STREAM INVENTORY REPORT

Inman Creek

INTRODUCTION

A stream inventory was conducted from July 6 to July 20, 2004 on Inman Creek. The survey began at the confluence with Garcia River and extended upstream 4 miles.

The Inman Creek inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Inman Creek. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for Chinook salmon, coho salmon, and steelhead trout. Recommendations for habitat improvement activities are based upon target habitat values suitable for salmonids in California's north coast streams.

WATERSHED OVERVIEW

Inman Creek is a tributary to Garcia River, which drains to the Pacific Ocean, located in Mendocino County, California (Map 1). Inman Creek's legal description at the confluence with Garcia River is T12N R15W S14. Its location is 38.9072 north latitude and 123.4911 west longitude, LLID 1234912389071. Inman Creek is a second order stream and has approximately 3.8 miles of solid blue line stream and 1.3 miles of dashed blue line stream according to the USGS Zeni Ridge 7.5 minute quadrangle. Inman Creek drains a watershed of approximately 8.49 square miles. Elevations range from about 329 feet at the mouth of the creek to 1,281 feet in the headwater areas. Mixed conifer forest dominates the watershed. The watershed is primarily privately owned and is managed for timber production. Vehicle access exists via Highway 1 to Mountain View Road near the town of Manchester. At approximately 8.3 miles, enter through a Garcia River Forest gate onto Graphite Road. Follow Graphite Road southeast until reaching the mainstem Garcia River. Turn left and follow the main road along Garcia River for approximately 0.9 miles to a dirt parking area on the left bank of the Garcia River. A dirt road leads from this parking area down to the mainstem Garcia River. Cross the Garcia River and follow it downstream until reaching Inman Creek entering on the left bank.

METHODS

The habitat inventory conducted in Inman Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The California Conservation Corps (CCC) members that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). This inventory was conducted by a two-person team.

SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the survey reach. All habitat units included in the survey are classified according to their habitat type and lengths measured. All pool units are measured for maximum depth, depth of pool tail crest (measured in the thalweg), dominant substrate composing the pool tail crest, and embeddedness. Habitat unit types encountered for the first time are measured for all the parameters and characteristics on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for complete measurement. All pools except step-pools are fully sampled.

HABITAT INVENTORY COMPONENTS

A standardized habitat inventory form has been developed for use in California stream surveys and can be found in the *California Salmonid Stream Habitat Restoration Manual*. This form was used in Inman Creek to record measurements and observations. There are eleven components to the inventory form.

1. Flow:

Flow is measured in cubic feet per second (cfs) near the bottom of the stream survey reach using a Marsh-McBirney Model 2000 flow meter.

2. Channel Type:

Channel typing is conducted according to the classification system developed and revised by David Rosgen (1994). This methodology is described in the *California Salmonid Stream Habitat Restoration Manual*. Channel typing is conducted simultaneously with habitat typing and follows a standard form to record measurements and observations. There are five measured parameters used to determine channel type: 1) water slope gradient, 2) entrenchment, 3) width/depth ratio, 4) substrate composition, and 5) sinuosity. Channel characteristics are measured using a clinometer, hand level, hip chain, tape measure, and a stadia rod.

3. Temperatures:

Both water and air temperatures are measured and recorded at every tenth habitat unit. The time of the measurement is also recorded. Both temperatures are taken in degrees Fahrenheit at the middle of the habitat unit and within one foot of the water surface.

4. Habitat Type:

Habitat typing uses the 24 habitat classification types defined by McCain and others (1990). Habitat units are numbered sequentially and assigned a type identification number selected from a standard list of 24 habitat types. Dewatered units are labeled "dry". Inman Creek habitat typing used standard basin level measurement criteria. These parameters require that the minimum length of a described habitat unit must be equal to or greater than the stream's mean

wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Inman Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders or other considerations.

