pieces of LWD with circular brass-colored metal identifiers that will help track their progress in future studies (Fig. 2).

An ArcMap (v.8.2) GIS project was created that displays each single and multiple LWD occurrence projected on a very high resolution (0.5 ft/pixel), georeferenced aerial photograph provided by the Monterey Peninsula Water Management District (Mussetter, 2002). The attribute table in the GIS project contains all the data from the project as well.

Table 1: Data fields for Carmel LWD. See Appendix A for details.

DATA	BRIEF DESCRIPTION
Date and general river reach name	
Location	Eastings and northings in feet (NAD 1983 California State Plane Zone IV)
Log type	Single, multiple, +/- rootball
Width	Centimeters of diameter (15 cm minimum)
Length	Meters (1.5 m minimum)
#Pieces	Estimated number of pieces in a multiple log accumulation
Mobility	How frequently it might move based upon elevation and embeddedness
Influence	Influence on bed and bank protection or scour
Condition	Degree of wood decay
Embedment	How well anchored the wood is in the bed or bank
Orientation	Is the wood pointing upstream, downstream, parallel or perpendicular with respect to the bank?
Degrees from bank	A general index of acute angle between bank and log
Reach type	Hydraulic habitat (pool, riffle, run, or glide)
Projected reach type	Estimated hydraulic habitat at approximately 200 cfs
Reach length	Meters of extent of reach type
Part of channel	Center, edge of low flow channel, bankfull channel, floodplain
Substrate	Visual approximation median grain size category (sand, pebble, cobble, boulder, bedrock.)
Species	Species of log
Fauna	Animal sightings during survey
Comments	
Structural size	Approximate dimensions of LWD accumulations and jams Length X Width X Height (meters)

Figure 2: Attaching an identifying tag to a piece of LWD



4 Results

The data are provided in an electronic Excel file, and in Appendix C. A simple data summary stratified among the fifteen reaches is provided in Tables 2 and 3.

Table 2: Positions of fifteen sample reaches in 2002-2003 LWD survey. Right two columns are the frequency of single pieces and accumulations per kilometer (mile) of channel in each reach.

Reach	Reach Length (km)	Cum. dist (km)	Cum. dist (mi.)	Occurrences of LWD	LWD/km	LWD/mi
Stonepine-Lower Circle	1.59	1.6	1.0	65	41	68
Rosie's Bridge-deDampierre	1.18	2.8	1.7	31	26	44
deDampierre-Saddle Club	0.93	3.7	2.2	17	18	30
Boronda-Garland Stables	1.3	5.0	3.0	28	22	36
Garland Stables-Garland Park	1.31	6.3	3.8	34	26	43
Garland Park-Narrows	1.68	8.0	4.8	46	27	46
Narrows-Scarlett	1.67	9.7	5.8	39	23	39
Scarlett-Robinson	1.01	10.7	6.4	22	22	36
Robinson-Upstream Shulte	1.58	12.3	7.4	24	15	25
Upstream Shulte-Downstream Shulte	1.16	13.4	8.0	20	17	29
Downstream Shulte-Quail Lodge	2.54	16.0	9.6	49	19	32
Quail Lodge-Via Mallorca	2.54	18.5	11.1	43	17	28
Via Mallorca along R. Cañada (2002)	2.27	20.8	12.5	32	14	23
Rancho Cañada-Lagoon (2002)	2.203	23.0	13.8	21	10	16

Table 3: Summary statistics for key variables in the dataset. Other variables are present in the data sheets.

Reach	Pieces		Single (%)	Only rootball	Rootballs present (%)	Diameter (% of total in cm ranges)				
	Total	Multiple (%)				15-30 cm	30-45 cm	45-60 cm	>60 cm	unknown
Stonepine-Lower Circle	65	38	61		32	76	15	8	1	0
Rosie's Bridge-deDampierre	31	26	74		29	74	16	6	3	0
deDampierre-Saddle Club	17	29	65	6	71	35	12	6	47	0
Boronda-Garland Stables	28	18	82		25	86	11	4	0	0
Garland Stables-Garland Park	34	50	50		32	76	0	24	0	0
Garland Park-Narrows	46	22	76		20	89	9	2	0	0
Narrows-Scarlett	39	8	87	5	39	84	8	8	0	0
Scarlett-Robinson	22	41	59		32	82	14	5	0	0
Robinson-Upstream Shulte	24	41	59		4	67	25	8	0	0
Upstream Shulte-Downstream Shulte	20	25	75		30	95	0	5	0	0
Downstream Shulte-Quail Lodge	49	8	92		10	37	2	57	4	0
Quail Lodge-Via Mallorca	43	16	82		28	47	33	19	2	0
Via Mallorca along R. Cañada (2002)	32	22	78		0	34	34	0	25	6
Rancho Cañada-Lagoon (2002)	21	38	62		0	33	43	5	19	0
Total and weighted means¹	471	26	73	1	24	66	15	13	5	2

1. Averages are weighted by the number of occurrences of LWD in each reach.

Table 3 Continued

reach	Length (% of total in m ranges)							Physical function (% of total with function) ¹			
	1.5-3 m	3-4.5 m	4.5-6 m	6-7.5 m	7.5-9 m	>9 m	unknown	bank prot. (%)	bank scour (%)	bed scour (%)	no impact (%)
S.P.-L.C.	69	14	12	5	0	0	0	7	1	15	77
R.B.-deD.	32	39	23	3	3	0	0	6	0	33	58
deD.-S.C.	29	6	12		6	47	0	0	0	71	29
B.-G.S.	57	18	7	7	0	11	0	11	0	25	64
G.S.-G.P.	26	21	44	3	3	6	0	6	6	32	65
G.P.-N.	61	26	17	0	2	0	0	18	9	20	53
N.-S.	57	13	13	8	6	3	0	5	0	28	67
S.-R.	50	23	27	0	0	0	0	0	9	36	55
R.-U.S.	71	5	14	10	0	5	0	13	0	38	58
U.S.-D.S.	55	25	10	10	0	0	0	10	0	35	65
D.S.-Q	64	2	18	8	0	8	0	14	0	41	45
Q.-V.M.	40	14	14	7	5	21	0	40	0	26	40
V.M.-R.C.	28	25	6	6	6	22	6	12	0	9	78
R.C.-L.	0	10	29	14	14	33	0	29	24	38	9
Wt. Mean	49	17	17	6	3	9	0	13	3	29	57

1. Sums of individual reach percent and weighted mean percents of “Physical function” may exceed 100% because many pieces of LWD served both to protect the bank and provide bed scour.

Table 3 Continued

reach	Fauna present (% of total with fauna)						Environment (% of total in specific hydraulic habitat)					
	crayfish	steelhead	other fish	frog	turtle	none	rifle (%)	run (%)	pool (%)	glide (%)	unknown	N/A
S.P.-L.C.	5	5	5	0	0	85	57	14	18	8	0	0
R.B.-deD.	3	10	29	3	0	71	32	48	19	0	0	0
deD.-S.C.	41	7	59	6	6	41	12	53	29	0	0	0
B.-G.S.	11	32	54	0	0	43	11	32	15	43	0	0
G.S.-G.P.	18	47	65	6	0	38	9	50	38	3	0	0
G.P.-N.	28	24	17	2	2	27	37	32	14	17	0	0
N.-S.	44	3	23	5	0	46	18	33	31	13	3	0
S.-R.	18	27	36	14	5	54	18	55	18	9	0	0
R.-U.S.	67	83	83	37	0	17	25	42	18	18	0	0
U.S.-D.S.	0	25	45	20	0	50	15	70	15	0	0	0
D.S.-Q	10	80	80	0	0	20	12	51	31	0	0	0
Q.-V.M.	0	63	84	0	0	16	7	58	30	5	0	0
V.M.-R.C.	0	0	0	0	0	100	0	100	0	0	0	0
R.C.-L.	0	0	0	0	0	100	0	100	0	0	0	0
Wt. Mean	16	30	40	5	1	50	21	48	21	8	0	0

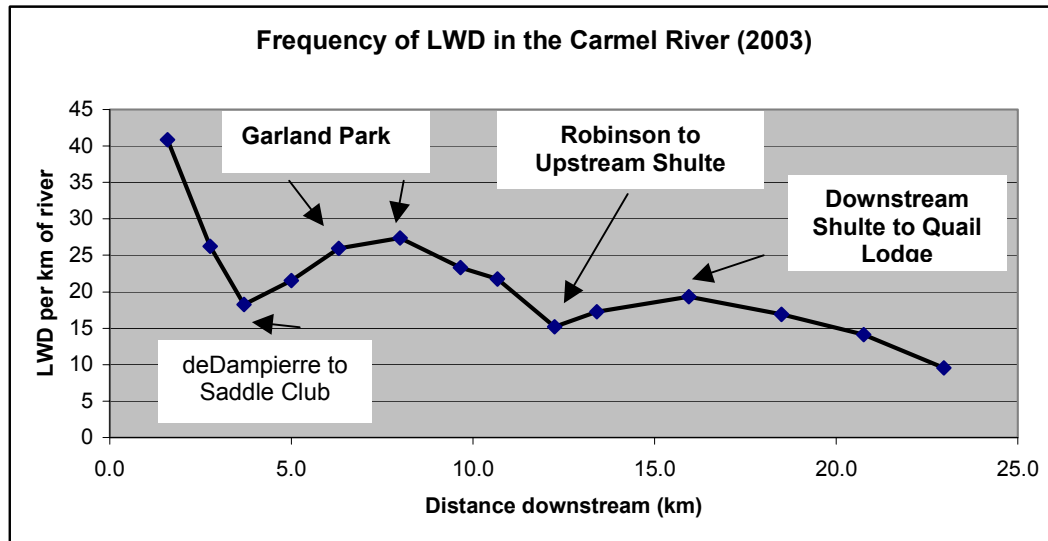
Table 3 Continued

reach	Part of channel (% of total in specific channel region)				Mobility (% of total with specific mobility)		
	center	low flow edge	bankfull edge	floodplain	highly	peak flows	well-embedded
S.P.-L.C.	4	61	35	0	11	9	80
R.B.-deD.	10	39	51	0	19	6	75
deD.-S.C.	0	71	24	0	12	47	41
B.-G.S.	7	46	43	4	7	0	93
G.S.-G.P.	3	53	44	3	12	6	82
G.P.-N.	2	63	35	0	9	0	91
N.-S.	13	61	26	0	15	0	85
S.-R.	5	45	45	5	5	5	90
R.-U.S.	14	14	67	0	14	0	86
U.S.-D.S.	5	80	5	10	5	5	90
D.S.-Q	0	84	14	2	8	35	57
Q.-V.M.	0	79	16	5	12	7	81
V.M.-R.C.	16	28	44	12	9	34	56
R.C.-L.	0	67	33	0	5	38	57
	5	58	33	3	11	12	77

Approximately 470 instances of single or multiple LWD occurrences were recorded within the 23 km (14 mi.) of surveyed river. Most pieces were between 15 cm and 45 cm in diameter and between 1.5 m and 6 m long (Table 3). The average density of LWD in the surveyed river is 21 occurrences per km (37 occurrences/km).

The density of LWD (occurrences per km) decreases downstream at a rate of 0.8 occurrences/km, and shows an interesting pattern that may be linked to land-use (Fig. 3).

Figure 3: Density of LWD with distance downstream from Stonepine Bridge.



Garland Park has a relatively high concentration of LWD—26 pieces LWD/km (Figs. 3 and 4). The frequency and complexity of LWD and hydraulic habitat in the Garland Stables to Garland Park reach make this section of river a reference reach in terms of overall apparent habitat diversity. The poorest concentration of LWD was between Robinson Bridge and Upstream Schulte (Fig. 5). This reach is below the Carmel Valley Ranch Golf Course where recruitment would be low because of riparian tree management. Other reaches with low concentrations include the stream-side golf courses, such as Rancho Cañada Golf Course (Fig. 6).

Figure 4: LWD along Garland Park.

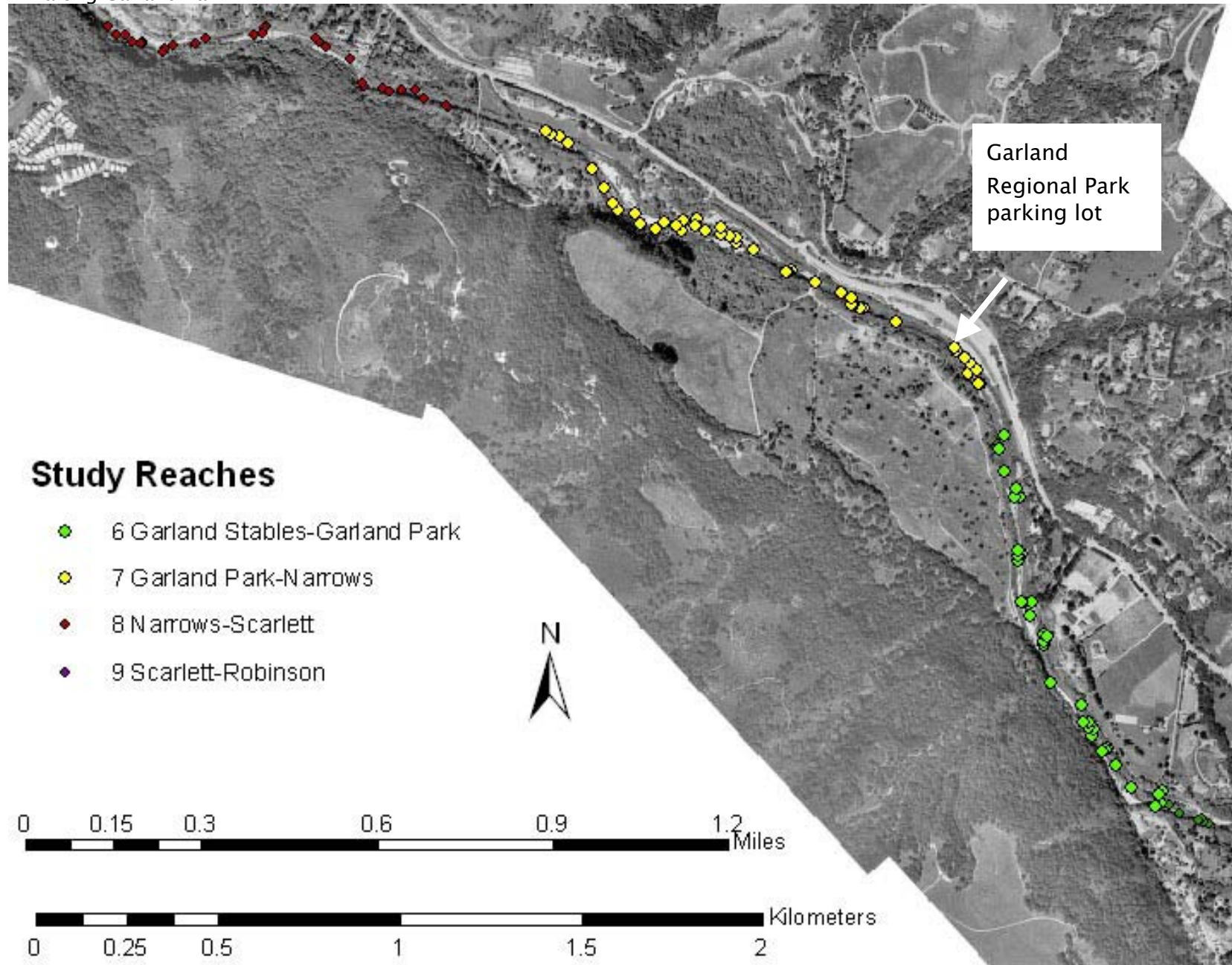


Figure 5: Low concentration of LWD downstream from Robinson Canyon.

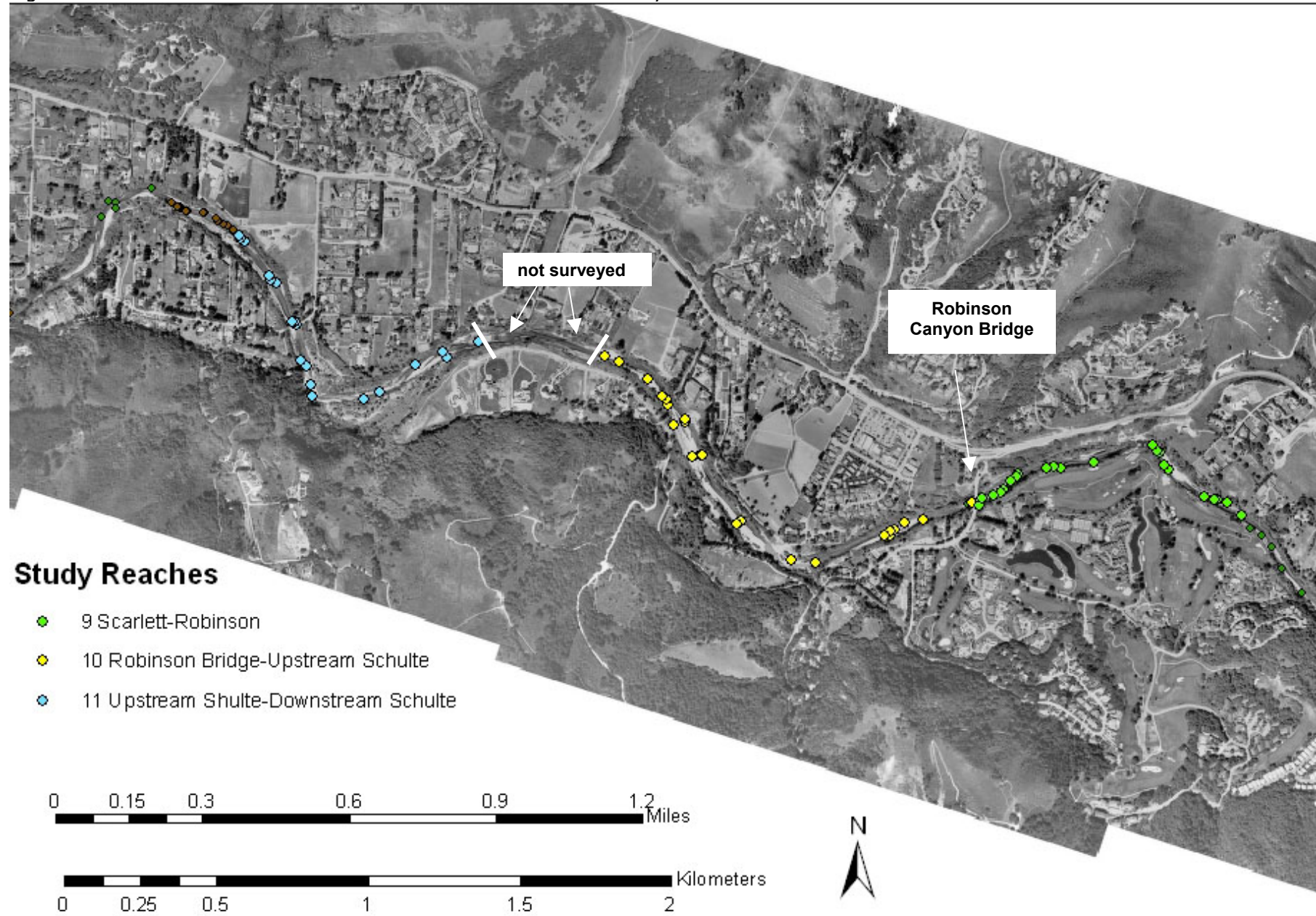
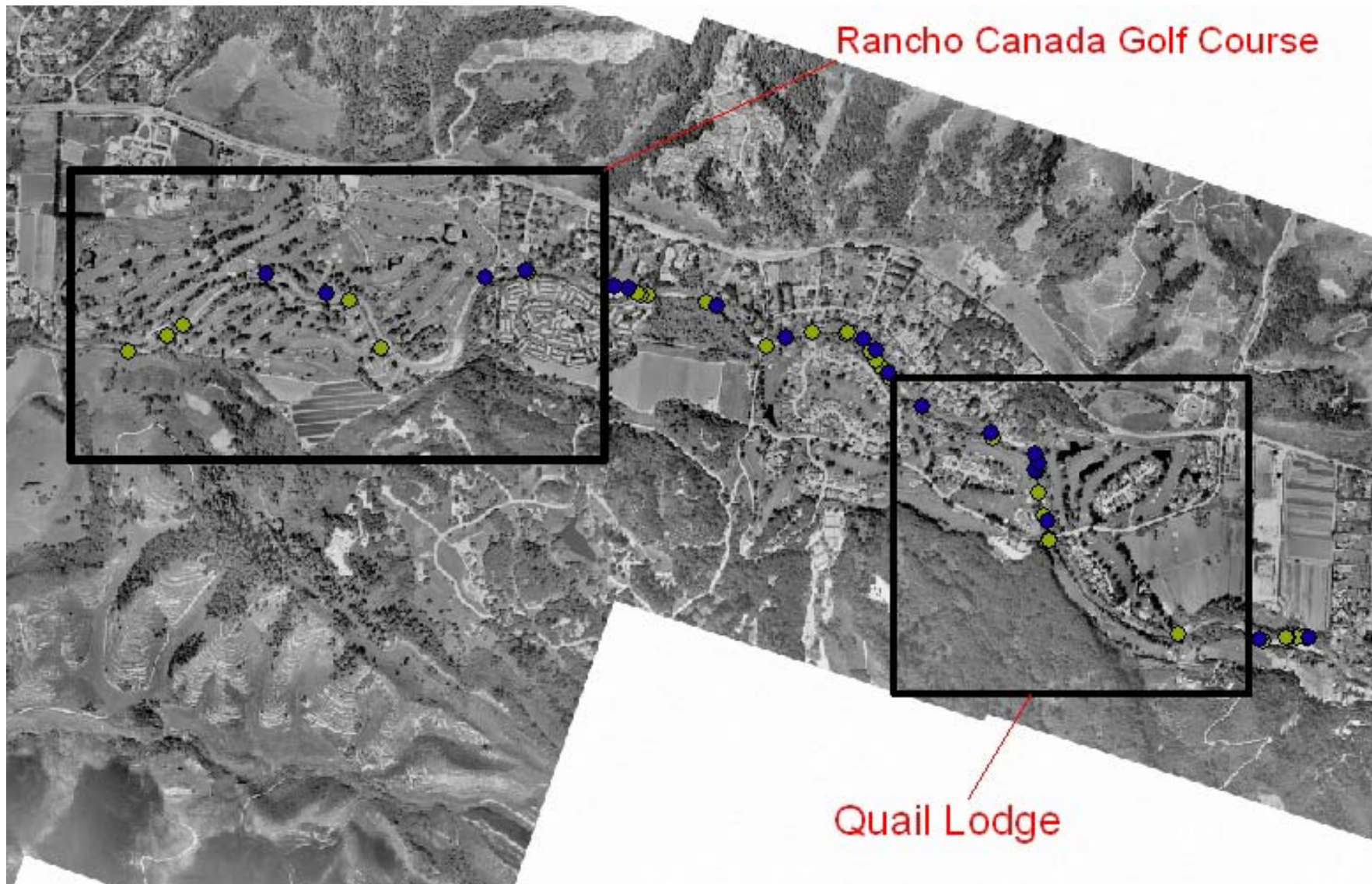


Figure 6: Low LWD concentrations along two golf courses.



To see how average conditions change from upstream to downstream on the river, we divided the study site roughly into thirds (Fig 7).

Figure 7: Reach A,B,C definitions for following figures

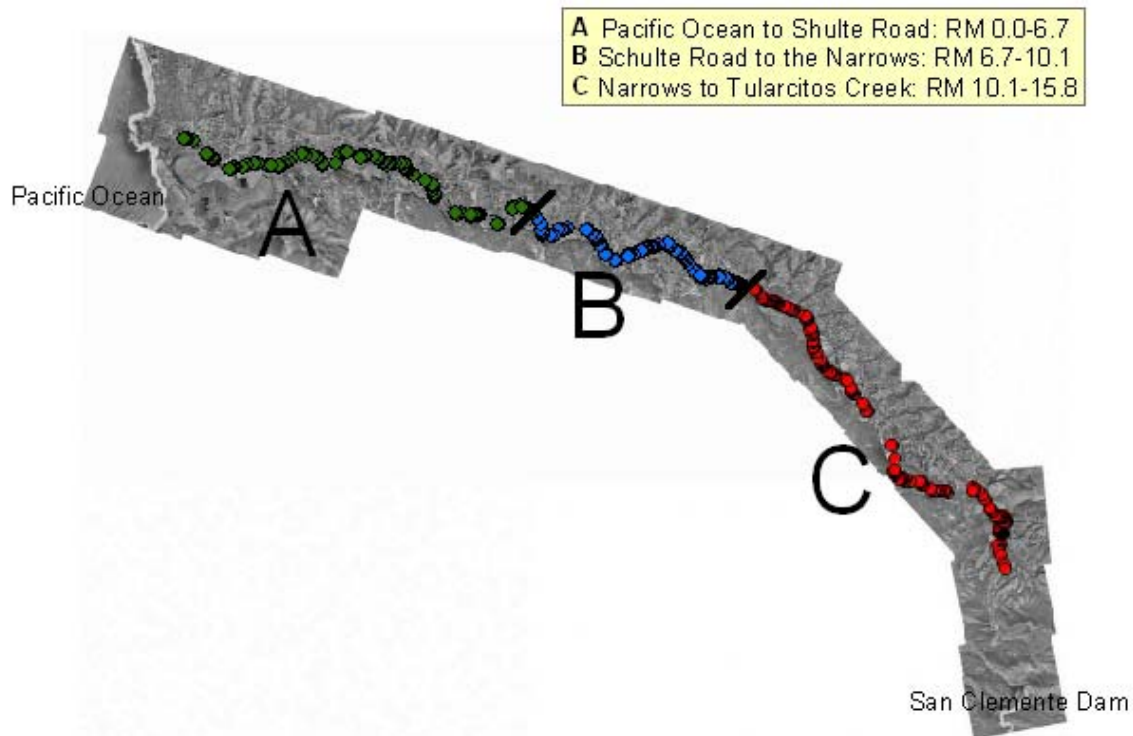


Figure 8 shows that upstream sites have a higher proportion of LWD accumulations that gradually disintegrate into single pieces of LWD downstream. Likewise single pieces with associated with rootballs appear to lose their rootballs as they move downstream. These inferences can be tested as future studies track the tagged wood as it moves downstream.

We assessed the apparent mobility of each LWD occurrence by noting the kind of event that would initiate movement (Appendices A and C). The mobility did not change much along the river (Fig. 9) except for the lowest reach where the wood appeared to have a more stable geometry and larger pieces on average.

Thirty-five pieces of LWD (7%) in the survey were placed for river management purposes. We have been visually monitoring five large redwood logs placed near the deDampierre baseball park (Fig. 10). The logs were placed, angled upstream, to maintain a deep efficient channel and provide pool habitat. This reach has historically been the location of high sediment load that periodically fills and destabilizes the channel. Since installation of the log structures (2002)

there have been several minor flood flows. The installations are structurally sound and are providing significant pool habitat through forced hydraulic scour. The channel has developed and maintained a relatively low width/depth geometry as planned. This geometry provides a large hydraulic radius that is best for transporting sediment that might otherwise cause instability.

Figure 8: LWD type variation along the Carmel River. See Figure 7 for reference.

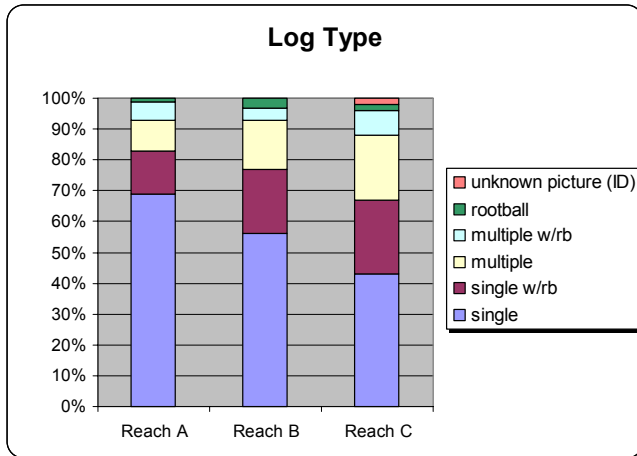


Figure 9: LWD Mobility along the Carmel River. See Figure 7 for reference.

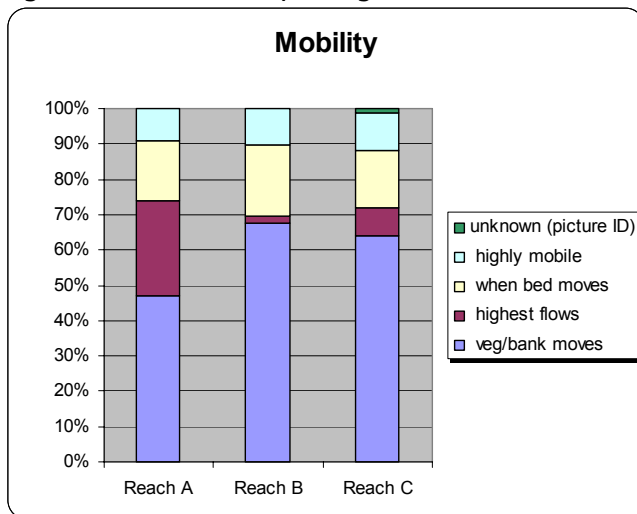
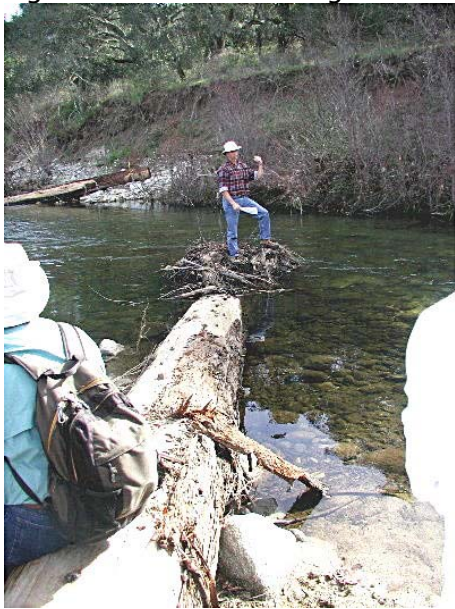
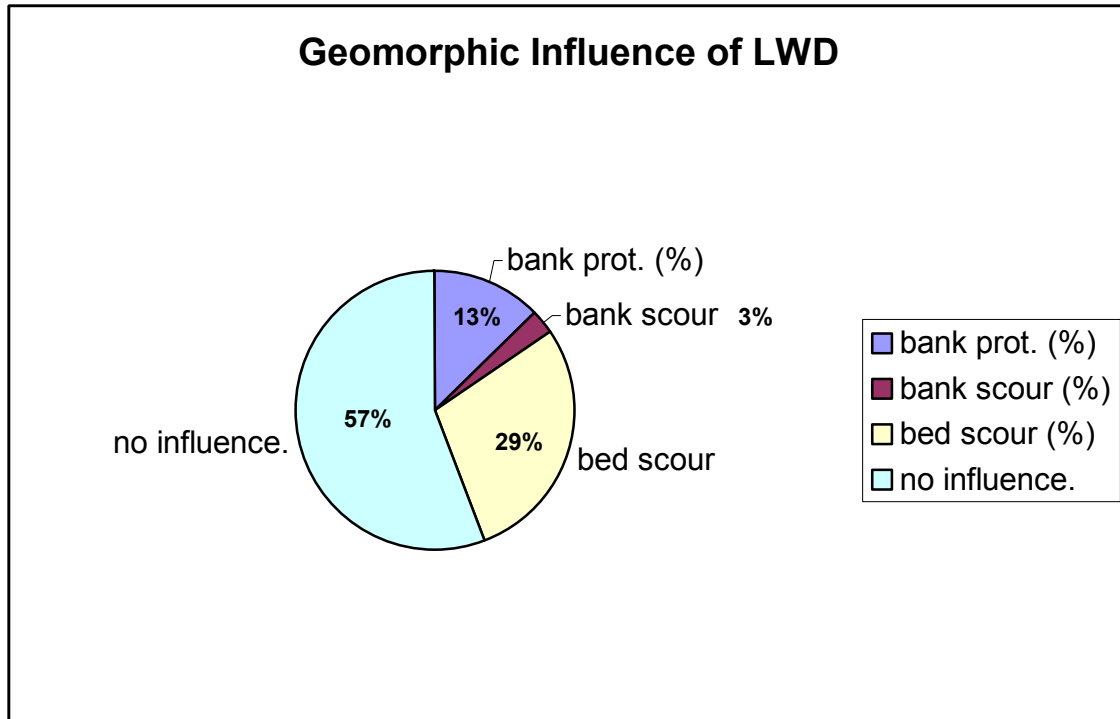


Figure 10: One of five large redwood logs placed near deDampierre ballpark. View upstream.



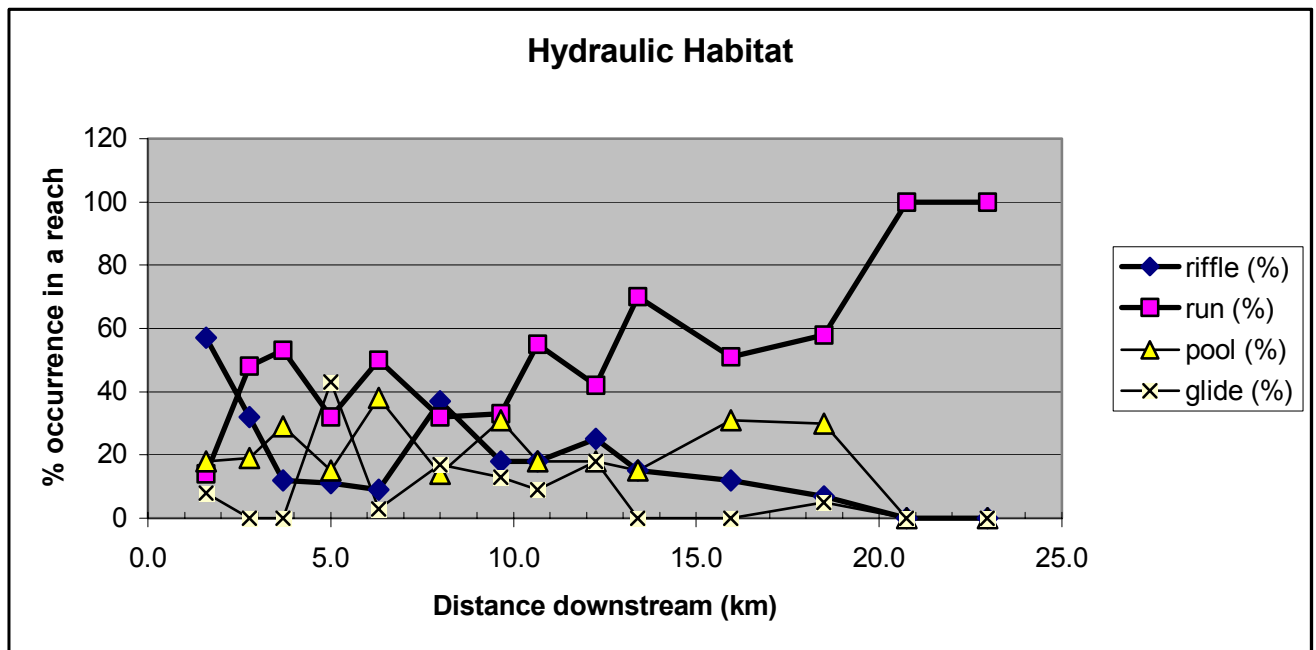
Of the approximately 470 occurrences of LWD, 57% appeared to have no morphological impact on the bank or bed (Fig. 11). 42% of the LWD pieces were providing benefits to the morphology by either providing bed scour for pool habitat or armoring the bank from erosion. Only 3% were inducing bank scour. The majority of LWD providing bank protection was oriented parallel to the flow or pointing downstream, in roughly equal amounts. In general, the overall data set indicates, that wood naturally accumulates parallel to the bank or with the stem pointing downstream (Appendix C). There is no clear relationship between the positive or negative influence on the bank and LWD orientation or angle from the bank (Appendix C). Of the 17 occurrences of LWD that were clearly causing bank scour, 9 (47 %) were multiple piece accumulations. Of the remaining 8 occurrences, half were oriented parallel to flow and half were oriented downstream, which is the same orientation as wood that was protecting the banks.

Figure 11: Geomorphic influence of LWD.



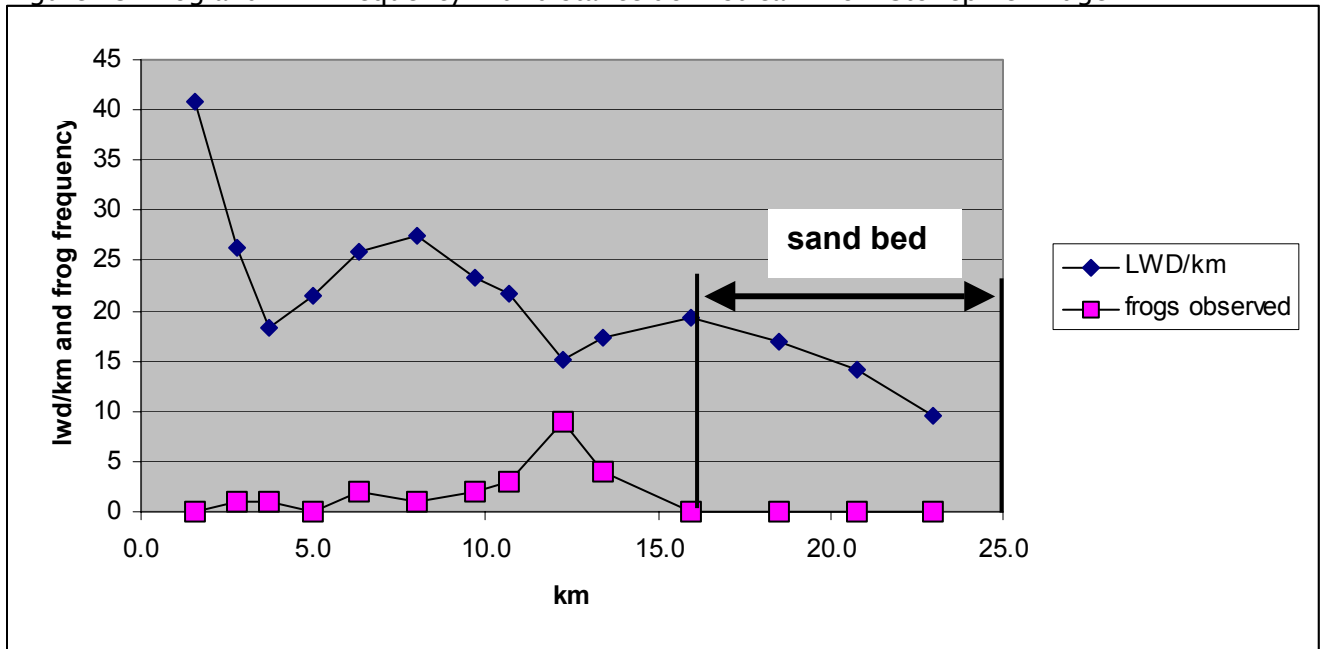
Riffle habitat becomes less prevalent downstream as cobble and gravel substrates give way to sand. Run habitat takes the place of riffle in the river, especially after sand becomes the dominant substrate at 16 km (Fig. 12). The proportion of pools remains relatively constant.

Figure 12: Changes in river hydraulic habitat with distance downstream from Stonepine Bridge.



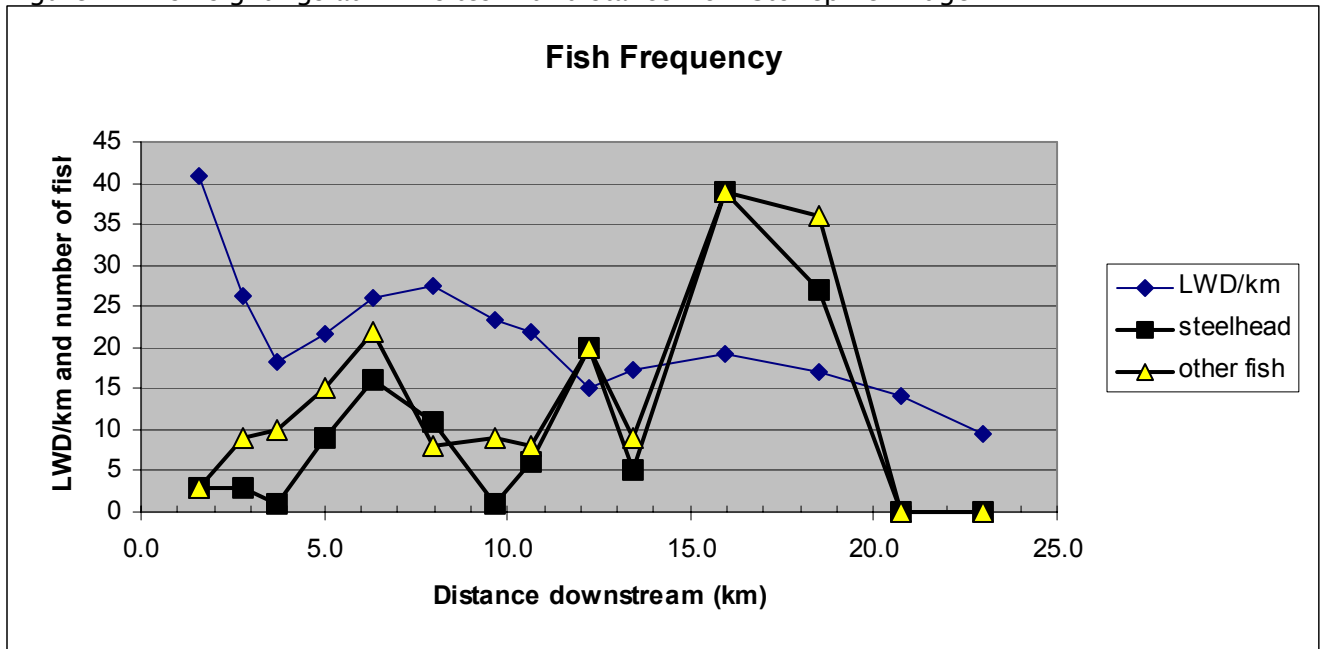
Fauna were noted on first approach to each LWD site (Appendix A). These biological data provide only anecdotal evidence of how the LWD is being used. The percentage of LWD bearing frogs increases markedly where there is a sudden decrease in available logs, suggesting that the population may be impacted by the paucity of LWD in that reach of the river (Fig. 13); however we note that there is not a similar increase in frog sightings where LWD decreases at 3.5 kilometers along the river. The sudden drop in frog sightings at a position of 16 km corresponds to the point at which the bed of the Carmel River turns to sand. The number of crayfish also plummets at 16 km. The lower two reaches of river were dry, eliminating the chance of finding aquatic fauna

Figure 13: Frog and LWD frequency with distance downstream from Stonepine Bridge.