6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide juvenile salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition for prey. The shelter rating is calculated for each fully-described habitat unit by multiplying shelter value and percent cover. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is then classified according to a list of nine cover types. In Inman Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. In all fully-described habitat units, dominant and sub-dominant substrate elements were ocularly estimated using a list of seven size classes and recorded as a one and two, respectively. In addition, the dominant substrate composing the pool tail-outs is recorded for each pool.

8. Canopy:

Stream canopy density was estimated using modified handheld spherical densiometers as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Inman Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the center of approximately every third unit in addition to every fully-described unit, giving an approximate 30% sub-sample. In addition, the area of canopy was estimated ocularly into percentages of coniferous or hardwood trees.

9. Bank Composition and Vegetation:

Bank composition elements range from bedrock to bare soil. However, the stream banks are usually covered with grass, brush, or trees. These factors influence the ability of stream banks to withstand winter flows. In Inman Creek, the dominant composition type and the dominant vegetation type of both the right and left banks for each fully-described unit were selected from

the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was estimated and recorded.

10. Large Woody Debris Count:

Large woody debris (LWD) is an important component of fish habitat and an element in channel forming processes. In each habitat unit all pieces of LWD partially or entirely below the elevation of bankfull discharge are counted and recorded. The minimum size to be considered is twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet.

11. Average Bankfull Width:

Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests (velocity crossovers) are needed to accurately describe reach widths. At the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units), bankfull width is measured and recorded in the appropriate header block of the page. These widths are presented as an average for the channel type reach.

BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. Fish presence was observed from the stream banks in Inman Creek. In addition, three sites were electrofished using a Smith-Root Model 12 electrofisher. These sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual*.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 1.0.37, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Game. This program processes and summarizes the data, and produces the following ten tables:

- Riffle, Flatwater, and Pool Habitat Types
- Habitat Types and Measured Parameters
- Pool Types
- Maximum Residual Pool Depths by Habitat Types
- Mean Percent Cover by Habitat Type
- Dominant Substrates by Habitat Type
- Mean Percent Vegetative Cover for Entire Stream
- Fish Habitat Inventory Data Summary by Stream Reach (Table 8)
- Mean Percent Dominant Substrate / Dominant Vegetation Type for Entire Stream

- Mean Percent Shelter Cover Types for Entire Stream

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Inman Creek include:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence
- Riffle, Flatwater, Pool Habitat Types by Total Length
- Total Habitat Types by Percent Occurrence
- Pool Types by Percent Occurrence
- Maximum Residual Depth in Pools
- Percent Embeddedness
- Mean Percent Cover Types in Pools
- Substrate Composition in Pool Tail-outs
- Mean Percent Canopy
- Dominant Bank Composition by Composition Type
- Dominant Bank Vegetation by Vegetation Type

HABITAT INVENTORY RESULTS

* ALL TABLES AND GRAPHS ARE LOCATED AT THE END OF THE REPORT *

The habitat inventory of July 6 to 20, 2004 was conducted by A. Salyer and S. Thompson (CCC). The total length of the stream surveyed was 21,290 feet with an additional 302 feet of side channel.

Stream flow was measured with a Marsh-McBirney Model 2000 flowmeter at 0.29 cfs on August 5, 2004.

Inman Creek is an F4 channel type for the first 14,197 feet of the stream surveyed (Reach 1), and a G1 channel type for the remaining 7,093 feet of stream surveyed. F4 channel types are entrenched meandering riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. G1 channels are entrenched “gully” step-pool channels on moderate gradients with low width /depth ratios, very stable with bedrock-dominant substrates.

Water temperatures taken during the survey period ranged from 62 to 70 degrees Fahrenheit. Air temperatures ranged from 65 to 85 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 37% flatwater units, 36% pool units, and 26% riffle units (Graph 1). Based on total length of Level II habitat types there were 54% flatwater units, 28% pool units, and 18% riffle (Graph 2).

Sixteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were step run units, 27%; low-gradient riffle units, 22%; and mid-channel pool units, 20% (Graph 3). Based on percent total length, step run units made up 45%, mid-

channel pool units made up 17%, and low-gradient riffle units made up 15%.

A total of 64 pools were identified (Table 3). Main-channel pools were the most frequently encountered, at 66%, and comprised 71% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Sixty of the 64 pools (94%) had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 64 pool tail-outs measured, 45 had a value of 1 (70%); 12 had a value of 2 (19%); 3 had a value of 3 (5%); 4 had a value of 5 (6%) (Graph 6). On this scale, a value of 1 indicates the best spawning conditions and a value of 4 the worst. Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, and boulders.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had a mean shelter rating of 19, flatwater habitat types had a mean shelter rating of 18, and pool habitats had a mean shelter rating of 37 (Table 1). Of the pool types, the scour pools had a mean shelter rating of 52. Main channel pools had a mean shelter rating of 29 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in Inman Creek. Graph 7 describes the pool cover in Inman Creek. Boulders are the dominant pool cover type followed by large woody debris.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was the dominant substrate observed in 70% of the pool tail-outs. Small cobble was the next most frequently observed substrate type and occurred in 19% of the pool tail-outs

The mean percent canopy density for the surveyed length of Inman Creek was 87%. Thirteen percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 74% and 14%, respectively. Graph 9 describes the mean percent canopy in Inman Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 52%. The mean percent left bank vegetated was 57%. The dominant elements composing the structure of the stream banks consisted of 67% sand/silt/clay and 18% cobble/gravel (Graph 10). Hardwood trees were the dominant vegetation type observed in 69% of the units surveyed. Additionally, 28% of the units surveyed had coniferous trees as the dominant vegetation type (Graph 11).

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BIOLOGICAL INVENTORY RESULTS

Salmonids were observed up to 20,001 feet using bank observation methods.

Three sites were electrofished for species composition and distribution in Inman Creek on August 26, 2004. The water temperature taken during the electrofishing period of 1000 to 1130 was 64 degrees Fahrenheit. The air temperature was 65 degrees Fahrenheit. The sites were sampled by S. Thompson, A. Salyer (CCC), and S. Monday (DFG). All aquatic species were identified while lengths were taken of salmonids. Steelhead rainbow trout (SH) were the only salmonid species observed. Other species identified were Sacramento sucker (SKR) and three-spine stickleback (STB) (Table A).

Site 1 yielded four young-of-the-year (YOY) steelhead trout below 70 mm in length.

Site 2 yielded three YOY steelhead trout below 70 mm in length.

Site 3 yielded one YOY steelhead trout below 70 mm in length.

Table A. Inman Creek electrofishing survey data.

Date	Site ID	Species	<70 mm	70-130 mm	>130 mm	Other species
8/26/2004	1	SH	4	0	0	None
8/26/2004	2	SH	3	0	0	None
8/26/2004	3	SH	1	0	0	SKR, STB

DISCUSSION

Inman Creek is an F4 channel type for the first 14,197 feet of stream surveyed and a G1 channel type for the remaining 7,093 feet. The suitability of F4 and G1 channel types for fish habitat improvement structures is as follows: F4 channel types are good for bank-placed boulders and fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover. G1 channel types are fair for log cover.

The water temperatures recorded during the survey ranged from 62 to 70 degrees Fahrenheit. To make any conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling would need to be conducted.

Flatwater habitat types comprised 54% of the total length of this survey, riffles 18%, and pools 28%. Sixty of the 64 (94%) pools had a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In first and second order streams, a primary pool is defined to have a maximum residual depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channels width. Installing structures that will increase or deepen pool habitat is recommended for locations where their installation will not be threatened by high stream energy, or where their installation will not conflict with the modification of the numerous log debris accumulations (LDA's) in the stream.

Fifty-seven of the 64 pool tail-outs measured had embeddedness ratings of 1 or 2. Three of the pool tail-outs had embeddedness ratings of 3 or 4. Four of the pool tail-outs had a rating of 5, which is considered unsuitable for spawning. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead.

Fifty-seven of the 64 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter rating for pools was 37. The shelter rating in the flatwater habitats was 18. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by boulders in Inman Creek. Boulders are the dominant cover type in pools followed by large woody debris. Log and root wad cover structures in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

The mean percent canopy density for the stream was 87%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was moderate at 52% and 57%, respectively. In areas of stream bank erosion or where bank vegetation is sparse, planting endemic species of coniferous and hardwood trees, in conjunction with bank stabilization, is recommended.

RECOMMENDATIONS

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

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

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

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

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

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

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

COMMENTS AND LANDMARKS

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

Position (ft.):	Habitat Unit #:	Comments:
0	0001.00	Start of survey at the confluence with Garcia River.
91	0002.00	Salmonids present.
5870	0043.00	LB, 275 feet into unit.
8626	0061.00	Salmonids present.
8911	0065.00	There is a 200 foot landslide on right bank. Log debris accumulation (LDA) is 25’ wide x 30’ high x 15’ long at the beginning of the unit.
9548	0071.00	Salmonids present.
10559	0080.00	Right bank tributary is North Fork Inman Creek.
13253	0102.00	There is a left bank tributary at the end of the unit.
13551	0104.00	Salmonids present.
14140	0109.00	Channel type change to G1 in this unit.
14616	0114.00	Left bank tributary at the end of the unit.
16134	0126.00	Left bank tributary at the end of the unit.
17093	0133.00	Salmonids present.
17629	0140.00	Salmonids present.

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19067	0150.00	There is an LDA that is 30’ wide x 15’ high x 50’ long approximately 100 feet from beginning of unit.
19203	0151.00	Salmonids present.
19355	0153.00	There is an LDA that is 70’ wide x 6’ high x 100’ long approximately 70 feet into unit.
20001	0161.00	Salmonids present.
21102	0173.00	An unnamed tributary enters 23’ into unit.
21290	0177.00	End of survey due to dry stream.

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LEVEL III and LEVEL IV HABITAT TYPES

RIFFLE			
Low Gradient Riffle	(LGR)	[1.1]	{ 1 }
High Gradient Riffle	(HGR)	[1.2]	{ 2 }
CASCADE			
Cascade	(CAS)	[2.1]	{ 3 }
Bedrock Sheet	(BRS)	[2.2]	{24}
FLATWATER			
Pocket Water	(POW)	[3.1]	{21}
Glide	(GLD)	[3.2]	{14}
Run	(RUN)	[3.3]	{15}
Step Run	(SRN)	[3.4]	{16}
Edgewater	(EDW)	[3.5]	{18}
MAIN CHANNEL POOLS			
Trench Pool	(TRP)	[4.1]	{ 8 }
Mid-Channel Pool	(MCP)	[4.2]	{17}
Channel Confluence Pool	(CCP)	[4.3]	{19}
Step Pool	(STP)	[4.4]	{23}
SCOUR POOLS			
Corner Pool	(CRP)	[5.1]	{22}
Lateral Scour Pool - Log Enhanced	(LSL)	[5.2]	{10}
Lateral Scour Pool - Root Wad Enhanced	(LSR)	[5.3]	{11}
Lateral Scour Pool - Bedrock Formed	(LSBk)	[5.4]	{12}
Lateral Scour Pool - Boulder Formed	(LSBo)	[5.5]	{20}
Plunge Pool	(PLP)	[5.6]	{ 9 }
BACKWATER POOLS			
Secondary Channel Pool	(SCP)	[6.1]	{ 4 }
Backwater Pool - Boulder Formed	(BPB)	[6.2]	{ 5 }
Backwater Pool - Root Wad Formed	(BPR)	[6.3]	{ 6 }
Backwater Pool - Log Formed	(BPL)	[6.4]	{ 7 }
Dammed Pool	(DPL)	[6.5]	{13}
ADDITIONAL UNIT DESIGNATIONS			
Dry	(DRY)	[7.0]	
Culvert	(CUL)	[8.0]	
Not Surveyed	(NS)	[9.0]	
Not Surveyed due to a marsh	(MAR)	[9.1]	