Fish, including juvenile steelhead and stickleback, were commonly seen near LWD, attesting to the biological importance of the resource (Fig. 14).

Figure 14: Fish sightings at LWD sites with distance from Stonepine Bridge.



5 Discussion

As is true in the Aptos watershed (Conrad, 2003), we note that streamside urbanization and development tend to reduce the density of LWD in the stream. This relationship may reflect a lower number of local recruitable trees or a tendency for landowners to periodically clear their reach of stream. During our survey we noted several occurrences of landowners cutting LWD to increase its mobility.

According to Fox (2004) unmanaged watersheds in Washington have a wide range of LWD densities. Based upon their data, a stream with 21 pieces per km (average Carmel River density) has half as much LWD as the minimum acceptable amount for salmonid-bearing streams. We do not suggest that the Washington data be directly used as an index of LWD density in the Carmel River, but we could find no other references for west coast streams.

Although it is clear that more LWD was present in the 2003 survey than in the pilot study of 2002, a rigorous comparison of 2002 LWD (Smith et al., 2003) and the present 2003 LWD density is not advisable owing to possible differences in observer skills between the two surveys.

6 GIS Project

Accompanying this report is an ArcMap 8.2 GIS project and electronic dataset. The electronic data associated with this study include the following data.

Data	Files	FileType	Report element
this report	1	doc/pdf	all
photographs of LWD	93	jpg	
list of photographed sites	1	xls	
list of tagged wood	1	xls	
LWD data by reach	15	xls	App C & D
summary statistics	1	xls	Tables 2 & 3
LWD sites located without GPS	1	xls	

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8 Appendix A: Carmel River LWD Data Sheet Instructions

2/11/03

In the excel file, there are three tabs of data sheets. One for single pieces, one for multiple pieces, and one for rootballs only. This was done because there are some different questions for each type and they would not fit on one page.

General location: a reach name usually describing the ends of the reach traversed in the particular survey day. It includes an estimate of the river mile, perhaps a cross-street or a bridge as a reference.

Site: at the top of each column in the gray bar we entered, Pt. 1 (GPS) and the time on the GPS unit so that we could identify the points later in the lab.

Type of Reach: P / RN / G / RI

P = pool, RN = run, G = glide, RI = riffle

We recorded both the current type and projected with 2 feet of water. As suggested by MPWMD, the projected reach type was estimated by imagining the environment at 200 cfs, about 2 feet higher than base flow.

Estimated reach length (m): except for the small features, which we measured, this was normally estimated by eye.

Part of channel: LB/RB

LB = left bank, RB = right bank (looking down river)

Type of substrate: S / G / C / B / BR

S = sand, G = gravel, C = cobble, B = boulders, BR = bedrock

Concentrating on the area around the log, not the whole reach, which was sometimes different.

Width (cm): this width is the diameter in range category, 15 cm being the smallest possible width. The width categories were divided into 15 cm bins, 15–30, 30–45, 45–60, 60–75, etc. For multiple pieces, a width range that applied to most of the pieces present was estimated. Where rootballs were the only feature, the LWD is typically equant, and a two dimensional result was recorded (2 m x 2 m), for example. Since there were no logs attached to them, log length was not measured.

Length (m): Also in ranges, 1.5 m each, with 1.5 m being the shortest possible, 1.5–3, 3–4.5, 4.5–6, 6–7.5, etc.

For multiple pieces, a length range that applied to most of the pieces present was estimated.

Size of entire structure (m): Only applies to multiple log sites. For example, estimated 10 x 6m. The true size of some accumulations was stunning.

pieces greater 15cm diameter: Only applies to multiple log sites. If it was few enough to count, we counted them. Most importantly we noted accumulation or jam status here.

Accumulation \leq 10 logs touching

Jam \geq 10 logs touching

Condition:

Live = green leaves (this does not include live willows whose roots were still in the bank, only log fragments that appeared to be sprouting in their new locations)

Little or no decomposition = the bark is still on, looks freshly introduced

Partially decomposed = bark missing, looks like been in the river for a while

Significantly decomposed = if we were to step on it, pieces would come off

Embedment: qualitative judgment of how well the wood was buried in the bed or bank

Mobility:

Highly mobile = we think that the wood will be carried in a low magnitude flow.

Mobile when bed moves = applied to pieces generally stuck in the center of the river

Mobile when vegetation/bank moves = if we lost the bank or bushes it would move

Mobile only on highest flows = it is too high in elevation for anything but a flood to ever move it

Orientation:

us = upstream, ds = downstream, pf = parallel to flow

Degrees off bank:

< 30 / > 30

This only applies if log is partially on the bank. Is the angle off the bank less than or greater than 30 degrees? Did not apply to multiple pieces since pieces were often pointing in every possible direction. Does not apply to rootballs.

Influence on stream morphology: put an X next to each box that you see morphology affected by the LWD.

Type of wood/species: we wrote this in by hand. Lack of bark and leaves made this usually unknown.

Fauna: put an X next to each fauna type you see. Even though fauna is at the bottom of the sheet, we were always looking for fauna upon first approach, before it was flushed by our movement.

Additional comments: anything else interesting or identifiable about the site

Note that in some cases, an entry of "N/A" in the data table indicates that the data are not applicable to the LWD occurrence, such as for the orientation of an accumulation of LWD pieces. However, in some cases, technicians used "N/A" to indicate missing data.

9 Appendix B: Sample Data Sheets

DATA SHEET: SINGLE PIECE					
Date:					
Surveyors:					
General Location:					
SITE:					
Type of reach (currently)	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI
Type of reach (projected 200 cfs)	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI
Estimated reach length (m)					
Part of Channel					
low flow bank	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
floodplain/bench	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
bankfull streambank	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
Type of Substrate:	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR
WOOD DESCRIPTION					
Rootball present	Y / N	Y / N	Y / N	Y / N	Y / N
Width (cm)					
Length (m)					
Condition					
live					
little or no decomposition					
partially decomposed					
significantly decomposed					
Embedment					
no embedment					
partial to fully in bed					
partial in vegetation/bank					
fully embedded w/veg					
Mobility Scale					
1) highly mobile					
2) mobile when bed moves					
3) mobile when veg/bank moves					
4) mobile only on highest flows					
Orientation	us / ds / pf	us / ds / pf	us / ds / pf	us / ds / pf	us / ds / pf
Degrees off bank	< 30 / > 30	< 30 / > 30	< 30 / > 30	< 30 / > 30	< 30 / > 30
Influence on stream morphology					
none detected					
scour hole in bed					
scour along bank					
protecting bank					
Type of wood/species: Oak/					
Buckeye/Cottonwood/Alder/Pine/					
Sycamore/Willow/Mix/Unknown					
Fauna: cf/bf/sh/wpt/rif/htch/stk/					
Crayfish					
Bullfrog					

Steelhead					
Western pond turtle					
Red legged frog					
Hitch, Stickleback					
None detected					
Other					
Additional Comments:					

DATA SHEET: MULTIPLE PIECES					
Date:					
Surveyors:					
General Location:					
SITE:					
Type of reach (currently)	P / R N / G / R I	P / R N / G / R I	P / R N / G / R I	P / R N / G / R I	P / R N / G / R I
Type of reach (projected 200 cfs)	P / R N / G / R I	P / R N / G / R I	P / R N / G / R I	P / R N / G / R I	P / R N / G / R I
Estimated reach length (m)					
Part of Channel					
low flow bank	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
floodplain/bench	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
bankfull streambank	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
Type of Substrate:	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR
WOOD DESCRIPTION					
Rootballs present	Y / N	Y / N	Y / N	Y / N	Y / N
Avg width of pieces (cm)					
Avg length of pieces (m)					
Size of entire structure (m)					
# pieces > 15 cm wide					
Condition					
live					
little or no decomposition					
partially decomposed					
significantly decomposed					
Embedment					
no embedment					
partial to fully in bed					
partial in vegetation/bank					
fully embedded w/veg					
Mobility Scale					
1) highly mobile					
2) mobile when bed moves					
3) mobile when veg/bank moves					
4) mobile only on highest flows					
Influence on stream morphology					
none detected					

scour hole in bed					
scour along bank					
protecting bank					
Type of wood/species: Oak/					
Buckeye/Cottonwood/Alder/Pine/					
Sycamore/Willow/Mix/Unknown					
Fauna: cf/bf/sh/wpt/rif/htch/stk/					
Crayfish					
Bullfrog					
Steelhead					
Western pond turtle					
Red legged frog					
Hitch, Stickleback					
None detected					
Other					
Additional Comments:					

DATA SHEET: ROOTBALL ONLY					
Date:					
Surveyors:					
General Location:					
SITE:					
Type of reach (currently)	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI
Type of reach (projected 200 cfs)	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI	P / RN / G / RI
Estimated reach length (m)					
Part of Channel					
low flow bank	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
floodplain/bench	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
bankfull streambank	LB / RB	LB / RB	LB / RB	LB / RB	LB / RB
Type of Substrate:	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR	S / G / C / B / BR
WOOD DESCRIPTION					
Width / Length (m)					
Condition					
live					
little or no decomposition					
partially decomposed					
significantly decomposed					
Embedment					
no embedment					
partial to fully in bed					
partial in vegetation/bank					
fully embedded w/veg					
Mobility Scale					
1) highly mobile					
2) mobile when bed moves					
3) mobile when veg/bank moves					
4) mobile only on highest flows					

Influence on stream morphology					
none detected					
scour hole in bed					
scour along bank					
protecting bank					
Type of wood/species: Oak/					
Buckeye/Cottonwood/Alder/Pine/					
Sycamore/Willow/Mix/Unknown					
Fauna: cf/bf/sh/wpt/rlf/htch/stk/					
Crayfish					
Bullfrog					
Steelhead					
Western pond turtle					
Red legged frog					
Hitch, Stickleback					
None detected					
Other					
Additional Comments:					

10 Appendix C: 2002–2003 LWD Data (Stonepine to Via Mallorca)

Stonepine to Sleepy Hollow Reach of the Carmel River							September 9, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	# PIECES	MOBILITY	INFLUENCE	CONDITION
1	see image	see image	see image	see image	see image	see image	see image
2	see image	see image	see image	see image	see image	see image	see image
3	single w/rb	45	4	NA	veg/bank moves	none detected	part decomp
4	single	45-60	10	NA	when bed moves	none detected	little/no decomp
5	multiple	15	2	>10	veg/bank moves	none detected	part decomp
6	single	60	4	NA	veg/bank moves	none detected	part decomp
7	multiple	15	2	>10	veg/bank moves	bank scour	part decomp
8	multiple	15	1	4	veg/bank moves	none detected	part decomp
9	multiple w/rb	15	2	>10	veg/bank moves	none detected	part decomp
10	multiple	15	2	>10	veg/bank moves	none detected	part decomp

Stonepine to Sleepy Hollow Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	see image	see image	see image	see image	see image	see image	see image
2	see image	see image	see image	see image	see image	see image	RB bankfull bank
3	part veg/bank	pf	NA	riffle	riffle	100	LB low flow bank
4	no embed	perp	90	riffle	riffle	100	central low flow
5	part veg/bank	NA	NA	riffle	riffle	100	LB bankfull bank
6	part veg/bank	pf	NA	riffle	riffle	100	RB low flow bank
7	part veg/bank	NA	NA	pool	pool	50	RB bankfull bank
8	part veg/bank	NA	NA	riffle	riffle	100	RB bankfull bank
9	part veg/bank	NA	NA	pool	pool	75	central low flow
10	part veg/bank	NA	NA	riffle	riffle	50	RB bankfull bank

Stonepine to Sleepy Hollow Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	see image	unknown	wstrn pnd trtle	3-4 pieces in pic	NA	yes	
2	see image	unknown	none detected	multiple accum.	unknown	yes	
3	cobble	unknown	none detected		NA	yes	
4	cobble	willow	none detected		NA	yes	
5	cobble	unknown	none detected		6 x 2 x 3	yes	
6	boulder	unknown	none detected		NA	yes	
7	cobble	unknown	none detected		10 x 3 x 3	yes	
8	cobble	unknown	Stcklbk		5 x 2 x 1	yes	
9	cobble	unknown	Stcklbk/Cryfish		10 x 4 x 1	no	
10	cobble	unknown	none detected		20 x 10 x 1	yes	

Stonepine to Lower Circle Reach of the Carmel River							October 7, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	# PIECES	MOBILITY	INFLUENCE	CONDITION
1	single	15	2	NA	when bed moves	none detected	part decomp

2	single	15	3	NA	highly mobile	none detected	part decomp
3	single	15	4	NA	when bed moves	none detected	part decomp
4	single w/rb	30-45	2	NA	when bed moves	bed scour	part decomp
5	single	15-	4	NA	highly mobile	none detected	signif decomp
6	single w/rb	45	1.5	NA	when bed moves	bed scour	signif decomp
7	multiple w/rb	15-30	2	>10	veg/bank moves	none detected	part decomp
8	multiple	45	3	4	veg/bank moves	none detected	part decomp
9	single	15-30	5	NA	veg/bank moves	none detected	little/no decomp
10	multiple	30	2.5	3	veg/bank moves	none detected	part decomp
11	multiple	15	3	3	veg/bank moves	none detected	part decomp
12	multiple	30	2	5	veg/bank moves	none detected	part decomp
13	multiple	30	3	>10	highest flows	bed scour	part decomp
14	multiple w/rb	30	3	>10	highest flows	bank scour	part decomp
15	multiple w/rb	30	3	7	veg/bank moves	bed scour	live
16	multiple	15-30	3	4	veg/bank moves	none detected	little/no decomp
17	single	15-45	5	NA	veg/bank moves	none detected	live
18	single w/rb	15-30	4	NA	veg/bank moves	none detected	part decomp
19	multiple w/rb	30-45	3	5	highest flows	none detected	part decomp
20	multiple	15	2	3	veg/bank moves	none detected	part decomp
21	single	15-30	5	NA	when bed moves	none detected	part decomp
22	multiple	15	1.5	3	veg/bank moves	none detected	part decomp
23	multiple w/rb	15-30	1.5	4	veg/bank moves	none detected	part decomp
24	multiple w/rb	15-30	1.5	>10	veg/bank moves	none detected	part decomp
25	single	15	2	NA	veg/bank moves	none detected	part decomp
26	single	15	2.5	NA	highly mobile	bed scour	signif decomp
27	rootball	2 (m)	2	NA	when bed moves	bed scour	part decomp
28	multiple	15	4	3	veg/bank moves	bed scour	part decomp
29	single	15-30	4	NA	when bed moves	none detected	part decomp
30	multiple w/rb	15-30	3	unknown	veg/bank moves	bed scour	part decomp
31	multiple	15-30	3	unknown	veg/bank moves	bed scour	part decomp
32	single w/rb	15	3	unknown	veg/bank moves	none detected	part decomp
33	single w/rb	15-30	4	unknown	veg/bank moves	protecting bank	part decomp
34	single	15-30	7	NA	veg/bank moves	none detected	part decomp
35	single w/rb	15-30	4	NA	highly mobile	none detected	part decomp
36	single	15	3	NA	veg/bank moves	none detected	part decomp
37	single	15-30	4	NA	veg/bank moves	none detected	part decomp
38	single	30-45	2	NA	veg/bank moves	none detected	part decomp
39	single	15-30	7	NA	veg/bank moves	none detected	part decomp
40	single	15	3	NA	veg/bank moves	none detected	part decomp
41	single w/rb	15	2	NA	when bed moves	protecting bank	part decomp
42	multiple	15	2	unknown	veg/bank moves	none detected	part decomp
43	single	15	2	NA	veg/bank moves	protecting bank	signif decomp
44	single w/rb	15-45	5	NA	highest flows	none detected	part decomp
45	single	15	3	NA	veg/bank moves	none detected	part decomp
46	multiple	15	5	unknown	veg/bank moves	none detected	part decomp
47	single w/rb	15-30	5	unknown	veg/bank moves	none detected	little/no decomp
48	single	15	3	unknown	highly mobile	none detected	part decomp
49	single w/rb	45	6	NA	highest flows	none detected	part decomp
50	single	30	2	NA	highly mobile	none detected	signif decomp

51	single	45	3	NA	veg/bank moves	none detected	part decomp
52	single	15	5	NA	veg/bank moves	none detected	part decomp
53	single	45-60	2.5	NA	veg/bank moves	none detected	part decomp
54	single	30-45	3	NA	veg/bank moves	none detected	part decomp
55	single w/rb	15-	2	NA	veg/bank moves	none detected	part decomp
56	single w/rb	15	4	NA	when bed moves	bed scour	part decomp
57	single	15	3	NA	when bed moves	none detected	part decomp
58	single w/rb	45	7	NA	highest flows	none detected	part decomp
59	multiple	15	2	unknown	veg/bank moves	none detected	part decomp
60	multiple	15	3	>10	when bed moves	none detected	part decomp
61	multiple	15	3	>10	veg/bank moves	bed scour	unknown
62	multiple	15	2	5	veg/bank moves	none detected	part decomp
63	multiple	15	1.5	4	highly mobile	none detected	part decomp
64	single	30	3	NA	highly mobile	none detected	part decomp
65	multiple	15-30	2	>10	veg/bank moves	none detected	part decomp

Stonepine to Lower Circle Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	no embed	pf	NA	riffle	riffle	25	RB low flow bank
2	no embed	perp	90	riffle	riffle	25	RB low flow bank
3	no embed	perp	90	riffle	riffle	25	RB bankfull bank
4	part/full bed	pf	NA	riffle	riffle	25	central low flow
5	no embed	pf	NA	riffle	riffle	25	RB low flow bank
6	part/full bed	pf	NA	riffle	riffle	25	LB low flow bank
7	part veg/bank	NA	NA	riffle	riffle	25	RB bankfull bank
8	part veg/bank	NA	NA	riffle	riffle	25	RB bankfull bank
9	part/full bed	pf	NA	riffle	riffle	25	LB low flow bank
10	part/full bed	NA	NA	riffle	riffle	15	central low flow
11	part veg/bank	NA	NA	riffle	riffle	15	RB bankfull bank
12	part veg/bank	NA	NA	riffle	riffle	15	RB bankfull bank
13	part veg/bank	NA	NA	riffle	riffle	25	RB bankfull bank
14	part veg/bank	NA	NA	riffle	riffle	25	LB bankfull bank
15	part veg/bank	NA	NA	riffle	riffle	25	LB bankfull bank
16	part veg/bank	NA	NA	riffle	riffle	25	RB low flow bank
17	part veg/bank	ds	<30	glide	glide	10	LB low flow bank
18	part veg/bank	ds	<30	glide	glide	10	LB low flow bank
19	part veg/bank	NA	NA	riffle	riffle	25	RB bankfull bank
20	part veg/bank	NA	NA	run	run	75	RB low flow bank
21	no embed	ds	unknown	run	run	50	LB low flow bank
22	part veg/bank	NA	NA	run	riffle	75	LB bankfull bank
23	part veg/bank	NA	NA	pool	pool	100	RB bankfull bank
24	part veg/bank	NA	NA	pool	pool	100	LB low flow bank
25	part veg/bank	ds	<30	pool	pool	100	RB low flow bank
26	no embed	pf	NA	pool	pool	100	RB low flow bank
27	part/full bed	NA	NA	pool	pool	100	RB low flow bank
28	part veg/bank	NA	NA	riffle	riffle	25	RB low flow bank
29	part/full bed	perp	90	riffle	riffle	25	central low flow
30	part veg/bank	NA	NA	glide	glide	20	RB low flow bank

31	part veg/bank	NA	NA	glide	glide	20	LB bankfull bank
32	part veg/bank	us	>30	riffle	riffle	10	RB low flow bank
33	part veg/bank	ds	<30	run	run	30	LB low flow bank
34	part veg/bank	pf	NA	riffle	riffle	25	LB low flow bank
35	no embed	pf	NA	riffle	riffle	25	LB low flow bank
36	part veg/bank	ds	<30	pool	pool	100	RB low flow bank
37	part veg/bank	ds	<30	pool	pool	100	RB low flow bank
38	part veg/bank	ds	<30	pool	pool	100	LB low flow bank
39	part veg/bank	ds	<30	pool	pool	100	LB low flow bank
40	part veg/bank	pf	NA	pool	pool	100	RB low flow bank
41	part veg/bank	pf	NA	riffle	riffle	50	RB low flow bank
42	part veg/bank	NA	NA	riffle	riffle	50	LB low flow bank
43	part veg/bank	pf	NA	riffle	riffle	50	RB low flow bank
44	part veg/bank	pf	NA	riffle	riffle	50	RB bankfull bank
45	part veg/bank	unknown	unknown	riffle	riffle	15	LB bankfull bank
46	part veg/bank	NA	NA	run	run	25	LB bankfull bank
47	part veg/bank	unknown	unknown	riffle	riffle	15	RB bankfull bank
48	no embed	unknown	unknown	riffle	riffle	15	LB low flow bank
49	part veg/bank	unknown	unknown	glide	glide	10	LB bankfull bank
50	no embed	unknown	unknown	riffle	riffle	15	RB low flow bank
51	part veg/bank	unknown	unknown	run	run	50	LB low flow bank
52	part veg/bank	ds	30	riffle	riffle	50	LB low flow bank
53	no embed	pf	unknown	riffle	riffle	200	LB bankfull bank
54	no embed	perp	unknown	run	run	200	RB low flow bank
55	part veg/bank	pf	unknown	run	run	200	LB low flow bank
56	part veg/bank	pf	NA	run	run	200	RB low flow bank
57	part veg/bank	ds	30	pool	pool	100	LB low flow bank
58	part veg/bank	us	30	pool	pool	100	RB bankfull bank
59	part veg/bank	NA	NA	riffle	riffle	50	RB bankfull bank
60	no embed	NA	NA	riffle	riffle	50	RB bankfull bank
61	part veg/bank	NA	NA	riffle	riffle	50	RB bankfull bank
62	part veg/bank	NA	NA	pool	pool	50	RB bankfull bank
63	part veg/bank	NA	NA	riffle	riffle	50	LB low flow bank
64	no embed	NA	NA	riffle	riffle	50	RB low flow bank
65	part veg/bank	NA	NA	riffle	riffle	50	RB bankfull bank