TABLES AND GRAPHS

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Inman Creek Drainage: Garcia River

Survey Dates: 7/6/2004 to 7/20/2004

Confluence Location: Quad: ZENI RIDGE Legal Description: T12NR15WS14 Latitude: 38:54:26.0N Longitude: 123:29:28.0

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Percent Total Length	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
1	0	DRY	0.6	26	26	0.1									
67	7	FLATWATER	37.4	174	11670	54.0	9.1	0.6	1.7	1161	77805	763	51098		18
64	64	POOL	35.8	95	6050	28.0	16.1	1.3	3.0	1540	98572	2353	150615	1764	37
47	7	RIFFLE	26.3	82	3846	17.8	8.3	0.3	1.2	565	26572	211	9907		19

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
179	78	21592	202949.4	211619.5

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Inman Creek Drainage: Garcia River

Survey Dates: 7/6/2004 to 7/20/2004

Confluence Location: Quad: ZENI RIDGE Legal Description: T12NR15WS14 Latitude: 38:54:26.0N Longitude: 123:29:28.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
40	5	LGR	22.3	84	3340	15.5	9	0.3	2.2	631	25253	218	8715		17	84
6	1	HGR	3.4	76	458	2.1	9	0.5	1.8	729	4374	365	2187		10	97
1	1	CAS	0.6	48	48	0.2	5	0.3	1.5	72	72	22	22		40	100
18	1	RUN	10.1	114	2044	9.5	13	1.0	2.8	1521	27378	1521	27378		70	90
49	6	SRN	27.4	196	9626	44.6	8	0.6	2.2	1101	53964	636	31177		9	90
1	1	TRP	0.6	50	50	0.2	14	2.0	3.3	665	665	1530	1530	1330	40	85
36	36	MCP	20.1	101	3620	16.8	16	1.2	4.8	1661	59788	2524	90875	1825	31	88
2	2	CCP	1.1	53	106	0.5	22	1.3	2.7	1158	2316	1712	3425	1417	13	86
3	3	STP	1.7	177	530	2.5	15	1.2	3.2	2526	7578	2649	7948	1838	17	89
6	6	CRP	3.4	62	374	1.7	13	1.6	4.2	797	4782	1501	9006	1350	14	81
2	2	LSL	1.1	89	178	0.8	16	1.2	4.1	1331	2661	1506	3012	796	105	82
3	3	LSR	1.7	48	143	0.7	14	1.5	5.3	600	1801	1066	3199	935	100	76
3	3	LSBk	1.7	83	249	1.2	18	1.5	5.4	1452	4355	3025	9075	2426	112	89
6	6	LSBo	3.4	108	650	3.0	18	1.1	4.2	1848	11087	2635	15813	1990	30	85
2	2	PLP	1.1	75	150	0.7	25	1.4	5.7	1770	3540	3366	6732	2879	20	87
1	0	DRY	0.6	26	26	0.1										83

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
179	78	21592	209613.1	220093.4

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Table 3 - Summary of Pool Types

Stream Name: Inman Creek Drainage: Garcia River
Survey Dates: 7/5/2004 to 7/20/2004
Confluence Location: Quad: ZENI RIDGE Legal Description: T12NR15WS14 Latitude: 38:54:26.0N Longitude: 123:29:28.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid.Vol. (cu.ft.)	Mean Shelter Rating
42	42	MAIN	66	103	4306	71	16.0	1.3	1675	70347	1795	75389	29
22	22	SCOUR	34	79	1744	29	16.5	1.3	1283	28225	1703	37476	52