Stonepine to Lower Circle Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	boulder	unknown	none detected		NA	no	
2	boulder	unknown	none detected		NA	no	
3	cobble	unknown	none detected		NA	no	
4	cobble	oak	none detected		NA	no	
5	cobble	unknown	none detected		NA	no	
6	cobble	unknown	none detected		NA	no	
7	cobble	unknown	none detected		8 x 5 x 2	yes	
8	cobble	unknown	none detected		4 x 4 x 1	no	
9	cobble	unknown	none detected		NA	yes	
10	cobble	unknown	none detected		2 x 3 x 1	no	

11	cobble	unknown	none detected		5 x 3 x 1	no	
12	cobble	unknown	none detected		2 x 5 x 2	no	
13	cobble	unknown	none detected		8 x 6 x 2	yes	
14	gravel	unknown	none detected		4 x 6 x 2	no	
15	cobble	cottonwood	none detected	severe scour	5 x 5 x 2	yes	C05
16	cobble	unknown	none detected		3 x 3 x 1	no	
17	cobble	unknown	none detected		NA	yes	C03
18	cobble	unknown	none detected		NA	yes	
19	sand	unknown	none detected		4 x 5 x 3	yes	C04?
20	cobble	unknown	crayfish		3 x 2 x 1	no	
21	boulder	unknown	none detected		NA	yes	
22	boulder	unknown	none detected		4 x 4 x 2	no	
23	cobble	unknown	none detected		7 x 5 x 3	no	
24	sand	unknown	none detected		5 x 4 x 3	no	
25	cobble	unknown	Stlhd	sticking up at angle	NA	no	
26	gravel	unknown	Stlhd		NA	no	
27	cobble	unknown	Stlhd		NA	yes	C02
28	cobble	unknown	none detected		5 x 3 x 2	no	
29	cobble	unknown	none detected		NA	yes	C01
30	cobble	unknown	crayfish		6 x 3 x 3	no	
31	cobble	unknown	none detected		5 x 3 x 2	no	
32	gravel	unknown	none detected		NA	yes	
33	cobble	unknown	none detected		NA	yes	
34	cobble	unknown	none detected		NA	no	
35	cobble	unknown	none detected		NA	yes	C06
36	sand	unknown	none detected	cut at tip in chnl	NA	no	
37	sand	unknown	none detected		NA	no	
38	sand	unknown	none detected		NA	no	
39	sand	unknown	none detected		NA	no	
40	gravel	unknown	none detected		NA	no	
41	cobble	unknown	none detected		NA	no	
42	cobble	unknown	none detected		2 x 3 x 2	no	
43	cobble	unknown	none detected		NA	no	
44	cobble	unknown	none detected		NA	yes	
45	cobble	unknown	none detected		NA	no	
46	cobble	unknown	none detected		5 x 5 x 2	no	
47	cobble	willow	none detected		NA	no	
48	cobble	unknown	none detected		NA	no	
49	cobble	unknown	none detected		NA	no	
50	cobble	unknown	none detected		NA	no	
51	cobble	unknown	none detected		NA	no	
52	cobble	unknown	none detected		NA	no	
53	cobble	unknown	crayfish		NA	no	
54	sand	unknown	none detected		NA	yes	
55	cobble	unknown	Stcklbc		NA	no	
56	cobble	unknown	none detected		NA	no	
57	sand	unknown	none detected		NA	no	
58	gravel	unknown	none detected		NA	no	
59	cobble	unknown	none detected		5 x 4 x 2	no	

60	cobble	unknown	none detected		7 x 5 x 1	yes	
61	cobble	unknown	none detected		10 x 5 x 2	yes	
62	cobble	unknown	none detected		2 x 5 x 2	no	
63	cobble	unknown	none detected		2 x 3 x 2	no	
64	cobble	unknown	none detected		NA	no	
65	cobble	unknown	none detected		5 x 5 x 2	yes	

Rosie's Bridge to deDampierre Reach of the Carmel River							October 5, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	#PIECES	MOBILITY	INFLUENCE	CONDITION
1	single	15-30	4	NA	when bed moves	bed scour	part decomp
2	single	30	3	NA	when bed moves	none detected	part decomp
3	single	15-30	8	NA	veg/bank moves	none detected	little/no decomp
4	single w/rb	30-45	5	NA	veg/bank moves	none detected	part decomp
5	single	15	3	NA	highly mobile	none detected	little/no decomp
6	single w/rb	15-30	5	NA	veg/bank moves	bed scour	part decomp
7	single	45	2	NA	highly mobile	bed scour	signif decomp
8	single	15	3	NA	highly mobile	none detected	part decomp
9	single w/rb	15-30	2	NA	veg/bank moves	none detected	part decomp
10	single	15-30	5	NA	veg/bank moves	none detected	part decomp
11	rootball	2(m)	2	NA	highly mobile	none detected	part decomp
12	single w/rb	15-30	1.5	NA	highly mobile	none detected	part decomp
13	multiple w/rb	15	2	unkown	when bed moves	bed scour	part decomp
14	multiple w/rb	45	1.5	6	highest flows	unknown	part decomp
15	multiple	15	2	5	highly mobile	bank scour	part decomp
16	single	15-30	4	NA	veg/bank moves	none detected	part decomp
17	multiple	30	5	6	veg/bank moves	none detected	part decomp
18	multiple	15	1.5	>10	veg/bank moves	none detected	part decomp
19	multiple	15	2	3	veg/bank moves	bed scour	part decomp
20	single	15-30	4	NA	veg/bank moves	none detected	little/no decomp
21	single w/rb	15	5	NA	when bed moves	bank scour	little/no decomp
22	single	15	4	NA	when bed moves	bed scour	part decomp
23	single w/rb	15	5	NA	veg/bank moves	bed scour/protect bnk	live
24	single w/rb	15-30	6	NA	veg/bank moves	none detected	part decomp
25	single	30-45	3	NA	veg/bank moves	bed scour	part decomp
26	single	15-30	5	NA	veg/bank moves	none detected	part decomp
27	multiple	15-30	1.5	>10	veg/bank moves	bank scour	part decomp
28	single	15-30	4	NA	veg/bank moves	protecting bank	part decomp
29	single	15	3	NA	veg/bank moves	none detected	part decomp
30	single	15-30	3	NA	when bed moves	none detected	part decomp
31	single	30-45	4	NA	highest flows	none detected	signif decomp

Rosie's Bridge to deDampierre Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part/full bed	pf	NA	pool	run	50	central low flow
2	no embed	perp	90	riffle	riffle	15	central low flow
3	part veg/bank	perp	90	riffle	riffle	15	RB low flow bank
4	part veg/bank	perp	90	run	run	50	RB low flow bank
5	no embed	pf	NA	riffle	riffle	75	RB low flow bank

6	part veg/bank	ds	unknown	riffle	riffle	75	RB low flow bank
7	no embed	pf	NA	riffle	run	75	LB bankfull bank
8	no embed	ds	<30	riffle	run	75	LB low flow bank
9	part veg/bank	pf	NA	run	run	100	LB bankfull bank
10	part veg/bank	pf	NA	run	run	100	LB bankfull bank
11	no embed	NA	NA	run	run	100	LB bankfull bank
12	no embed	pf	NA	run	run	100	LB bankfull bank
13	part/full bed	NA	NA	run	run	100	LB bankfull bank
14	no embed	NA	NA	riffle	riffle	50	LB bankfull bank
15	no embed	NA	NA	riffle	riffle	50	RB bankfull bank
16	part veg/bank	pf	NA	riffle	riffle	75	RB low flow bank
17	part veg/bank	NA	NA	riffle	riffle	50	LB bankfull bank
18	part veg/bank	NA	NA	riffle	riffle	50	LB bankfull bank
19	part veg/bank	NA	NA	pool	pool	75	RB low flow bank
20	part veg/bank	perp	90	pool	pool	75	LB bankfull bank
21	no embed	pf	NA	pool	pool	75	central bankfull bank
22	part/full bed	ds	<30	riffle	riffle	25	RB low flow bank
23	part veg/bank	pf	NA	pool	pool	50	RB low flow bank
24	part veg/bank	perp	90	run	run	50	LB low flow bank
25	part/full bed	ds	>30	pool	pool	10	LB low flow bank
26	part veg/bank	us	>30	pool	pool	10	RB low flow bank
27	part veg/bank	NA	NA	run	run	100	RB bankfull bank
28	part veg/bank	pf	NA	run	run	100	LB low flow bank
29	part veg/bank	pf	NA	run	run	100	LB bankfull bank
30	no embed	perp	90	run	run	100	RB bankfull bank
31	no embed	ds	30	run	run	100	RB bankfull bank

Rosie's Bridge to deDampierre Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	gravel	unknown	Stlhd/Stcklbk/Cryfish	under brdge	NA	yes	
2	cobble	unknown	none detected		NA	yes	C07
3	cobble	willow	none detected		NA	yes	C08
4	sand	oak	none detected		NA	no	
5	cobble	unknown	none detected	rep.highly mob.	NA	yes	
6	cobble	unknown	none detected		NA	yes	
7	sand	unknown	none detected		NA	no	
8	cobble	unknown	none detected		NA	no	
9	sand	unknown	none detected		NA	yes	
10	cobble	oak	none detected		NA	no	
11	cobble	unknown	none detected		NA	yes	
12	cobble	unknown	Stcklbk		NA	no	
13	cobble	unknown	none detected		3 x 5 x 2	no	
14	cobble	oak	none detected		5 x 3 x 1	no	
15	cobble	unknown	none detected	evident bank scour	4 x 4 x 1	yes	
16	sand	unknown	Stcklbk		NA	yes	C10
17	cobble	unknown	none detected		10 x 5 x 1	no	
18	cobble	unknown	none detected		7 x 4 x 1	no	
19	cobble	unknown	Stcklbk		3 x 2 x 2	yes	C11

20	gravel	unknown	none detected		NA	no	
21	cobble	willow	none detected		NA	no	C12
22	gravel	unknown	Stcklbk		NA	no	
23	gravel	willow	Stcklbk		NA	yes	
24	sand	unknown	none detected		NA	no	
25	gravel	unknown	Stlhd/Stcklbk/Rdlgfrg	undr girl scout brdg	NA	no	
26	cobble	unknown	none detected		NA	yes	C13
27	cobble	unknown	none detected		5 x 2 x 2	no	
28	cobble	unknown	Stcklbk		NA	yes	
29	gravel	unknown	Stlhd/Stcklbk		NA	no	
30	cobble	unknown	none detected		NA	no	
31	cobble	unknown	none detected		NA	no	

deDampierre to Saddle Club Reach of the Carmel River							September 14, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	#PIECES	MOBILITY	INFLUENCE	CONDITION
1	single w/rb	60	10	NA	highest flows	bed scour	part decomp
2	single w/rb	60	10	NA	highest flows	bed scour	part decomp
3	single w/rb	60	10	NA	highest flows	bed scour	part decomp
4	single w/rb	60	10	NA	highest flows	bed scour	part decomp
5	single w/rb	60	10	NA	highest flows	bed scour	part decomp
6	single w/rb	15	10	NA	veg/bank moves	bed scour	little/no decomp
7	single w/rb	60	8	NA	highest flows	bed scour	part decomp
8	single w/rb	150	15	NA	highest flows	bed scour	part decomp
9	multiple	15	4	7	veg/bank moves	none detected	part decomp
10	multiple	15	3	4	veg/bank moves	none detected	part decomp
11	multiple	30	2	4	veg/bank moves	bed scour	part decomp
12	single w/rb	45-60	10	NA	highest flows	bed scour	part decomp
13	rootball	45	2	NA	highly mobile	none detected	part decomp
14	multiple w/rb	15	3	4	veg/bank moves	bed scour	part decomp
15	single	15-30	5	NA	veg/bank moves	none detected	part decomp
16	single	15	3	NA	highly mobile	none detected	part decomp
17	multiple w/rb	30	5	3	veg/bank moves	bed scour	part decomp

deDampierre to Saddle Club Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part/full bed	us	30	pool	run	75	LB low flow bank
2	part/full bed	us	30	pool	run	75	RB low flow bank
3	part/full bed	us	30	pool	run	75	LB low flow bank
4	part/full bed	us	30	pool	run	75	LB low flow bank
5	part/full bed	us	30	pool	run	75	LB low flow bank
6	part veg/bank	ds	<30	pool	pool	30	LB low flow bank
7	no embed	ds	NA	riffle	riffle	30	central bankfull bank
8	part/full bed	ds	30	run	run	30	RB bankfull bank
9	part veg/bank	NA	NA	run	run	100	LB bankfull bank
10	part veg/bank	NA	NA	pool	pool	50	RB bankfull bank
11	part veg/bank	NA	NA	pool	pool	50	LB low flow bank
12	part veg/bank	pf	NA	pool	pool	50	LB low flow bank
13	no embed	NA	NA	pool	pool	50	LB low flow bank

14	part veg/bank	NA	NA	riffle	riffle	20	LB low flow bank
15	part veg/bank	pf	NA	riffle	riffle	40	LB low flow bank
16	no embed	us	<30	run	run	75	LB low flow bank
17	part veg/bank	NA	NA	run	run	75	LB bankfull bank

deDampierre to Saddle Club Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	cobble	redwood	Stlhd/Stcklbk/Cryfsh	placed	NA	yes	
2	cobble	redwood	Stlhd/Stcklbk/Cryfsh	placed	NA	yes	
3	cobble	redwood	Stlhd/Stcklbk/Cryfsh	placed	NA	yes	
4	cobble	redwood	Stlhd/Stcklbk/Cryfsh	placed	NA	yes	
5	cobble	redwood	Stlhd/Stcklbk/Cryfsh	placed	NA	yes	
6	cobble	unknown	Stcklbk/Cryfsh		NA	no	
7	cobble	oak	none detected		NA	yes	C15
8	gravel	oak	none detected		NA	yes	C14
9	cobble	unknown	none detected		3 x 5 x 1	no	
10	gravel	unknown	Stlhd/Stcklbk/Cryfsh/Pndtrtle		3 x 5 x 2	no	
11	sand	unknown	none detected		1 x 1 x 1	no	
12	sand	oak	Stlhd/Stcklbk/Redlgfrg		NA	yes	
13	cobble	unknown	Stcklbk		NA	no	
14	cobble	unknown	none detected		3 x 4 x 2	no	
15	cobble	unknown	Stcklbk		NA	no	
16	cobble	unknown	none detected		NA	no	
17	cobble	unknown	none detected		5 x 3 x 1	no	

Boronda to Garland Stables Reach of the Carmel River							August 31, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	# PIECES	MOBILITY	INFLUENCE	CONDITION
1	single	45	10	NA	veg/bank moves	bed scour	little/no decomp
2	single	15-30	3	NA	veg/bank moves	none detected	part decomp
3	single	15	3	NA	veg/bank moves	none detected	signif decomp
4	single	15-30	3	NA	veg/bank moves	none detected	part decomp
5	single	15	5	NA	veg/bank moves	bed scour	little/no decomp
6	single	30	3	NA	veg/bank moves	none detected	part decomp
7	multiple	15	2	3	veg/bank moves	none detected	part decomp
8	single w/rb	45	10	NA	veg/bank moves	none detected	signif decomp
9	single w/rb	15	2	NA	veg/bank moves	protecting bank	part decomp
10	single	15	3	NA	when bed moves	none detected	part decomp
11	multiple	15	3	4	veg/bank moves	bed scour	part decomp
12	single w/rb	30	7	NA	veg/bank moves	protecting bank	part decomp
13	single	15	4	NA	veg/bank moves	none detected	part decomp
14	single	15	3	NA	highly mobile	none detected	part decomp
15	single w/rb	45	2	NA	veg/bank moves	bed scour	part decomp
16	multiple	60	4	>10	veg/bank moves	none detected	part decomp
17	single w/rb	15	10	NA	veg/bank moves	bed scour/protect bnk	live
18	single	15	3	NA	highly mobile	none detected	part decomp
19	single	15-30	4	NA	veg/bank moves	none detected	little/no decomp
20	single	15	3	NA	veg/bank moves	none detected	part decomp
21	single w/rb	30	2	NA	when bed moves	none detected	signif decomp

22	single	30	7	NA	veg/bank moves	none detected	part decomp
23	single	15	4	NA	veg/bank moves	none detected	part decomp
24	multiple	15	3	2	veg/bank moves	none detected	part decomp
25	single	15	5	NA	when bed moves	bed scour	part decomp
26	single	30	4	NA	veg/bank moves	none detected	part decomp
27	single	15	2	NA	when bed moves	bed scour	signif decomp
28	multiple w/rb	30	3	>10	veg/bank moves	none detected	part decomp

Boronda to Garland Stables Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part veg/bank	us	>30	pool	pool	30	RB low flow bank
2	part veg/bank	pf	NA	glide	glide	20	LB low flow bank
3	part veg/bank	ds	<30	glide	glide	20	RB bankfull bank
4	part veg/bank	perp	90	glide	glide	20	RB bankfull bank
5	no embedment	perp	90	run	run	50	RB low flow bank
6	part veg/bank	perp	90	riffle	run	60	LB bankfull bank
7	part veg/bank	NA	NA	glide	glide	10	LB low flow bank
8	part veg/bank	pf	NA	glide	glide	10	LB low flow bank
9	part veg/bank	ds	unknown	riffle	riffle	30	RB low flow bank
10	no embedment	pf	NA	pool	pool	10	LB low flow bank
11	part veg/bank	NA	NA	run	run	50	RB bankfull bank
12	part veg/bank	pf	NA	run	run	50	RB bankfull bank
13	part veg/bank	pf	NA	run	run	50	RB bankfull bank
14	no embedment	ds	>30	riffle	riffle	10	RB bankfull bank
15	part veg/bank	us	>30	run	run	50	RB bankfull bank
16	part veg/bank	NA	NA	run	run	50	RB bankfull bank
17	part veg/bank	pf	NA	glide	glide	50	RB low flow bank
18	no embedment	ds	30	glide	glide	50	RB low flow bank
19	part veg/bank	ds	<30	glide	glide	50	LB low flow bank
20	part veg/bank	pf	NA	glide	glide	50	LB bankfull bank
21	part/full bed	pf	NA	glide	glide	50	LB floodplain/bench
22	part veg/bank	ds	30	glide	glide	50	LB bankfull bank
23	part veg/bank	ds	>30	pool	run	50	LB low flow bank
24	part veg/bank	NA	NA	glide	glide	50	LB low flow bank
25	part/full bed	ds	>30	pool	pool	50	central low flow
26	part veg/bank	us	<30	pool	pool	50	LB low flow bank
27	part/full bed	pf	NA	riffle	riffle	60	central low flow
28	part veg/bank	NA	NA	run	run	75	RB bankfull bank

Boronda to Garland Stables Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	sand	cottonwood	Stlhd/Stcklbk		NA	yes	
2	sand	unknown	Stcklbk		NA	no	
3	cobble	unknown	Stcklbk		NA	no	
4	cobble	cottonwood	Stcklbk		NA	no	
5	cobble	willow	Stlhd/Stcklbk/Cryfsh		NA	yes	C16
6	gravel	willow	Stcklbk/Cryfsh		NA	no	

7	sand	unknown	Stcklbk		4 x 2 x 2	yes	
8	sand	unknown	Stcklbk		NA	no	
9	gravel	unknown	none detected	braided (on left bank)	NA	no	
10	gravel	unknown	Stlhd/Stcklbk		NA	no	
11	cobble	unknown	none/undetected		2 x 3 x 2	no	
12	cobble	unknown	none detected		NA	no	
13	cobble	unknown	none detected		NA	no	
14	cobble	unknown	none detected		NA	no	
15	cobble	unknown	none detected		NA	no	
16	sand	unknown	none detected		12 x 4 x 2	no	
17	sand	sycamore	Stlhd/Stcklbk/Cryfsh		NA	no	
18	cobble	unknown	none detected		NA	no	
19	sand	willow	Stlhd		NA	no	
20	cobble	unknown	none detected		NA	no	
21	sand	unknown	none detected		NA	no	
22	cobble	unknown	none detected		NA	no	
23	sand	willow	Stlhd/Stcklbk		NA	no	
24	cobble	willow	Stcklbk		NA	no	
25	cobble	unknown	Stlhd/Stcklbk		NA	yes	
26	sand	sycamore	Stlhd/Stcklbk		NA	no	
27	cobble	unknown	Stlhd/Stcklbk		NA	no	
28	sand	unknown	none detected		10 x 5 x 4	yes	