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
64	64	6050	98572.2	112865

Table 4 - Summary of Maximum Residual Pool Depths By Pool Habitat Types

Stream Name: Inman Creek Drainage: Garcia River
Survey Dates: 7/6/2004 to 7/20/2004
Confluence Location: Quad: ZENI RIDGE Legal Description: T12NR15WS14 Latitude: 38:54:26.0N Longitude: 123:29:28.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
1	TRP	2	0	0	0	0	0	0	1	100	0	0
36	MCP	56	0	0	2	6	22	61	11	31	1	3
2	CCP	3	0	0	0	0	2	100	0	0	0	0
3	STP	5	0	0	0	0	1	33	2	67	0	0
6	CRP	9	0	0	1	17	2	33	2	33	1	17
2	LSL	3	0	0	0	0	1	50	0	0	1	50
3	LSR	5	0	0	0	0	1	33	0	0	2	67
3	LSBk	5	0	0	0	0	1	33	1	33	1	33
6	LSBo	9	0	0	1	17	3	50	1	17	1	17
2	PLP	3	0	0	0	0	0	0	1	50	1	50

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1< 2 Foot Max Resid. Depth	Total 1< 2 Foot % Occurrence	Total 2< 3 Foot Max Resid. Depth	Total 2< 3 Foot % Occurrence	Total 3< 4 Foot Max Resid. Depth	Total 3< 4 Foot % Occurrence	Total >= 4 Foot Max Resid. Depth	Total >= 4 Foot % Occurrence
64	0	0	4	6	33	52	19	30	8	12

Mean Maximum Residual Pool Depth (ft.): 3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Inman Creek | Drainage: Garcia River
Survey Dates: 7/6/2004 to 7/20/2004 | Dry Units: 1
Confluence Location: Quad: ZENI RIDGE | Legal Description: T12NR15WS14 Latitude: 38:54:26.0N Longitude: 123:29:28.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
40	5	LGR	0	0	20	0	1	0	0	19	0
6	1	HGR	0	0	0	0	0	0	0	100	0
1	1	CAS	0	0	0	0	0	0	0	100	0
47	7	TOTAL RIFFLE	0	0	14	0	1	0	0	42	0
18	1	RUN	0	5	0	0	0	0	0	95	0
49	6	SRN	1	3	12	0	8	0	0	44	0
67	7	TOTAL FLAT	1	3	10	0	6	0	0	51	0
1	1	TRP	0	10	30	20	0	0	0	40	0
36	36	MCP	11	5	14	6	3	3	0	38	17
2	2	CCP	50	0	50	0	0	0	0	0	0
3	3	STP	3	5	18	0	5	13	2	50	3
6	6	CRP	20	0	13	0	0	0	0	25	42
2	2	LSL	0	0	95	0	0	5	0	0	0
3	3	LSR	7	3	7	70	0	3	0	10	0
3	3	LSBk	3	3	15	3	0	3	17	27	28
6	6	LSBo	0	3	2	0	3	0	0	67	25
2	2	PLP	0	0	60	5	5	10	0	20	0
64	64	TOTAL POOL	10	4	18	8	2	3	1	36	18
179	78	TOTAL	9	3	17	6	3	2	1	38	14

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Inman Creek | Drainage: Garcia River
Survey Dates: 7/6/2004 to 7/20/2004 | Dry Units: 1
Confluence Location: Quad: ZENI RIDGE | Legal Description: T12NR15WS14 Latitude: 38:54:26.0N Longitude: 123:29:28.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
40	5	LGR	0	0	40	40	20	0	0
6	1	HGR	0	0	0	0	100	0	0
1	1	CAS	0	0	0	0	0	0	100
18	1	RUN	0	0	100	0	0	0	0
49	6	SRN	0	0	50	33	17	0	0
1	1	TRP	0	0	100	0	0	0	0
36	36	MCP	0	19	61	8	8	0	3
2	2	CCP	0	100	0	0	0	0	0
3	3	STP	0	33	33	33	0	0	0
6	6	CRP	0	67	0	17	17	0	0
2	2	LSL	0	50	50	0	0	0	0
3	3	LSR	0	0	67	0	0	0	33
3	3	LSBk	0	0	100	0	0	0	0
6	6	LSBo	0	17	67	0	17	0	0
2	2	PLP	0	50	50	0	0	0	0