Garland Stables to Garland Park Reach of the Carmel River							August 21, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	# PIECES	MOBILITY	INFLUENCE	CONDITION
1	multiple	45	5	3	veg/bank moves	none detected	part decomp
2	multiple	45	5	>10	veg/bank moves	bed scr/bank scr	signif decomp
3	single	30	4	NA	veg/bank moves	bank scour	signif decomp
4	single w/rb	45	10	NA	veg/bank moves	bed scour	live
5	single w/rb	30	5	NA	veg/bank moves	bed scour	part decomp
6	single	15	6	NA	veg/bank moves	none detected	part decomp
7	multiple	30	4	2	when bed moves	bed scour	part decomp
8	single w/rb	15	6	NA	when bed moves	bed scour	part decomp
9	multiple	30	4	unknown	highly mobile	none detected	part decomp
10	single w/rb	45	15	NA	highest flows	none detected	little/no decomp
11	single	15	8	NA	veg/bank moves	none detected	part decomp
12	single w/rb	60	2	NA	when bed moves	bed scour	part decomp
13	multiple	15	5	2	veg/bank moves	none detected	part decomp
14	multiple	15	5	5	veg/bank moves	none detected	part decomp
15	multiple	15	5	4	when bed moves	bed scour	part decomp
16	multiple	15	6	3	veg/bank moves	none detected	part decomp
17	single w/rb	45-60	6	NA	veg/bank moves	bed scour/protect bnk	part decomp
18	single	15	5	NA	veg/bank moves	protecting bank	part decomp
19	single w/rb	15	3	NA	highly mobile	none detected	part decomp
20	single	60	2	NA	highly mobile	none detected	part decomp
21	multiple	15	2	4	when bed moves	none detected	part decomp
22	multiple w/rb	15	1.5	>10	highest flows	bed scour	part decomp

23	single	15	4	NA	highly mobile	none detected	little/no decomp
24	multiple	30	5	unknown	veg/bank moves	none detected	part decomp
25	multiple	15	4	2	veg/bank moves	bed scour	part decomp
26	multiple w/rb	30	4	4	veg/bank moves	none detected	part decomp
27	multiple	15	2	5	veg/bank moves	none detected	part decomp
28	multiple	45	5	>10	veg/bank moves	none detected	part decomp
29	multiple w/rb	30	4	4	when bed moves	bed scour	part decomp
30	single w/rb	30	3	NA	veg/bank moves	none detected	signif decomp
31	multiple	15	3	2	veg/bank moves	none detected	part decomp
32	single w/rb	60	6	NA	veg/bank moves	none detected	part decomp
33	single	15	5	NA	veg/bank moves	none detected	live
35	multiple	15	2	3	veg/bank moves	none detected	part decomp
34	single	15	7	NA	veg/bank moves	none detected	part decomp

Garland Stables to Garland Park Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part veg/bank	NA	NA	riffle	run	50	RB bankfull bank
2	part veg/bank	NA	NA	riffle	run	50	RB bankfull bank
3	part veg/bank	pf	NA	riffle	run	unknown	RB bankfull bank
4	part/full bed	ds	30	glide	run	unknown	LB low flow bank
5	part veg/bank	ds	30	glide	glide	unknown	RB low flow bank
6	part veg/bank	NA	NA	glide	riffle	100	RB low flow bank
7	part veg/bank	NA	NA	run	run	10	RB low flow bank
8	part/full bed	pf	NA	pool	run	unknown	RB low flow bank
9	part veg/bank	NA	NA	run	run	150	LB bankfull bank
10	part veg/bank	ds	<30	run	run	100	LB bankfull bank
11	part veg/bank	ds	<30	run	run	100	RB low flow bank
12	part/full bed	ds	30	glide	riffle	10	LB low flow bank
13	part veg/bank	NA	NA	run	run	50	RB low flow bank
14	part veg/bank	NA	NA	run	run	50	LB low flow bank
15	part/full bed	NA	NA	riffle	riffle	50	central low flow
16	part veg/bank	NA	NA	pool	pool	75	LB low flow bank
17	part veg/bank	ds	<30	run	run	30	RB bankfull bank
18	part veg/bank	ds	<30	pool	pool	100	RB low flow bank
19	no embed	pf	NA	pool	pool	100	RB low flow bank
20	no embed	pf	NA	pool	pool	100	RB bankfull bank
21	part/full bed	NA	NA	pool	pool	30	LB low flow bank
22	part veg/bank	NA	NA	pool	pool	20	RB low flow bank
23	no embed	ds	>30	run	run	20	LB floodplain/bench
24	part veg/bank	NA	NA	pool	pool	50	LB bankfull bank
25	part veg/bank	NA	NA	pool	pool	50	LB bankfull bank
26	part veg/bank	NA	NA	pool	pool	50	LB bankfull bank
27	part veg/bank	NA	NA	pool	pool	50	LB bankfull bank
28	part veg/bank	NA	NA	pool	pool	50	LB bankfull bank
29	part/full bed	NA	NA	pool	run	50	RB low flow bank
30	part veg/bank	pf	NA	pool	pool	50	LB bankfull bank
31	part veg/bank	NA	NA	pool	pool	50	RB low flow bank
32	part veg/bank	ds	30	run	run	150	LB bankfull bank

33	part/full bed	ds	30	run	run	150	LB low flow bank
35	part veg/bank	NA	NA	riffle	run	20	RB bankfull bank
34	part veg/bank	ds	30	run	run	150	LB low flow bank

Garland Stables to Garland Park Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	sand	unknown	none detected		10 x 3 x 2	no	
2	sand	unknown	none detected		15 x 3 x 2	no	
3	sand	unknown	Stcklbk		NA	yes	
4	cobble	willow	Stcklbk		NA	yes	C18
5	cobble	unknown	Stcklbk/Cryfsh		NA	yes	
6	sand	unknown	Stcklbk/Cryfsh	tips of LWD touching	8 x 2 x 2	no	C19
7	sand	unknown	Stcklbk		5 x 1 x 1	no	
8	cobble	unknown	Stcklbk		NA	no	
9	cobble	unknown	none detected		5 x 2 x 1	yes	
10	sand	unknown	Stlhd/Stcklbk		NA	no	
11	cobble	unknown	Stlhd/Stcklbk		NA	no	
12	cobble	unknown	Stlhd/Stcklbk		NA	no	
13	sand	unknown	Stlhd/Stcklbk		5 x 2 x 2	no	
14	sand	unknown	Stlhd/Stcklbk		10 x 2 x 2	no	
15	cobble	unknown	Stlhd/Stcklbk		5 x 2 x 1	yes	
16	sand	unknown	Stlhd/Stcklbk		7 x 2 x .5	no	
17	sand	oak	Stlhd/Stcklbk/Cryfsh		NA	yes	
18	sand	unknown	Stlhd/Stcklbk		NA	no	
19	cobble	unknown	Stlhd/Stcklbk		NA	no	
20	sand	unknown	none detected	on bankfull breakpoint	NA	no	
21	gravel	unknown	Stlhd/Stcklbk/Cryfsh		5 x 5 x .5	no	
22	cobble	unknown	Stlhd/Stcklbk/frgs?	large rb with jam	10 x 10 x 6	yes	
23	cobble	cottonwood	none detected		NA	no	
24	cobble	unknown	none detected		8 x 5 x 4	no	
25	cobble	unknown	none detected		4 x 2 x 1	no	
26	cobble	unknown	none detected		5 x 2 x 3	no	
27	sand	unknown	none detected		3 x 2 x 1	no	
28	sand	unknown	none detected		7 x 5 x 4	no	
29	cobble	unknown	Stlhd/Stcklbk/Cryfsh/blfrg		5 x 2 x 1	yes	
30	cobble	unknown	none detected		NA	no	
31	sand	unknown	Stlhd/Stcklbk/Cryfsh		4 x 3 x 2	no	
32	sand	unknown	none detected		NA	no	
33	sand	willow	Stlhd/Stcklbk		NA	no	
35	sand	unknown	none detected		3 x 3 x 2	no	
34	sand	unknown	Stlhd/Stcklbk		NA	no	

Garland Park to Narrows Reach of the Carmel River

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PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	# PIECES	MOBILITY	INFLUENCE	CONDITION
1	single	15	3.5	NA	highly mobile	none detected	part decomp
2	multiple w/rb	15-30	3	4	veg/bank moves	protecting bank	part decomp
3	single	15-30	1.5	NA	veg/bank moves	bed scour	part decomp

4	single	15-30	3	NA	when bed moves	bed scour/protect bnk	part decomp
5	single	15	4	NA	highly mobile	none detected	part decomp
6	single w/rb	15-	2	NA	veg/bank moves	bank scour	part decomp
7	single	15-30	1.5	NA	when bed moves	none detected	part decomp
8	single	30-45	9	NA	veg/bank moves	none detected	part decomp
9	single	45	1.5	NA	veg/bank moves	none detected	part decomp
10	single	15	3	NA	when bed moves	bed scour	part decomp
11	multiple	15-30	5	3	veg/bank moves	bed scour	little/no decomp
12	single	15-30	5	NA	veg/bank moves	none detected	part decomp
13	single	15	5	NA	veg/bank moves	none detected	part decomp
14	single	15	6	NA	veg/bank moves	none detected	part decomp
15	single	15	4.5	NA	veg/bank moves	bank scour	part decomp
16	rootball	30-45	1.5	NA	veg/bank moves	bed scour	part decomp
17	single	15	3	NA	when bed moves	none detected	part decomp
18	single	15-30	2.5	NA	veg/bank moves	none detected	part decomp
19	single	15	2	NA	when bed moves	none detected	part decomp
20	single	15	5	NA	veg/bank moves	none detected	part decomp
21	single	15	4	NA	veg/bank moves	none detected	part decomp
22	single	15	3	NA	veg/bank moves	none detected	part decomp
23	multiple	15-30	5	4	veg/bank moves	protecting bank	part decomp
24	single	15	1.5	NA	veg/bank moves	protecting bank	signif decomp
25	single w/rb	15	4	NA	veg/bank moves	none detected	part decomp
26	single	15	4.5	NA	veg/bank moves	none detected	part decomp
27	single	15	2.5	NA	veg/bank moves	protecting bank	signif decomp
28	single w/rb	15-30	3	NA	veg/bank moves	bed scour	part decomp
29	multiple w/rb	45-60	2.5	3	veg/bank moves	bank scour	part decomp
30	multiple	15	3	3	veg/bank moves	bed scour	part decomp
31	single w/rb	15	2	NA	when bed moves	bed scour/protect bnk	part decomp
32	single	30	2	NA	highly mobile	none detected	part decomp
33	multiple	15	3	4	veg/bank moves	none detected	part decomp
34	multiple	15	4	2	veg/bank moves	none detected	part decomp
35	multiple	15	2	2	veg/bank moves	none detected	part decomp
36	single	30	3	NA	veg/bank moves	none detected	part decomp
37	single	15	4	NA	veg/bank moves	protecting bank	part decomp
38	single	15-30	3	NA	veg/bank moves	none detected	signif decomp
39	single w/rb	15	4	NA	when bed moves	none detected	part decomp
40	single	15	5	NA	highly mobile	none detected	part decomp
41	multiple	15	3	2	veg/bank moves	protecting bank	live
42	single	15	3	NA	when bed moves	bed scour	part decomp
43	multiple w/rb	15	5	2	veg/bank moves	bank scour	part decomp
44	single	45	2	NA	when bed moves	none detected	signif decomp
45	single	30	3	NA	veg/bank moves	none detected	signif decomp
46	single	15	2	NA	veg/bank moves	protecting bank	part decomp

Garland Park to Narrows Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	no embed	pf	NA	glide	glide	25	RB low flow bank
2	part veg/bank	NA	NA	glide	glide	25	LB bankfull bank
3	part veg/bank	perp	90	run	run	75	LB bankfull bank

4	part/full bed	pf	NA	glide	glide	25	RB low flow bank
5	no embed	pf	NA	riffle	riffle	15	central low flow
6	part veg/bank	ds	30	riffle	riffle	15	LB low flow bank
7	part/full bed	us	30	run	run	100	LB low flow bank
8	part veg/bank	ds	<30	run	run	100	LB low flow bank
9	part veg/bank	ds	30	riffle	riffle	50	LB low flow bank
10	part/full bed	pf	NA	glide	glide	25	RB low flow bank
11	part veg/bank	NA	NA	riffle	riffle	25	LB low flow bank
12	part veg/bank	ds	30	riffle	riffle	25	LB low flow bank
13	part veg/bank	pf	NA	riffle	riffle	25	LB bankfull bank
14	part veg/bank	perp	90	run	run	75	RB low flow bank
15	part veg/bank	ds	<30	run	run	75	RB low flow bank
16	part veg/bank	NA	NA	pool	pool	75	RB low flow bank
17	part/full bed	ds	<30	run	run	75	RB low flow bank
18	part veg/bank	pf	NA	run	run	75	LB low flow bank
19	part/full bed	pf	NA	run	run	75	LB low flow bank
20	part veg/bank	pf	NA	riffle	riffle	50	RB bankfull bank
21	part veg/bank	ds	30	run	run	75	RB low flow bank
22	part veg/bank	perp	90	run	run	75	RB bankfull bank
23	part veg/bank	NA	NA	riffle	riffle	25	RB bankfull bank
24	part veg/bank	pf	NA	run	run	75	RB low flow bank
25	part veg/bank	pf	NA	run	run	75	RB bankfull bank
26	part veg/bank	us	<30	glide	glide	25	LB bankfull bank
27	fully w/veg	us	<30	glide	glide	25	RB low flow bank
28	part veg/bank	ds	30	glide	glide	25	LB bankfull bank
29	part veg/bank	NA	NA	pool	pool	75	RB bankfull bank
30	part veg/bank	NA	NA	pool	pool	75	LB bankfull bank
31	part veg/bank	pf	NA	pool	pool	75	LB low flow bank
32	no embed	ds	<30	riffle	riffle	25	RB bankfull bank
33	part veg/bank	NA	NA	riffle	riffle	30	LB low flow bank
34	part veg/bank	NA	NA	run	run	50	LB bankfull bank
35	part veg/bank	NA	NA	glide	glide	25	RB low flow bank
36	part veg/bank	ds	<30	riffle	riffle	75	LB bankfull bank
37	part veg/bank	pf	NA	riffle	riffle	75	LB low flow bank
38	part veg/bank	pf	NA	pool	pool	75	RB bankfull bank
39	part/full bed	perp	90	riffle	riffle	30	RB low flow bank
40	no embed	pf	NA	riffle	riffle	50	LB low flow bank
41	part veg/bank	NA	NA	pool	pool	75	RB low flow bank
42	fully w/veg	unknown	unknown	run	run	50	RB low flow bank
43	part veg/bank	NA	NA	riffle	riffle	25	RB low flow bank
44	no embed	unknown	unknown	run	run	50	LB bankfull bank
45	no embed	unknown	unknown	run	run	50	LB low flow bank
46	fully w/veg	unknown	unknown	riffle	riffle	25	LB low flow bank

Garland Park to Narrows Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	cobble	unknown	none detected			no	C20
2	cobble	willow/othr	none detected		5 x 5 x 2	yes	
3	cobble	unknown	Stlhd			yes	C21

4	sand	unknown	Stlhd/Stcklbk/Cryfsh			yes	C22 (C23)?
5	cobble	unknown	Stlhd/Cryfsh			no	
6	cobble	unknown	Stlhd/Stcklbk/Cryfsh			no	
7	cobble	unknown	Stlhd/Cryfsh			no	
8	sand	unknown	Stlhd/Cryfsh			no	
9	sand	oak	none detected			no	
10	cobble	unknown	none detected			no	
11	sand	willow	none detected		6 x 1 x 1	no	
12	cobble	willow	none detected			no	
13	sand	unknown	none detected			no	
14	cobble	willow	Stlhd/Stcklbk	freshly fallen/brittle		no	
15	sand	unknown	none detected			no	
16	cobble	unknown	Stlhd	under bridge		yes	
17	cobble	unknown	none detected			no	
18	sand	unknown	none detected			no	
19	cobble	unknown	Stcklbk/Cryfsh			no	
20	cobble	willow	none detected			no	
21	cobble	unknown	none detected			no	
22	cobble	willow	none detected			yes	
23	cobble	willow	none detected		10 x 2 x 1	no	
24	cobble	unknown	none detected			no	
25	cobble	willow	none detected			no	
26	cobble	willow	none detected			yes	
27	sand	unknown	Stcklbk			no	
28	cobble	unknown	none detected			yes	
29	sand	unknown	Stlhd/Stcklbk/Cryfsh		5 x 4 x 3	yes	
30	cobble	unknown	Cryfsh		4 x 5 x 1.5	yes	
31	sand	unknown	Stcklbk/Cryfsh			no	
32	cobble	unknown	none detected			no	
33	cobble	unknown	none detected		3 x 5 x 2	no	
34	gravel	willow	none detected		10 x 2 x 1	no	
35	cobble	unknown	none detected		3 x 5 x 1.5	no	
36	gravel	willow	Stcklbk/Cryfsh			no	
37	cobble	unknown	none detected			yes	
38	sand	unknown	Cryfsh/Blfrg/Wstrnrtle	3 turtles spotted		no	
39	cobble	unknown	Stlhd			no	
40	cobble	willow	Stlhd			no	
41	cobble	willow	Cryfsh		5 x 2 x 1	yes	
42	cobble	unknown	Cryfsh			no	
43	boulder	unknown	none detected		5 x 1 x 1	no	
44	gravel	unknown	none detected			no	
45	sand	unknown	none detected			yes	
46	gravel	unknown	none detected			no	

Narrows to Scarlett Reach of the Carmel River							September 19, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	#PIECES	MOBILITY	INFLUENCE	CONDITION
1	single	15	5	NA	veg/bank moves	none detected	part decomp

2	single w/rb	15	3	NA	when bed moves	bed scour	part decomp
3	single	15	8	NA	veg/bank moves	none detected	part decomp
4	single	15	5	NA	veg/bank moves	none detected	part decomp
5	single	15	4	NA	when bed moves	protecting bank	signif decomp
6	single	15	1.5	NA	when bed moves	bed scour	part decomp
7	single	15	3	NA	when bed moves	bed scour	signif decomp
8	single	15	4	NA	veg/bank moves	none detected	little/no decomp
9	single w/rb	15-30	3	NA	veg/bank moves	none detected	part decomp
10	rootball	30	2	NA	veg/bank moves	bed scour	live
11	single	15	1.5	NA	highly mobile	none detected	part decomp
12	single	30	2	NA	veg/bank moves	none detected	part decomp
13	single	15-30	4	NA	highly mobile	bed scour	little/no decomp
14	single	15-30	5	NA	veg/bank moves	none detected	little/no decomp
15	multiple	15	1.5	3	veg/bank moves	none detected	part decomp
16	single	45	4	NA	veg/bank moves	none detected	part decomp
17	single	60	2	NA	highly mobile	none detected	signif decomp
18	single	30-45	2	NA	veg/bank moves	none detected	signif decomp
19	single	30	2.5	NA	highly mobile	none detected	little/no decomp
20	single	15	3	NA	when bed moves	none detected	part decomp
21	single	15-30	5	NA	when bed moves	none detected	part decomp
22	single	15-30	7	NA	veg/bank moves	none detected	part decomp
23	single w/rb	30	2	NA	when bed moves	bed scour	signif decomp
24	single w/rb	30	2	NA	when bed moves	bed scour	signif decomp
25	single w/rb	30	1.5	NA	when bed moves	bed scour	part decomp
26	single	10	7	NA	veg/bank moves	none detected	part decomp
27	single	15	2	NA	when bed moves	none detected	part decomp
28	single	30	5	NA	veg/bank moves	none detected	part decomp
29	multiple	30	8	NA	when bed moves	bed scour	live
30	multiple w/rb	30	3	3	veg/bank moves	none detected	part decomp
31	single	15	2.5	NA	when bed moves	bed scour	part decomp
32	single	15-30	2.5	NA	veg/bank moves	none detected	part decomp
33	single	15	unknown	NA	highly mobile	none detected	signif decomp
34	single	15	10	NA	veg/bank moves	none detected	live
35	single	15	2	NA	highly mobile	none detected	part decomp
36	single	15	3	NA	veg/bank moves	bed scour	little/no decomp
37	single w/rb	15	4	NA	veg/bank moves	protecting bank	part decomp
38	rootball	60	1	NA	veg/bank moves	none detected	part decomp
39	single	15-30	7	NA	veg/bank moves	none detected	little/no decomp

Narrows to Scarlett Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part veg/bank	pf	NA	run	run	100	LB bankfull bank
2	part/full bed	pf	NA	run	run	100	LB low flow bank
3	part veg/bank	perp	90	run	run	100	LB low flow bank
4	part veg/bank	perp	90	riffle	riffle	20	RB bankfull bank
5	part/full bed	pf	NA	run	run	75	RB low flow bank
6	part/full bed	ds	30	run	run	75	LB low flow bank
7	part/full bed	pf	NA	glide	glide	10	central low flow

8	part veg/bank	pf	NA	pool	pool	50	LB bankfull bank
9	part veg/bank	pf	NA	pool	pool	50	RB bankfull bank
10	part veg/bank	NA	NA	pool	pool	10	RB low flow bank
11	no embedment	ds	<30	run	run	100	LB lowflow bank
12	part veg/bank	ds	>30	glide	glide	10	RB low flow bank
13	no embedment	pf	NA	riffle	riffle	30	RB low flow bank
14	part veg/bank	ds	>30	riffle	run	25	RB low flow bank
15	part veg/bank	NA	NA	riffle	run	25	LB bankfull bank
16	part veg/bank	pf	NA	unknown	unknown	unknown	LB bankfull bank
17	no embedment	perp	90	unknown	unknown	unknown	LB bankfull bank
18	part veg/bank	ds	30	riffle	riffle	30	RB low flow bank
19	no embedment	perp	90	run	run	50	LB low flow bank
20	part veg/bank	pf	NA	run	run	100	RB low flow bank
21	no embedment	ds	30	run	run	100	LB low flow bank
22	part veg/bank	ds	<30	glide	glide	10	LB low flow bank
23	part/full bed	pf	NA	pool	pool	30	central low flow
24	part/full bed	us	30	pool	pool	30	central low flow
25	part/full bed	ds	<30	pool	pool	30	central low flow
26	part veg/bank	ds	<30	glide	glide	10	LB low flow bank
27	part/full bed	us	<30	glide	glide	20	RB low flow bank
28	part veg/bank	perp	90	riffle	riffle	10	LB low flow bank
29	part/full bed	NA	NA	pool	pool	20	central low flow
30	part veg/bank	NA	NA	riffle	riffle	20	LB low flow bank
31	part/full bed	perp	90	riffle	riffle	10	RB low flow bank
32	part veg/bank	pf	NA	pool	pool	25	LB low flow bank
33	no embedment	ds	<30	pool	pool	25	LB low flow bank
34	part veg/bank	perp	90	run	run	25	LB low flow bank
35	no embedment	perp	90	riffle	riffle	20	LB bankfull bank
36	part veg/bank	ds	<30	run	run	20	LB low flow bank
37	part veg/bank	ds	<30	pool	pool	20	LB low flow bank
38	part veg/bank	NA	NA	pool	pool	75	LB bankfull bank
39	no embedment	perp	90	pool	pool	75	LB bankfull bank

Narrows to Scarlett Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	sand	unknown	Crayfish		NA	no	
2	gravel	unknown	Stcklbk/Cryfsh		NA	no	
3	cobble	willow	none detected	freshly fallen	NA	no	
4	sand	unknown	none detected		NA	yes	
5	sand	unknown	Stcklbk		NA	yes	
6	sand	unknown	none detected		NA	no	
7	cobble	unknown	none detected		NA	yes	
8	sand	unknown	Crayfish	freshly fallen	NA	no	
9	gravel	unknown	none detected		NA	no	
10	gravel	unknown	Stcklbk		NA	no	
11	sand	unknown	none detected		NA	no	
12	gravel	unknown	none detected		NA	no	
13	cobble	willow	none detected		NA	no	

14	cobble	willow	none detected		NA	no	
15	sand	unknown	Crayfish		3 x 2 x 3	no	
16	sand	unknown	none detected		NA	no	
17	cobble	unknown	none detected		NA	no	
18	cobble	unknown	Stlhd/Stcklbk/Cryfsh		NA	no	
19	sand	unknown	Crayfish	freshly fallen	NA	no	
20	cobble	unknown	Stcklbk/Frgs?		NA	no	
21	sand	unknown	Stcklbk/Cryfsh/Rdlgfrg		NA	no	
22	cobble	willow	Stcklbk/Cryfsh/Rdlgfrg		NA	no	
23	cobble	unknown	Crayfish		NA	yes	
24	cobble	unknown	Crayfish		NA	no	
25	cobble	unknown	Crayfish		NA	no	
26	cobble	unknown	Crayfish	freshly fallen	NA	no	
27	sand	unknown	Crayfish	in cat tails	NA	no	
28	cobble	unknown	Stcklbk	freshly fallen	NA	no	
29	cobble	unknown	none detected		5 x 10 x 2	yes	
30	riffle	unknown	none detected		5 x 3 x 2	no	
31	cobble	unknown	none detected				
32	cobble	unknown	Stcklbk/Cryfsh				
33	cobble	unknown	Crayfish				
34	cobble	cottonwood	Crayfish	freshly fallen			
35	cobble	unknown	none detected				
36	cobble	willow	none detected				
37	cobble	willow	Crayfish				
38	cobble	unknown	none detected				
39	sand	cottonwood	none detected	freshly fallen			

Scarlett to Robinson Reach of the Carmel River							September 27, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	#PIECES	MOBILITY	INFLUENCE	CONDITION
1	single	15	4	NA	veg/bank moves	none detected	part decomp
2	single w/rb	15	4	NA	veg/bank moves	none detected	part decomp
3	multiple	30-45	3	3	veg/bank moves	bank scour	part decomp
4	multiple	45	2	2	veg/bank moves	bed scour	part decomp
5	single	15	5	NA	when bed moves	bed scour	part decomp
6	multiple	15	2.5	3	veg/bank moves	bed scour	part decomp
7	multiple w/rb	15	2	>10	veg/bank moves	none detected	part decomp
8	single	15-30	2	NA	veg/bank moves	none detected	part decomp
9	multiple	15	2	>10	veg/bank moves	bed scour	part decomp
10	multiple w/rb	30	4	4	veg/bank moves	bed scour	little/no decomp
11	multiple	15	2	2	veg/bank moves	bed scour	part decomp
12	single w/rb	30-45	4	NA	highest flows	none detected	little/no decomp
13	single	15	3	NA	highly mobile	none detected	part decomp
14	single w/rb	15	4	NA	veg/bank moves	none detected	part decomp
15	single	15-30	5	NA	veg/bank moves	none detected	little/no decomp
16	multiple	15	3	3	veg/bank moves	none detected	part decomp
17	single w/rb	15	2.5	NA	veg/bank moves	bank scour	part decomp
18	single	15-30	6	NA	veg/bank moves	none detected	part decomp
19	single	15-30	5	NA	veg/bank moves	none detected	live

20	single w/rb	15-30	5	NA	veg/bank moves	bed scour	part decomp
21	multiple	15	2	2	veg/bank moves	none detected	part decomp
22	single	45-60	5	NA	when bed moves	bed scour	part decomp

Scarlett to Robinson Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part veg/bank	pf	NA	riffle	riffle	15	RB bankfull bank
2	part veg/bank	pf	NA	run	run	200	RB floodplain/bench
3	part veg/bank	NA	NA	run	run	200	RB bankfull bank
4	part veg/bank	NA	NA	run	run	200	RB bankfull bank
5	part/full bed	ds	<30	run	run	200	RB low flow bank
6	part veg/bank	NA	NA	pool	pool	50	RB bankfull bank
7	part veg/bank	NA	NA	run	run	25	RB bankfull bank
8	part veg/bank	perp	90	pool	pool	50	RB bankfull bank
9	part veg/bank	NA	NA	run	run	25	RB bankfull bank
10	part veg/bank	NA	NA	pool	pool	75	RB bankfull bank
11	part/full bed	NA	NA	run	run	200	LB low flow bank
12	part veg/bank	pf	NA	glide	glide	10	LB bankfull bank
13	part veg/bank	us	>30	run	run	100	LB bankfull bank
14	part veg/bank	pf	NA	run	run	100	LB low flow bank
15	part veg/bank	pf	NA	glide	glide	20	RB low flow bank
16	part veg/bank	NA	NA	riffle	riffle	50	central low flow
17	part veg/bank	pf	NA	riffle	riffle	20	RB low flow bank
18	part veg/bank	pf	NA	riffle	run	75	LB low flow bank
19	part veg/bank	ds	30	run	run	75	RB low flow bank
20	part veg/bank	ds	30	run	run	75	RB low flow bank
21	part veg/bank	NA	NA	pool	pool	20	LB low flow bank
22	part/full bed	pf	NA	riffle	riffle	50	RB low flow bank

Scarlett to Robinson Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	cobble	unknown	Blfrg/Rdlgrg		NA	no	
2	sand	unknown	none detected		NA	no	
3	cobble	unknown	none detected		4 x 3 x 1	yes	
4	cobble	unknown	none detected		2 x 2 x 1	no	
5	sand	oak	Stcklbk		NA	no	
6	cobble	unknown	none detected		3 x 3 x 2	yes	
7	gravel	unknown	none detected		10 x 5 x 1	yes	
8	cobble	unknown	none detected		NA	no	
9	cobble	unknown	none detected		8 x 5 x 1	no	
10	cobble	unknown	none detected		5 x 2 x 2	no	
11	sand	unknown	Stlhd/Stcklbk/Blfrg		4 x 2 x 1	no	
12	sand	unknown	Blfrg/Stlhd/Stcklbk/Wstrn Trtle	next to golf course	NA	yes	
13	cobble	unknown	none detected		NA	no	
14	cobble	unknown	Stlhd/Stcklbk		NA	no	
15	gravel	unknown	Stlhd/Stcklbk		NA	no	
16	cobble	unknown	none detected		5 x 5 x 3	no	

17	gravel	unknown	none detected		NA	no	
18	gravel	unknown	Stlhd/Stcklbk/Cryfsh		NA	yes	
19	sand	cottonwood	Stlhd/Stcklbk/Cryfsh		NA	no	
20	cobble	willow	Crayfish		NA	no	
21	sand	unknown	Stcklbk/Cryfsh		4 x 3 x 1	no	
22	gravel	unknown	none detected	Lrge/Angled upward	NA	yes	B30

Robinson Canyon to Upstream Schulte Reach of the Carmel River							
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	#PIECES	MOBILITY	INFLUENCE	CONDITION
1	single	30	2	NA	when bed moves	bed scour	signif decomp
2	multiple	15-30	2	2	veg/bank moves	none detected	part decomp
3	multiple	45	5	5	veg/bank moves	none detected	little/no decomp
4	single	60	2	NA	highly mobile	bed scour	part decomp
5	multiple	15	2	3	veg/bank moves	none detected	part decomp
6	single	30	7	NA	veg/bank moves	none detected	signif decomp
7	multiple	15	1.5	6	veg/bank moves	none detected	signif decomp
8	multiple	15	1.5	>10	veg/bank moves	none detected	part decomp
9	single	15	1.5	NA	veg/bank moves	bed scour	part decomp
10	single	45	3	NA	when bed moves	none detected	part decomp
11	single	30	3	NA	veg/bank moves	none detected	part decomp
12	single	15	3	NA	when bed moves	bed scour	part decomp
13	single	30	7	NA	veg/bank moves	bed scour/protect bnk	little/no decomp
14	single	45	10	NA	veg/bank moves	protecting bank	part decomp
15	single	45	2	NA	highly mobile	none detected	part decomp
16	single w/rb	45	4	NA	when bed moves	bed scour	part decomp
17	single	15	5	NA	highly mobile	bed scour	part decomp
18	multiple	30	3	NA	veg/bank moves	bed scour/protect bnk	part decomp
19	multiple	30	2	NA	veg/bank moves	none detected	part decomp
20	single	60	2.5	NA	veg/bank moves	none detected	signif decomp
21	multiple	15	1.5	3	veg/bank moves	none detected	part decomp
22	multiple	15	2	>6	veg/bank moves	bed scour	part decomp
23	single	45	5	NA	veg/bank moves	none detected	part decomp
24	multiple	15	2	NA	veg/bank moves	none detected	part decomp

Robinson Canyon to Upstream Schulte Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part/full bed	ds	30	glide	glide	15	RB low flow bank
2	part veg/bank	NA	NA	glide	glide	20	LB bankfull bank
3	part veg/bank	NA	NA	riffle	riffle	25	LB bankfull bank
4	no embed	perp	90	pool	pool	15	LB low flow bank
5	part veg/bank	NA	NA	pool	run	100	LB bankfull bank
6	part veg/bank	us	>30	pool	pool	75	LB bankfull bank
7	part veg/bank	NA	NA	pool	run	100	LB bankfull bank
8	part veg/bank	NA	NA	pool	run	100	LB bankfull bank
9	part veg/bank	unkown	unknown	glide	glide	50	central low flow
10	part veg/bank	pf	NA	pool	pool	50	RB bankfull bank
11	part veg/bank	perp	90	riffle	riffle	25	LB bankfull bank

12	part veg/bank	unknown	unknown	riffle	riffle	25	LB bankfull bank
13	part veg/bank	pf	NA	pool	riffle	25	LB low flow bank
14	part veg/bank	pf	NA	pool	riffle	25	RB bankfull bank
15	no embed	ds	<30	pool	riffle	25	LB bankfull bank
16	part/full bed	pf	NA	run	run	200	central low flow
17	no embed	pf	NA	run	run	200	central low flow
18	part veg/bank	NA	NA	run	run	200	LB floodplain/bench
19	part veg/bank	NA	NA	run	run	200	LB floodplain/bench
20	part veg/bank	perp	90	run	run	200	LB bankfull bank
21	part veg/bank	NA	NA	glide	glide	20	LB bankfull bank
22	part veg/bank	NA	NA	run	run	100	LB bankfull bank
23	part veg/bank	perp	90	pool	pool	10	LB bankfull bank
24	part veg/bank	NA	NA	run	run	200	RB bankfull bank

Robinson Canyon to Upstream Schulte Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAG E	TAGGED
1	gravel	unknown	Stlhd/Stcklbk	dwnstrm/undr Robin.Brdge	NA	yes	B33
2	cobble	unknown	Blfrg/Stlhd/Stcklbk		2 x 5 x ?		
3	cobble	cottonwood	Blfrg/Stlhd/Stcklbk/Cryfsh	lrg cottonwood/slight jam	7 x 15	yes	B31
4	cobble	unknown	Stlhd/Stcklbk/Cryfsh		NA	no	
5	cobble	unknown	Stlhd/Stcklbk/Cryfsh		2 x 3	no	
6	sand	unknown	none detected	high on bnkful/floodplain	NA	no	
7	sand	unknown	Stlhd/Stcklbk/Cryfsh		2 x 5	no	
8	sand	unknown	Stlhd/Stcklbk/Cryfsh		2 x 5	no	
9	gravel	unknown	Stlhd/Stcklbk/Cryfsh		NA	no	
10	sand	unknown	Stlhd/Stcklbk/Cryfsh		NA	no	
11	cobble	unknown	Stlhd/Stcklbk/Cryfsh		NA	no	
12	cobble	willow	Stlhd/Stcklbk/Cryfsh		NA	no	
13	cobble	willow	Blfrg/Stlhd/Stcklbk/Cryfsh		NA	no	
14	sand	unknown	Blfrg/Stlhd/Stcklbk/Cryfsh		NA	no	
15	cobble	unknown	none detected		NA	no	
16	cobble	unknown	Blfrg/Stlhd/Stcklbk/Cryfsh		NA	no	
17	cobble	unknown	Blfrg/Stlhd/Stcklbk/Cryfsh		NA	no	
18	cobble	unknown	none detected		3 x 8	no	
19	cobble	unknown	none detected		3 x 30	no	
20	cobble	unknown	Stlhd/Stcklbk/Cryfsh		NA	no	
21	sand	unknown	Stlhd/Stcklbk		2 x 3	no	
22	cobble	unknown	Blfrg/Stlhd/Stcklbk	alot of little pieces in accu.	2 x 5	no	
23	gravel	unknown	Blfrg/Stlhd/Stcklbk/Cryfsh		NA	no	
24	sand	unknown	Blfrg/Stlhd/Stcklbk/Cryfsh		3 x 7	no	

Upstream Shulte to Downstream Shulte							October 9, 2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	#PIECES	MOBILITY	INFLUENCE	CONDITION
1	single w/rb	15	3.5	NA	veg/bank moves	bed scour/protect bnk	part decomp
2	rootball	60	1.5	NA	highest flows	none detected	part decomp
3	multiple	15	2	3	veg/bank moves	none detected	part decomp
4	single	15	3	NA	when bed moves	bed scour	part decomp

5	single	15-30	5	NA	when bed moves	none detected	part decomp
6	multiple	15	1.5	4	veg/bank moves	none detected	part decomp
7	multiple	15	3	3	veg/bank moves	bed scour	part decomp
8	multiple w/rb	15-30	4	2	veg/bank moves	bed scour/protect bnk	part decomp
9	single w/rb	15-30	6	NA	veg/bank moves	none detected	little/no decomp
10	single	15	2	NA	highly mobile	none detected	little/no decomp
11	single w/rb	15	7.5	NA	veg/bank moves	bed scour	little/no decomp
12	single	15	3	NA	veg/bank moves	none detected	little/no decomp
13	multiple	15-30	7	3	veg/bank moves	bed scour	part decomp
14	single w/rb	15-30	4	NA	veg/bank moves	none detected	little/no decomp
15	single w/rb	15-30	4	NA	when bed moves	bed scour	part decomp
16	single	15	4	NA	veg/bank moves	none detected	part decomp
17	single	15	3	NA	veg/bank moves	none detected	little/no decomp
18	single	15	3	NA	veg/bank moves	none detected	little/no decomp
19	single	15	3	NA	veg/bank moves	none detected	little/no decomp
20	single	15	3	NA	veg/bank moves	none detected	little/no decomp

Upstream Schulte to Downstream Schulte (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part veg/bank	pf	NA	run	run	100	RB low flow bank
2	part veg/bank	NA	NA	run	run	100	LB floodplain/bench
3	part veg/bank	NA	NA	riffle	riffle	25	LB bankfull bank
4	part/full bed	pf	NA	run	run	100	central low flow
5	part/full bed	pf	NA	run	run	100	LB low flow bank
6	part veg/bank	NA	NA	riffle	riffle	25	RB low flow bank
7	part veg/bank	NA	NA	pool	pool	30	LB low flow bank
8	part veg/bank	NA	NA	riffle	riffle	25	RB low flow bank
9	part veg/bank	pf	NA	pool	pool	50	RB low flow bank
10	part veg/bank	ds	30	run	run	100	LB floodplain/bench
11	part veg/bank	ds	<30	run	run	100	RB low flow bank
12	part veg/bank	NA	NA	run	run	100	RB low flow bank
13	part veg/bank	NA	NA	pool	pool	unknown	RB low flow bank
14	part veg/bank	ds	30	run	run	100	RB low flow bank
15	no embed	pf	NA	run	run	100	LB low flow bank
16	part veg/bank	pf	NA	run	run	100	RB low flow bank
17	part veg/bank	NA	NA	run	run	200	RB low flow bank
18	part veg/bank	NA	NA	run	run	200	RB low flow bank
19	part veg/bank	NA	NA	run	run	200	RB low flow bank
20	part veg/bank	NA	NA	run	run	200	RB low flow bank

Upstream Schulte to Downstream Schulte (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	gravel	unknown	Stlhd/Stcklbk		NA	yes	
2	sand	unknown			NA	no	
3	cobble	unknown			6 x 4 x 2.5	no	
4	cobble	unknown	Stlhd/Stcklbk		NA	no	
5	cobble	unknown	Stlhd/Stcklbk		NA	yes	

6	cobble	unknown			5 x 3 x 2	no	
7	gravel	unknown			4 x 4 x 1	yes	
8	cobble	unknown			10 x 1 x 1	yes	B34/B35
9	cobble	willow			NA	no	
10	cobble	unknown			NA	no	
11	sand	willow	Stlhd/Stcklbk		NA	no	
12	sand	unknown			NA	yes	B36
13	gravel	unknown			unknown	yes	
14	cobble	unknown	Stlhd/Stcklbk		NA	yes	B37
15	cobble	unknown			NA	no	
16	cobble	unknown	Stcklbk		NA	yes	B38
17	sand	unknown	Rdlgfrg	Jack	NA	no	
18	sand	unknown	Rdlgfrg/Stcklbk	Jack	NA	no	
19	sand	unknown	Rdlgfrg/Stcklbk	Jack	NA	no	
20	sand	unknown	Rdlgfrg/Stcklbk	Jack	NA	no	

Downstream Schulte to Quail Lodge Reach of the Carmel River							2003
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	# PIECES	MOBILITY	INFLUENCE	CONDITION
10	single	15-30	3	NA	veg/bank moves	none detected	little/no decomp
11	single	15-30	3	NA	veg/bank moves	none detected	little/no decomp
12	single w/rb	150	5	NA	veg/bank moves	protecting bank	part decomp
13	single	30	5	NA	veg/bank moves	bed scour	part decomp
14	single	30	3	NA	veg/bank moves	bed scour	part decomp
15	single	30	3	NA	veg/bank moves	bed scour	part decomp
16	single	30	2	NA	veg/bank moves	bed scour	part decomp
17	single	30	1.5	NA	when bed moves	none detected	part decomp
18	single	60	2	NA	highest flows	bed scour	part decomp
19	single	45	5	NA	highest flows	protecting bank	part decomp
20	single	45	3	NA	highest flows	protecting bank	part decomp
21	single	45	3	NA	highest flows	bed scour	part decomp
22	single	65	2	NA	highest flows	protecting bank	part decomp
23	single	60	2	NA	highest flows	bed scour	part decomp
24	single	60	2	NA	highest flows	none detected	part decomp
25	single	45	2	NA	highest flows	bed scour	part decomp
26	single	45	2	NA	highest flows	bed scour	part decomp
27	single	30	1.5	NA	highest flows	bed scour	part decomp
28	single	45	2	NA	highest flows	bed scour	part decomp
29	single	45	1.5	NA	highest flows	bed scour	part decomp
30	single	45	1.5	NA	highest flows	bed scour	part decomp
31	single	45	2	NA	highest flows	bed scour	part decomp
32	single	45	2	NA	veg/bank moves	none detected	part decomp
33	single	45	12	NA	veg/bank moves	bed scour	part decomp
34	single w/rb	30	5	NA	when bed moves	none detected	part decomp
35	single	45	2	NA	veg/bank moves	none detected	part decomp
41	multiple	30	5	3	veg/bank moves	bed scour	part decomp
42	single	45	2	NA	highest flows	bed scour	part decomp
43	single	45	3	NA	highest flows	none detected	part decomp
44	single	45	3	NA	highest flows	none detected	part decomp