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Inman Creek | Drainage: Garcia River

Survey Dates: 7/6/2004 to 7/20/2004 | Survey Length (ft.): 21592 | Main Channel (ft.): 21290 | Side Channel (ft.): 302

Confluence Location: Quad: ZENI RIDGE | Legal Description: T12NR15WS14 | Latitude: 38:54:26.0N | Longitude: 123:29:28.0W

Summary of Fish Habitat Elements By Stream Reach

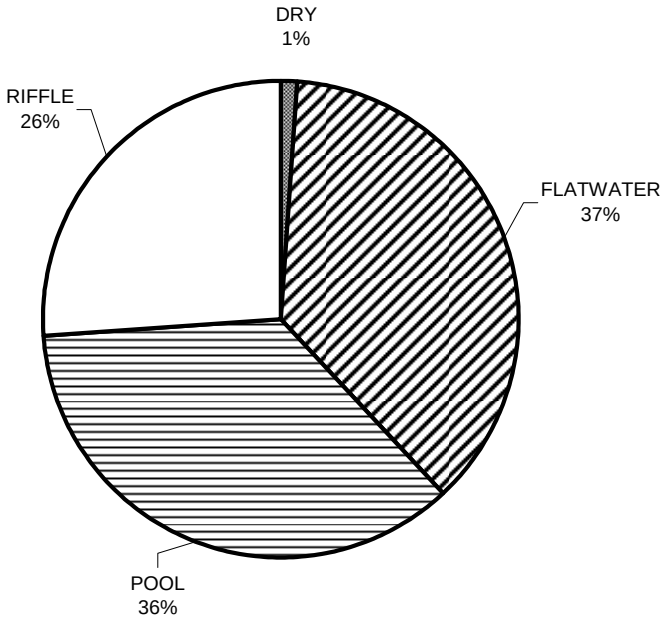
STREAM REACH: 1

Channel Type: F4	Canopy Density (%): 87	Pools by Stream Length (%): 28
Reach Length (ft.): 21290	Coniferous Component (%): 16	Pool Frequency (%): 36
Riffle/Flatwater Mean Width (ft.): 8.7	Deciduous Component (%): 84	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Deciduous Trees	< 2 Feet Deep: 6
Range (ft.): 15 to 44	Vegetative Cover (%): 81	2 to 2.9 Feet Deep: 52
Mean (ft.): 28	Dominant Shelter: Boulders	3 to 3.9 Feet Deep: 30
Std. Dev.: 6	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 12
Base Flow (cfs.): 0.3	Occurrence of LWD (%): 17	Mean Max Residual Pool Depth (ft.): 3.0
Water (F): 62 - 70 Air (F): 65 - 85	LWD per 100 ft.:	Mean Pool Shelter Rating: 37
Dry Channel (ft): 26	Riffles: 1	
	Pools: 1	
	Flat: 0	

Pool Tail Substrate (%): Silt/Clay: 0 Sand: 0 Gravel: 70 Sm Cobble: 19 Lg Cobble: 5 Boulder: 3 Bedrock: 3

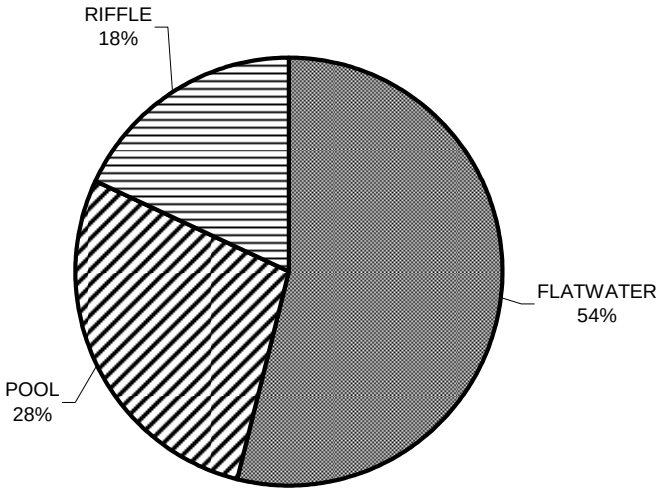
Embeddedness Values (%): 1. 70 2. 19 3. 5 4. 0 5. 6