45	single w/rb	45	7	NA	veg/bank moves	none detected	part decomp
46	single	45	2	NA	highly mobile	none detected	part decomp
47	single	45	2	NA	highly mobile	bed scour	part decomp
48	single	45	2	NA	highly mobile	none detected	part decomp
49	single w/rb	45	5	NA	veg/bank moves	none detected	part decomp
50	single	15	1.5	NA	when bed moves	bed scour	part decomp
51	single	15	6	NA	when bed moves	none detected	part decomp
52	multiple	30	4	3	veg/bank moves	protecting bank	part decomp
53	multiple	45	7	3	veg/bank moves	none detected	part decomp
54	single	45	3	NA	when bed moves	protecting bank	signif decomp
36	multiple	15	2	2	veg/bank moves	none detected	part decomp
37	single	15-30	2	NA	highly mobile	none detected	part decomp
38	single	30-45	15	NA	veg/bank moves	none detected	little/no decomp
39	single	45	5	NA	veg/bank moves	protecting bank	part decomp
40	single w/rb	45	7	NA	veg/bank moves	none detected	signif decomp
55	single	15	6	NA	veg/bank moves	none detected	part decomp
56	single	45	15	NA	veg/bank moves	bed scour	little/no decomp
57	single	30	7	NA	veg/bank moves	none detected	little/no decomp
58	single	30	10	NA	veg/bank moves	none detected	little/no decomp

Downstream Shulte to Quail Lodge Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
10	part veg/bank	NA	NA	pool	pool	20	RB low flow bank
11	part veg/bank	NA	NA	pool	pool	20	RB low flow bank
12	part veg/bank	pf	NA	pool	pool	20	RB low flow bank
13	part veg/bank	ds	30	run	run	100	RB low flow bank
14	part veg/bank	ds	30	run	run	100	RB low flow bank
15	part veg/bank	ds	30	run	run	100	RB low flow bank
16	part veg/bank	ds	30	run	run	100	RB low flow bank
17	part/full bed	ds	30	run	run	100	RB low flow bank
18	part/full bed	ds	30	run	run	100	RB low flow bank
19	part veg/bank	ds	30	run	run	100	RB low flow bank
20	part veg/bank	ds	30	run	run	100	RB low flow bank
21	part veg/bank	ds	30	run	run	100	RB low flow bank
22	part veg/bank	ds	30	riffle	riffle	100	RB low flow bank
23	fully w/veg	ds	30	riffle	riffle	100	RB low flow bank
24	fully w/veg	ds	30	riffle	riffle	100	RB low flow bank
25	part/full bed	ds	30	riffle	run	50	LB low flow bank
26	part/full bed	ds	30	riffle	run	50	LB low flow bank
27	part/full bed	ds	30	run	run	50	LB low flow bank
28	part/full bed	ds	30	run	run	50	LB low flow bank
29	part/full bed	ds	30	run	run	50	LB low flow bank
30	part/full bed	ds	30	run	run	50	LB low flow bank
31	part/full bed	ds	30	run	run	50	LB low flow bank
32	part veg/bank	ds	30	run	run	50	LB low flow bank
33	part veg/bank	ds	30	pool	pool	20	RB low flow bank
34	part/full bed	pf	NA	riffle	riffle	50	LB bankfull bank
35	part veg/bank	unknown	unknown	riffle	riffle	50	LB floodplain/bench
41	part veg/bank	NA	NA	pool	run	100	RB low flow bank

42	part veg/bank	us	30	pool	us	run	unknown	RB low flow bank
43	part veg/bank	us	30	pool	us	run	unknown	RB low flow bank
44	part veg/bank	us	30	pool	us	pool	unknown	RB low flow bank
45	part veg/bank	ds	<30	pool	us	run	100	LB low flow bank
46	no embed	ds	30	pool	us	run	100	LB low flow bank
47	no embed	unknown	unknown	pool	us	run	100	LB low flow bank
48	no embed	unknown	unknown	pool	us	run	100	LB low flow bank
49	part veg/bank	ds	<30	pool	us	pool	50	LB bankfull bank
50	part/full bed	ds	30	pool	us	pool	50	LB low flow bank
51	part/full bed	ds	<30	pool	us	pool	50	LB low flow bank
52	part veg/bank	NA	NA	run	us	run	100	LB bankfull bank
53	part veg/bank	NA	NA	pool	us	pool	50	LB low flow bank
54	part/full bed	us	<30	pool	us	pool	50	RB low flow bank
36	part veg/bank	NA	NA	pool	us	pool	50	RB low flow bank
37	part veg/bank	pf	NA	run	us	run	20	LB low flow bank
38	part veg/bank	ds	>30	pool	us	run	100	RB bankfull bank
39	part veg/bank	pf	NA	pool	us	pool	20	LB low flow bank
40	part veg/bank	pf	NA	pool	us	pool	20	LB low flow bank
55	part veg/bank	pf	NA	pool	us	pool	50	RB bankfull bank
56	part veg/bank	ds	<30	riffle	us	riffle	50	LB bankfull bank
57	part veg/bank	ds	<30	run	us	run	100	LB low flow bank
58	part veg/bank	pf	NA	pool	us	pool	50	RB bankfull bank

Downstream Schulte to Quail Lodge Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
10	sand	unknown	Stlhd/Stcklbk	jack	NA	no	
11	sand	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
12	sand	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
13	sand	unknown	Stlhd/Stcklbk/Frg?	cut/placed	NA	no	
14	sand	unknown	Stlhd/Stcklbk/Frg?	cut/placed	NA	no	
15	sand	unknown	Stlhd/Stcklbk/Frg?	cut/placed	NA	no	
16	sand	unknown	Stlhd/Stcklbk/Frg?	cut/placed	NA	no	
17	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
18	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
19	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
20	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
21	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
22	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
23	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
24	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
25	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
26	cobble	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
27	gravel	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
28	gravel	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
29	gravel	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
30	gravel	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
31	gravel	unknown	Stlhd/Stcklbk	cut/placed	NA	no	
32	gravel	unknown	Stlhd/Stcklbk		NA	no	

33	sand	unknown	Stlhd/Stcklbk		NA	no	
34	sand	unknown	none detected		NA	no	
35	sand	unknown	none detected		NA	no	
41	cobble	unknown	Stlhd/Stcklbk/Cryfsh		2 x 10	no	
42	cobble	unknown	Stlhd/Stcklbk/Cryfsh	cut/placed	NA	no	
43	cobble	unknown	Stlhd/Stcklbk/Cryfsh	cut/placed	NA	no	
44	cobble	unknown	Stlhd/Stcklbk/Cryfsh	cut/placed	NA	no	
45	sand	unknown	Stlhd/Stcklbk/Cryfsh		NA	no	
46	cobble	unknown	none detected		NA	no	
47	cobble	unknown	none detected		NA	no	
48	cobble	unknown	none detected		NA	no	
49	sand	unknown	none detected		NA	no	
50	cobble	unknown	Stlhd/Stcklbk		NA	no	
51	cobble	unknown	Stlhd/Stcklbk		NA	no	
52	sand	unknown	none detected		4 x 6	no	
53	cobble	unknown	Stlhd/Stcklbk		3 x 8	no	
54	cobble	unknown	Stlhd/Stcklbk		NA		
36	cobble	unknown	Stlhd/Stcklbk	jack	3 x 3		
37	sand	unknown	Stlhd/Stcklbk				
38	sand	unknown	Stlhd/Stcklbk	freshly fallen			
39	cobble	unknown	Stlhd/Stcklbk				
40	cobble	unknown	Stlhd/Stcklbk				
55	sand	unknown	none detected				
56	cobble	cottonwood	none detected				
57	gravel	cottonwood	Stlhd/Stcklbk	freshly fallen			
58	sand	unknown	none detected				

Quail Lodge to Via Mallorca Reach of the Carmel River						July 27, 2003	
PT#	LOG_TYPE	WIDTH(CM)	LENGTH(M)	#PIECES	MOBILITY	INFLUENCE	CONDITION
1	multiple w/rb	15-30	2	4	veg/bank moves	bed scour/protect bnk	little/no decomp
2	single w/rb	15-30	2	NA	when bed moves	bed scour	part decomp
3	single	15-30	3	NA	highly mobile	none detected	part decomp
4	single	30-45	1.5	NA	when bed moves	bed scour	part decomp
5	single w/rb	15-30	1.5	NA	veg/bank moves	none detected	little/no decomp
6	single	30-45	4	NA	veg/bank moves	none detected	little/no decomp
7	single	45-60	1.5	NA	veg/bank moves	none detected	little/no decomp
8	single	15-30	7.5	NA	veg/bank moves	none detected	part decomp
9	single	45-60	3.5	NA	veg/bank moves	protecting bank	part decomp
10	single	15-30	4	NA	when bed moves	none detected	signif decomp
11	single	30-45	5	NA	veg/bank moves	none detected	part decomp
12	single	15-30	3	NA	veg/bank moves	protecting bank	part decomp
13	rootball	80	4	NA	veg/bank moves	none detected	part decomp
14	single	15-30	3	NA	when bed moves	bed scour	part decomp
15	single	30-45	3	NA	veg/bank moves	none detected	signif decomp
16	single w/rb	30-45	10	NA	veg/bank moves	none detected	part decomp
17	multiple w/rb	15-30	4	3	veg/bank moves	bed scour/protect bnk	part decomp
18	single	30	20	NA	veg/bank moves	protecting bank	part decomp

19	single	30-45	7	NA	veg/bank moves	protecting bank	part decomp
20	single	30-45	12	NA	when bed moves	protecting bank	live
21	single	15-30	4	NA	highly mobile	bed scour	part decomp
22	single	15-30	5	NA	veg/bank moves	protecting bank	part decomp
23	multiple w/rb	30	5	5	veg/bank moves	protecting bank	part decomp
24	single	45-60	2	NA	highest flows	protecting bank	signif decomp
25	single w/rb	15-30	3	NA	veg/bank moves	protecting bank	part decomp
26	single	50	1.5	NA	highly mobile	none detected	signif decomp
27	multiple w/rb	45	10	4	veg/bank moves	bed scour	part decomp
28	single	30	2	NA	highly mobile	none detected	little/no decomp
29	single	30-45	3	NA	veg/bank moves	none detected	part decomp
30	single	60	15	NA	highest flows	none detected	part decomp
31	single	30	12	NA	veg/bank moves	protecting bank	part decomp
32	single	30-45	12	NA	veg/bank moves	none detected	part decomp
33	single w/rb	45-60	15	NA	when bed moves	protecting bank	part decomp
34	single	30	3	NA	highly mobile	none detected	part decomp
35	single w/rb	60	20	NA	highest flows	protecting bank	part decomp
36	single	45	8	NA	veg/bank moves	protecting bank	live
37	single	30	8	NA	veg/bank moves	none detected	part decomp
38	multiple	30	5	unknown	veg/bank moves	bed scour	part decomp
39	single	15	5	NA	veg/bank moves	none detected	live
40	multiple	45	7	3	veg/bank moves	protecting bank	part decomp
41	multiple w/rb	45	5	5	when bed moves	bed scour/protect bnk	part decomp
42	single	45	2	NA	when bed moves	bed scour	part decomp
43	single	60	1.5	NA	when bed moves	bed scour	part decomp

Quail Lodge to Via Mallorca Reach of the Carmel River (continued)							
PT#	EMBEDMENT	ORIENTATION	DEG_OFF_BNK	REACH_TYPE	PROJECTED	REACH(M)	PART_CHNEL
1	part veg/bank	NA	NA	run	run	300+	LB low flow bank
2	no embed	pf	NA	run	run	300+	LB low flow bank
3	no embed	pf	NA	run	run	300+	RB low flow bank
4	no embed	ds	>30	run	run	300+	LB low flow bank
5	part veg/bank	ds	30	run	run	300+	LB low flow bank
6	part veg/bank	us	<30	run	run	300+	RB low flow bank
7	no embed	ds	>30	run	run	300+	RB low flow bank
8	part veg/bank	ds	<30	run	run	100	RB low flow bank
9	part veg/bank	ds	<30	pool	pool	50	RB low flow bank
10	part/full bed	us	<30	run	run	100	LB low flow bank
11	part veg/bank	ds	30	run	run	100	LB bankfull bank
12	fully w/veg	pf	NA	run	run	100	RB low flow bank
13	part veg/bank	NA	NA	pool	run	100	RB low flow bank
14	part/full bed	pf	NA	glide	glide	20	LB low flow bank
15	part veg/bank	ds	<30	glide	glide	20	LB low flow bank
16	part veg/bank	ds	30	pool	pool	20	RB low flow bank
17	fully w/veg	NA	NA	pool	pool	10	LB low flow bank
18	part veg/bank	pf	NA	run	run	100	LB low flow bank
19	part veg/bank	pf	NA	run	run	50	RB low flow bank

20	no embed	ds	<30	run	run	50	LB low flow bank
21	no embed	pf	NA	run	run	50	RB low flow bank
22	part veg/bank	ds	>30	pool	pool	10	LB low flow bank
23	fully w/veg	NA	NA	pool	pool	15	LB low flow bank
24	fully w/veg	ds	<30	riffle	riffle	10	LB low flow bank
25	part veg/bank	pf	NA	pool	pool	10	RB low flow bank
26	no embed	pf	NA	riffle	riffle	20	RB bankfull bank
27	part veg/bank	NA	NA	pool	pool	15	LB low flow bank
28	no embed	pf	NA	run	run	50	RB bankfull bank
29	part veg/bank	pf	NA	run	run	50	RB bankfull bank
30	no embed	perp	90	riffle	riffle	5	RB floodplain/bench
31	part veg/bank	pf	NA	run	run	50	LB bankfull bank
32	no embed	ds	<30	run	run	50	RB low flow bank
33	part/full bed	pf	NA	run	run	50	LB bankfull bank
34	no embed	us	<30	pool	pool	25	LB low flow bank
35	part veg/bank	pf	NA	run	run	50	RB bankfull bank
36	part veg/bank	ds	<30	pool	pool	50	LB low flow bank
37	part veg/bank	ds	<30	pool	pool	50	LB low flow bank
38	part veg/bank	NA	NA	pool	pool	50	LB low flow bank
39	no embed	ds	30	pool	pool	30	RB low flow bank
40	part veg/bank	NA	NA	pool	pool	20	RB low flow bank
41	part veg/bank	NA	NA	run	run	20	LB floodplain/bench
42	part/full bed	perp	90	run	run	100	RB low flow bank
43	part/full bed	pf	NA	run	run	100	LB low flow bank

Quail Lodge to Via Mallorca Reach of the Carmel River (continued)							
PT#	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC_SIZE	IMAGE	TAGGED
1	cobble	unknown	Stcklbk	under Quail Bridge	2 x 3	no	
2	gravel	unknown	Stlhd/Stcklbk	under Quail Bridge	NA	no	
3	sand	unknown	Stlhd/Stcklbk		NA	no	
4	gravel	unknown	Stlhd/Stcklbk		NA	no	
5	cobble	cottonwood	none detected	freshly fallen (50% low flow)	NA	no	
6	gravel	unknown	Stcklbk	freshly fallen (50% low flow)	NA	no	
7	cobble	unknown	Stlhd/Stcklbk	cut/stubby	NA	no	
8	cobble	unknown	none detected		NA	no	
9	cobble	unknown	Stcklbk		NA	no	
10	sand	unknown	Stcklbk		NA	no	
11	sand	unknown	none detected		NA	no	
12	sand	unknown	Stlhd/Stcklbk		NA	no	
13	sand	unknown	Stlhd/Stcklbk		NA	no	
14	gravel	unknown	Stlhd/Stcklbk		NA	no	
15	sand	unknown	Stlhd/Stcklbk		NA	no	
16	sand	unknown	Stlhd/Stcklbk		NA	no	
17	gravel	unknown	Stlhd/Stcklbk	very evident scour/fish pop.	2 x 5	no	
18	sand	unknown	Stlhd/Stcklbk		NA	no	
19	sand	unknown	Stlhd/Stcklbk		NA	no	
20	sand	willow	Stlhd/Stcklbk		NA	no	
21	sand	unknown	Stlhd/Stcklbk		NA	no	

Carmel Large Woody Debris (2003)

22	cobble	willow	Stlhd/Stcklbk		NA	no	
23	gravel	unknown	Stlhd/Stcklbk		2 x 8	no	
24	cobble	unknown	Stlhd/Stcklbk		NA	no	
25	sand	willow	Stlhd/Stcklbk		NA	no	
26	sand	unknown	none detected		NA	no	
27	cobble	willow	Stlhd/Stcklbk		4 x 12	no	
28	sand	unknown	Stlhd/Stcklbk		NA	no	
29	cobble	unknown	Stlhd/Stcklbk		NA	no	
30	sand	cottonwood	Stcklbk		NA	no	
31	sand	unknown	none detected		NA	no	
32	gravel	unknown	Stlhd/Stcklbk		NA	no	
33	sand	cottonwood	Stlhd/Stcklbk		NA	no	
34	gravel	unknown	Stlhd/Stcklbk		NA	no	
35	sand	unknown	Stlhd/Stcklbk	large piece/ bank support	NA	no	
36	gravel	unknown	Stlhd/Stcklbk	cut at low flow point	NA	no	
37	sand	unknown	Stcklbk		NA	no	
38	gravel	unknown	Stcklbk		2 x 8	no	
39	sand	cottonwood	Stcklbk		NA	no	
40	sand	willow	Stlhd/Stcklbk		2 x 12	no	
41	sand	unknown	none detected		5 x 10	no	
42	gravel	unknown	none detected	under bridge	NA	no	
43	gravel	unknown	Stcklbk		NA	no	

11 Appendix D: 2002 Data Tables (Via Mallorca to Lagoon)

Via Mallorca along Rancho Cañada Reach of the Carmel River (continued)							Nov. 18, 2002
Pt #	LOG TYPE	WIDTH(CM)	LENGTH(M)	# PIECES	MOBILITY	INFLUENCE	CONDITION
1	single	30-45	1.5-3	N/A	when bed moves	none detected	little/no decomp
2	single	15-30	3-4.5	N/A	highly mobile	none detected	little/no decomp
3	single	30-45	1.5-3	N/A	when bed moves	none detected	little/no decomp
4	single	60-75	1.5-3	N/A	when bed moves	none detected	little/no decomp
5	single	30-45	15-16.5	N/A	veg/bank moves	none detected	little/no decomp
6	single	30-45	6-7.5	N/A	highest flows	none detected	live
7	single w/rb	60-75	1.5-3	N/A	highest flows	none detected	part decomp
8	single	75-90	3-4.5	N/A	highest flows	none detected	little/no decomp
9	multiple w/rb	60-75	3-4.5	2	when bed moves	bed scour	live
10	single	15-30	1.5-3	N/A	highest flows	none detected	part decomp
11	single	15-30	1.5-3	N/A	highest flows	none detected	part decomp
12	single	30-45	3-4.5	N/A	veg/bank moves	none detected	part decomp
13	single	15-30	3-4.5	N/A	veg/bank moves	none detected	little/no decomp
14	single w/rb	30-45	9-10.5	N/A	highest flows	none detected	little/no decomp
15	single w/rb	30-45	3-4.5	N/A	when bed moves	none detected	little/no decomp
16	multiple w/rb	unknown	unknown	10+	veg/bank moves	none detected	part decomp
17	single w/rb	unknown	unknown	N/A	highly mobile	none detected	little/no decomp
18	multiple w/rb	30-45	7.5-9	5	highest flows	bed scour	part decomp
19	single	30-45	3-4.5	N/A	highly mobile	none detected	signif decomp
20	single	15-30	9-10.5	N/A	veg/bank moves	none detected	part decomp
21	single w/rb	15-30	1.5-3	N/A	when bed moves	protect bank	part decomp
22	single w/rb	100+	9-10.5	N/A	highest flows	protect bank	part decomp
23	single	15-30	9-10.5	N/A	veg/bank moves	protect bank	part decomp
24	single	15-30	1.5-3	N/A	when bed moves	none detected	part decomp
25	multiple	15-30	3-4.5	4	veg/bank moves	none detected	part decomp
26	multiple	15-30	7.5-9	10+	veg/bank moves	none detected	signif decomp
27	single w/rb	15-30	1.5-3	N/A	when bed moves	none detected	part decomp
28	single w/rb	60-75	6-7.5	N/A	highest flows	none detected	part decomp
29	single	60-75	4.5-6	N/A	veg/bank moves	none detected	part decomp
30	single	60-75	4.5-6	N/A	highest flows	protect bank	signif decomp
31	multiple	30-45	15	unknown	highest flows	bed scour	little/no decomp
32	multiple	30-45	10	unknown	veg/bank moves	none detected	part decomp

Via Mallorca along Rancho Cañada Reach of the Carmel River (continued)						
Pt #	EMBEDMENT	ORIENTATION	DEG OFF BANK	REACH_TYPE	PROJECTED(200CFS)	REACH LENGTH (M)
1	part/full bed	pf	0	run	run	300+
2	no embed	perp	90	run	run	300+
3	part/full bed	pf	0	run	run	300+
4	part/full bed	perp	90	run	run	300+
5	part veg/bank	ds	<30	run	run	300+
6	part veg/bank	pf	0	run	run	300+
7	part veg/bank	pf	0	run	run	300+
8	part veg/bank	pf	0	run	run	300+

9	part/full bed	N/A	N/A	run	run	300+
10	part/full bed	perp	90	run	run	300+
11	part/full bed	perp	90	run	run	300+
12	no embed	ds	30	run	run	300+
13	part veg/bank	ds	30	run	run	300+
14	no embed	pf	0	run	run	300+
15	no embed	pf	0	run	run	300+
16	no embed	N/A	N/A	run	run	300+
17	no embed	ds	>30	run	run	300+
18	part veg/bank	N/A	N/A	run	run	300+
19	no embed	us	>30	run	run	300+
20	part veg/bank	ds	<30	run	run	300+
21	part/full bed	ds	>30	run	run	300+
22	part veg/bank	ds	<30	run	run	300+
23	part veg/bank	pf	0	run	run	300+
24	part/full bed	pf	0	run	run	300+
25	part veg/bank	N/A	N/A	run	run	300+
26	part veg/bank	N/A	N/A	run	run	300+
27	part/full bed	ds	>30	run	run	300+
28	no embed	us	>30	run	run	300+
29	part veg/bank	pf	0	run	run	300+
30	part veg/bank	ds	>30	run	run	300+
31	part veg/bank	N/A	N/A	run	run	300+
32	part veg/bank	N/A	N/A	run	run	300+

Via Mallorca along Rancho Cañada Reach of the Carmel River (continued)						
Pt #	PART OF CHANNEL	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC SIZE(M)
1	center	cobble	unknown	none	dry, undr brdg	N/A
2	center	cobble	unknown	none	dry, undr brdg east	N/A
3	center	cobble	unknown	none	dry, undr brdg west	N/A
4	center	cobble	unknown	none	dry, undr brdg east	N/A
5	LB bankfull streambank	sand	cottonwood	none	dry, cut	N/A
6	LB bankfull streambank	sand	willow	none	dry, cut	N/A
7	LB bankfull streambank	sand	willow	none	dry, cut	N/A
8	LB bankfull streambank	sand	unknown	none	dry	N/A
9	RB low flow bank	sand	willow	none	dry, sprouts, 45 ds	2 x 4
10	LB bankfull streambank	sand	unknown	none	dry	N/A
11	LB bankfull streambank	sand	unknown	none	dry	N/A
12	LB bankfull streambank	sand	unknown	none	dry	N/A
13	LB low flow bank	sand	willow	none	dry	N/A
14	RB floodplain/bench	sand	unknown	none	dry	N/A
15	center	sand	unknown	none	dry	N/A
16	LB bankfull streambank	sand	unknown	none	dry, undr brdg, human	10 x 15
17	LB low flow bank	sand	unknown	none	dry, small logs	N/A
18	RB low flow bank	sand	unknown	none	dry, ds 80 deg	3 x 12
19	RB floodplain/bench	sand	unknown	none	dry	N/A
20	LB bankfull streambank	sand	unknown	none	dry	N/A

21	RB low flow bank	sand	unknown	none	dry	N/A
22	LB bankfull streambank	sand	unknown	none	dry, lrg rootball, cut	N/A
23	LB low flow bank	sand	willow	none	dry	N/A
24	LB low flow bank	sand	willow	none	dry	N/A
25	LB low flow bank	sand	unknown	none	dry	3 x 6
26	RB bankfull streambank	sand	unknown	none	dry	2 x 15
27	LB low flow bank	sand	alder	none	dry, little pieces	N/A
28	LB floodplain/bench	sand	willow	none	dry, bank erosion	N/A
29	LB bankfull streambank	sand	unknown	none	dry, cut	N/A
30	LB bankfull streambank	sand	unknown	none	dry	N/A
31	LB floodplain/bench	sand	unknown	none		unknown
32	LB bankfull streambank	sand	unknown	none		10 x 20 m

Rancho Cañada to Head of Lagoon Reach of the Carmel River (continued)							Nov. 4, 2002
Pt #	LOG TYPE	WIDTH(CM)	LENGTH(M)	# PIECES	MOBILITY	INFLUENCE	CONDITION
1	single w/rb	60-75	10.5-12	N/A	highest flows	protect bank	part decomp
2	multiple	30-45	6-7.5	2	highest flows	scour bank	little/no decomp
3	single	60-75	9-10.5	N/A	highest flows	scour bank	part decomp
4	multiple	30-45	7.5-9	2	highest flows	protect bank	part decomp
5	single	60-75	9-10.5	N/A	highest flows	protect bank	part decomp
6	multiple w/rb	30-45	7.5-9	3	highest flows	bed scour	part decomp
7	single	60-75	6-7.5	N/A	highest flows	protect bank	part decomp
8	single	30-45	4.5-6	N/A	when bed moves	scour bank	part decomp
9	single	30-45	15-16.5	N/A	highest flows	protect bank	part decomp
10	single	15-30	6-7.5	N/A	veg/bank moves	scour bank	little/no decomp
11	single	30-45	9-10.5	N/A	veg/bank moves	protect bank	part decomp
12	single	45-60	9-10.5	N/A	veg/bank moves	scour bank	little/no decomp
13	multiple	15-30	4.5-6	6+	veg/bank moves	none detected	part decomp
14	single	30-45	9-10.5	N/A	veg/bank moves	bed scour	little/no decomp
15	single	15-30	4.5-6	N/A	highly mobile	none detected	little/no decomp
16	multiple	30-45	4.5-6	3	veg/bank moves	bed scour	part decomp
17	multiple	15-30	3-4.5	3	veg/bank moves	bed scour	part decomp
18	multiple	15-30	4.5-6	6+	veg/bank moves	bed scour	part decomp
19	single	30-45	4.5-6	N/A	when bed moves	bed scour	part decomp
20	single	15-30	3-4.5	N/A	when bed moves	bed scour	part decomp
21	multiple	15-30	7.5-9	3	veg/bank moves	bed scour	part decomp

Rancho Cañada to Head of Lagoon Reach of the Carmel River (continued)						
Pt #	EMBEDMENT	ORIENTATION	DEG OFF BANK	REACH_TYPE	PROJECTED(200CFS)	REACH LENGTH (M)
1	fully w/veg	pf	0	run	run	100+
2	part veg/bank	N/A	N/A	run	run	100+
3	part veg/bank	ds	>30	run	run	100+
4	fully w/veg	N/A	N/A	run	run	100+
5	part veg/bank	pf	0	run	run	100+
6	part veg/bank	N/A	N/A	run	run	100+
7	fully w/veg	ds	<30	run	run	100+
8	part/full bed	ds	<30	run	run	100+

9	fully w/veg	N/A	N/A	run	run	100+
10	part veg/bank	N/A	N/A	run	run	100+
11	part veg/bank	N/A	N/A	run	run	100+
12	part veg/bank	N/A	N/A	run	run	50+
13	part veg/bank	N/A	N/A	run	run	100+
14	part/full bed	N/A	N/A	run	run	100+
15	no embed	N/A	N/A	run	run	100+
16	part veg/bank	N/A	N/A	run	run	100+
17	part veg/bank	N/A	N/A	run	run	100+
18	part veg/bank	N/A	N/A	run	run	100+
19	no embed	N/A	N/A	run	run	100+
20	part/full bed	N/A	N/A	run	run	100+
21	part veg/bank	N/A	N/A	run	run	100+

Rancho Cañada to Head of Lagoon Reach of the Carmel River (continued)						
Pt #	PART OF CHANNEL	SUBSTRATE	SPECIES	FAUNA	COMMENTS	STRUC SIZE(M)
1	LB bankfull streambank	sand	unknown	none		N/A
2	LB bankfull streambank	sand	willow	none		2 x 10
3	RB bankfull streambank	sand	sycamore	none		N/A
4	LB bankfull streambank	sand	willow	none	dry	3 x 10
5	RB bankfull streambank	sand	unknown	none	dry	N/A
6	LB low flow bank	sand	unknown	none	dry	3 x 10
7	RB bankfull streambank	sand	unknown	none	dry	N/A
8	RB low flow bank	sand	unknown	none		N/A
9	LB low flow bank	sand	unknown	none		N/A
10	RB low flow bank	sand	willow	none		N/A
11	LB low flow bank	sand	unknown	none		N/A
12	LB bankfull streambank	sand	cottonwood	none		N/A
13	LB low flow bank	sand	unknown	none		3 x 10
14	LB low flow bank	sand	cottonwood	none		N/A
15	LB low flow bank	sand	cottonwood	none		N/A
16	LB low flow bank	sand	cottonwood	none		2 x 8
17	RB low flow bank	sand	unknown	none		2 x 8
18	RB low flow bank	sand	unknown	none		2 x 10
19	RB low flow bank	sand	unknown	none		N/A
20	RB low flow bank	sand	unknown	none		N/A
21	RB low flow bank	sand	unknown	none		2 x 10

12 Appendix E: List of tagged LWD

DATE/LOCAT (2003)	PT#	LOG_TYPE	WIDTH(CM)	LENGT H(M)	#PIECES	STRUC_SIZE (LxWxH)	TAGGED	PHOTO
10/07 Stn Pine-Lowr Circle	15	multiple w/rb	30	3	7	5 x 5 x 2	C05	x
10/07 Stn Pine-Lowr Circle	17	single	15-45	5	NA	NA	C03	x
10/07 Stn Pine-Lowr Circle	19	multiple w/rb	30-45	3	5	4 x 5 x 3	C04?	x
10/07 Stn Pine-Lowr Circle	27	rootball	2 (m)	2	NA	NA	C02	x
10/07 Stn Pine-Lowr Circle	29	single	15-30	4	NA	NA	C01	x
10/07 Stn Pine-Lowr Circle	35	single w/rb	15-30	4	NA	NA	C06	x
10/5 Rosie's Brdge-DeDampierre	2	single	30	3	NA	NA	C07	x
10/5 Rosie's Brdge-DeDampierre	3	single	15-30	8	NA	NA	C08	x
10/5 Rosie's Brdge-DeDampierre	16	single	15-30	4	NA	NA	C10	x
10/5 Rosie's Brdge-DeDampierre	19	multiple	15	2	3	3 x 2 x 2	C11	x
10/5 Rosie's Brdge-DeDampierre	21	single w/rb	15	5	NA	NA	C12	x
10/5 Rosie's Brdge-DeDampierre	26	single	15-30	5	NA	NA	C13	x
10/9 Upstrm Schulte-Dwnstrm Schulte	8	multiple w/rb	15-30	4	2	10 x 1 x 1	B34/B35	x/x
10/9 Upstrm Schulte-Dwnstrm Schulte	12	single	15	3	NA	NA	B36	x
10/9 Upstrm Schulte-Dwnstrm Schulte	14	single w/rb	15-30	4	NA	NA	B37	x
10/9 Upstrm Schulte-Dwnstrm Schulte	16	single	15	4	NA	NA	B38	x
8/10 Robinson- Upstrm Schulte	1	single	30		2	NA	B33	x
8/10 Robinson- Upstrm Schulte	3	multiple	45		5	7 x 15	B31	
8/21 GrInd Views-GrInd Prk	4	single w/rb	45	10	NA	NA	C18	x
8/31 Boronda-Garland Stables	5	single	15	5	NA	NA	C16	x
9/14 DeDampierre-Saddle Club	7	single w/rb	60	8	NA	NA	C15	x
9/14 DeDampierre-Saddle Club	8	single w/rb	150	15	NA	NA	C14	x
9/27 Scarlet-Robinson	22	single	45-60	5	NA	NA	B30	x
Garland Park-Narrows	1	single	15	3.5	NA		C20	
Garland Park-Narrows	3	single	15-30	1.5	NA		C21	
Garland Park-Narrows	4	single	15-30	3	NA		C22 (C23)?	
							C17	

13 Appendix F: List of Photographed LWD

DATE/LOCAT (2003)	PT#	LOG_TYPE	WID(CM)	LENGTH(M)	#PIECES	STRUC_SIZE (m)	TAG
9/07 Stne Pine_Slpy Hollw	1	see image	see image	see image	see image	NA	
9/07 Stne Pine_Slpy Hollw	2	see image	see image	see image	see image	unknown	
9/07 Stne Pine_Slpy Hollw	3	single w/rb	45	4	NA	NA	
9/07 Stne Pine_Slpy Hollw	4	single	45-60	10	NA	NA	
9/07 Stne Pine_Slpy Hollw	5	multiple	15	2	>10	6 x 2 x 3	
9/07 Stne Pine_Slpy Hollw	6	single	60	4	NA	NA	
9/07 Stne Pine_Slpy Hollw	7	multiple	15	2	>10	10 x 3 x 3	
9/07 Stne Pine_Slpy Hollw	8	multiple	15	1	4	5 x 2 x 1	
9/07 Stne Pine_Slpy Hollw	10	multiple	15	2	>10	20 x 10 x 1	
10/07 Stn Pine-Lowr Circle	7	multiple w/rb	15-30	2	>10	8 x 5 x 2	
10/07 Stn Pine-Lowr Circle	9	single	15-30	5	NA	NA	
10/07 Stn Pine-Lowr Circle	13	multiple	30	3	>10	8 x 6 x 2	
10/07 Stn Pine-Lowr Circle	15	multiple w/rb	30	3	7	5 x 5 x 2	C05
10/07 Stn Pine-Lowr Circle	17	single	15-45	5	NA	NA	C03
10/07 Stn Pine-Lowr Circle	18	single w/rb	15-30	4	NA	NA	
10/07 Stn Pine-Lowr Circle	19	multiple w/rb	30-45	3	5	4 x 5 x 3	C04?
10/07 Stn Pine-Lowr Circle	21	single	15-30	5	NA	NA	
10/07 Stn Pine-Lowr Circle	27	rootball	2 (m)	2	NA	NA	C02
10/07 Stn Pine-Lowr Circle	29	single	15-30	4	NA	NA	C01
10/07 Stn Pine-Lowr Circle	32	single w/rb	15	3	unknown	NA	
10/07 Stn Pine-Lowr Circle	33	single w/rb	15-30	4	unknown	NA	
10/07 Stn Pine-Lowr Circle	35	single w/rb	15-30	4	NA	NA	C06
10/07 Stn Pine-Lowr Circle	44	single w/rb	15-45	5	NA	NA	
10/07 Stn Pine-Lowr Circle	54	single	30-45	3	NA	NA	
10/07 Stn Pine-Lowr Circle	60	multiple	15	3	>10	7 x 5 x 1	
10/07 Stn Pine-Lowr Circle	61	multiple	15	3	>10	10 x 5 x 2	
10/07 Stn Pine-Lowr Circle	65	multiple	15-30	2	>10	5 x 5 x 2	
10/5 Rosie's Brdge-DeDampierre	1	single	15-30	4	NA	NA	
10/5 Rosie's Brdge-DeDampierre	2	single	30	3	NA	NA	C07
10/5 Rosie's Brdge-DeDampierre	3	single	15-30	8	NA	NA	C08
10/5 Rosie's Brdge-DeDampierre	5	single	15	3	NA	NA	
10/5 Rosie's Brdge-DeDampierre	6	single w/rb	15-30	5	NA	NA	
10/5 Rosie's Brdge-DeDampierre	9	single w/rb	15-30	2	NA	NA	
10/5 Rosie's Brdge-DeDampierre	11	rootball	2(m)	2	NA	NA	
10/5 Rosie's Brdge-DeDampierre	15	multiple	15	2	5	4 x 4 x 1	
10/5 Rosie's Brdge-DeDampierre	16	single	15-30	4	NA	NA	C10
10/5 Rosie's Brdge-DeDampierre	19	multiple	15	2	3	3 x 2 x 2	C11
10/5 Rosie's Brdge-DeDampierre	23	single w/rb	15	5	NA	NA	
10/5 Rosie's Brdge-DeDampierre	26	single	15-30	5	NA	NA	C13
10/5 Rosie's Brdge-DeDampierre	28	single	15-30	4	NA	NA	
9/14 DeDampierre-Saddle Club	1	single w/rb	60	10	NA	NA	
9/14 DeDampierre-Saddle Club	2	single w/rb	60	10	NA	NA	
9/14 DeDampierre-Saddle Club	3	single w/rb	60	10	NA	NA	
9/14 DeDampierre-Saddle Club	4	single w/rb	60	10	NA	NA	
9/14 DeDampierre-Saddle Club	5	single w/rb	60	10	NA	NA	
9/14 DeDampierre-Saddle Club	7	single w/rb	60	8	NA	NA	C15

9/14 DeDampierre-Saddle Club	8	single w/rb	150	15	NA	NA	C14
9/14 DeDampierre-Saddle Club	12	single w/rb	45-60	10	NA	NA	
8/31 Boronda-Garland Stables	1	single	45	10	NA	NA	
8/31 Boronda-Garland Stables	5	single	15	5	NA	NA	C16
8/31 Boronda-Garland Stables	7	multiple	15	2	3	4 x 2 x 2	
8/31 Boronda-Garland Stables	25	single	15	5	NA	NA	
8/31 Boronda-Garland Stables	28	multiple w/rb	30	3	>10	10 x 5 x 4	
8/21 GrInd Views-GrInd Prk	3	single	30	4	NA	NA	
8/21 GrInd Views-GrInd Prk	4	single w/rb	45	10	NA	NA	C18
8/21 GrInd Views-GrInd Prk	5	single w/rb	30	5	NA	NA	
8/21 GrInd Views-GrInd Prk	9	multiple	30	4	unknown	5 x 2 x 1	
8/21 GrInd Views-GrInd Prk	15	multiple	15	5	4	5 x 2 x 1	
8/21 GrInd Views-GrInd Prk	17	single w/rb	45-60	6	NA	NA	
8/21 GrInd Views-GrInd Prk	22	multiple w/rb	15	1.5	>10	10 x 10 x 6	
8/21 GrInd Views-GrInd Prk	29	multiple w/rb	30	4	4	5 x 2 x 1	
Garland Park-Narrows	2	multiple w/rb	15-30	3	4	5 x 5 x 2	
Garland Park-Narrows	3	single	15-30	1.5	NA		C21
Garland Park-Narrows	16	rootball	30-45	1.5	NA		
Garland Park-Narrows	22	single	15	3	NA		
Garland Park-Narrows	26	single	15	4.5	NA		
Garland Park-Narrows	28	single w/rb	15-30	3	NA		
Garland Park-Narrows	29	multiple w/rb	45-60	2.5	3	5 x 4 x 3	
Garland Park-Narrows	30	multiple	15	3	3	4 x 5 x 1.5	
Garland Park-Narrows	37	single	15	4	NA		
Garland Park-Narrows	41	multiple	15	3	2	5 x 2 x 1	
Garland Park-Narrows	45	single	30	3	NA		
9/19 Narrows-Scarlet	4	single	15	5	NA	NA	
9/19 Narrows-Scarlet	5	single	15	4	NA	NA	
9/19 Narrows-Scarlet	7	single	15	3	NA	NA	
9/19 Narrows-Scarlet	23	single w/rb	30	2	NA	NA	
9/19 Narrows-Scarlet	29	multiple	30	8	NA	5 x 10 x 2	
9/27 Scarlet-Robinson	3	multiple	30-45	3	3	4 x 3 x 1	
9/27 Scarlet-Robinson	6	multiple	15	2.5	3	3 x 3 x 2	
9/27 Scarlet-Robinson	7	multiple w/rb	15	2	>10	10 x 5 x 1	
9/27 Scarlet-Robinson	12	single w/rb	30-45	4	NA	NA	
9/27 Scarlet-Robinson	18	single	15-30	6	NA	NA	
9/27 Scarlet-Robinson	22	single	45-60	5	NA	NA	B30
8/10 Robinson- Upstrm Schulte	1	single	30		2	NA	B33
8/10 Robinson- Upstrm Schulte	3	multiple	45		5	7 x 15	B31
10/9 Upstrm Schulte-Dwnstrm Schulte	1	single w/rb	15	3.5	NA	NA	
10/9 Upstrm Schulte-Dwnstrm Schulte	5	single	15-30	5	NA	NA	
10/9 Upstrm Schulte-Dwnstrm Schulte	7	multiple	15	3	3	4 x 4 x 1	
10/9 Upstrm Schulte-Dwnstrm Schulte	8	multiple w/rb	15-30	4	2	10 x 1 x 1	B34/B 35
10/9 Upstrm Schulte-Dwnstrm Schulte	12	single	15	3	NA	NA	B36
10/9 Upstrm Schulte-Dwnstrm Schulte	13	multiple	15-30	7	3	unknown	
10/9 Upstrm Schulte-Dwnstrm Schulte	14	single w/rb	15-30	4	NA	NA	B37
10/9 Upstrm Schulte-Dwnstrm Schulte	16	single	15	4	NA	NA	B38