INMAN CREEK 2004
HABITAT TYPES BY PERCENT OCCURRENCE



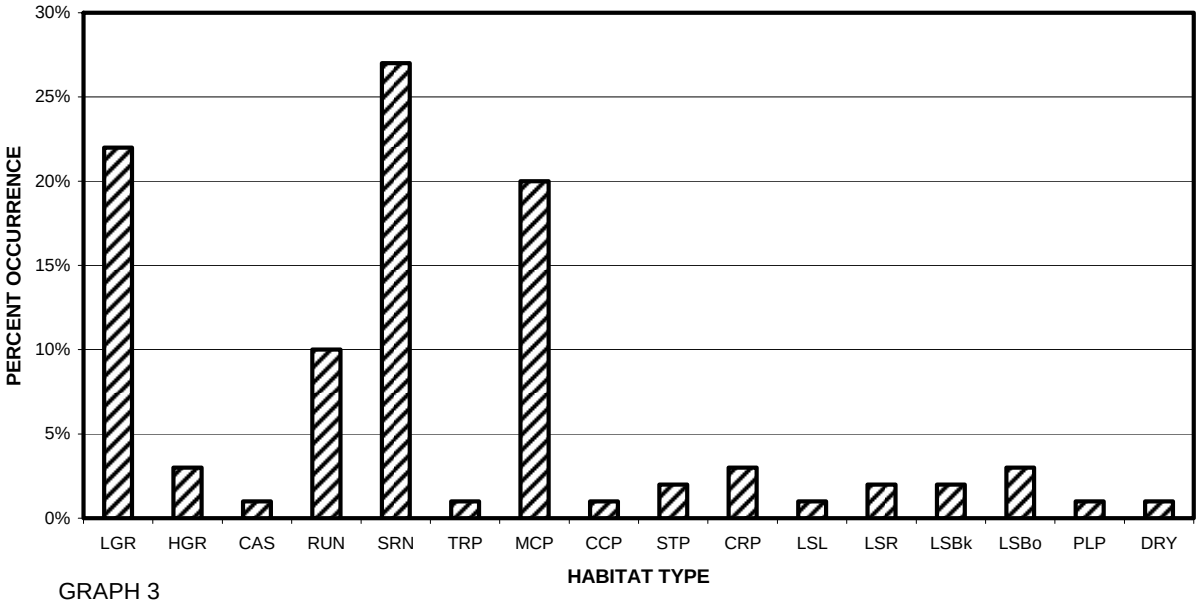
GRAPH 1

INMAN CREEK 2004
HABITAT TYPES BY PERCENT TOTAL LENGTH



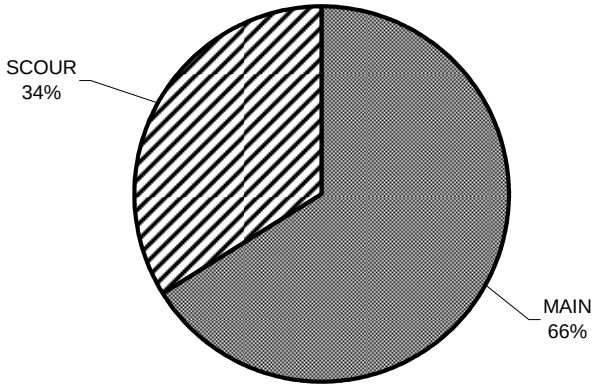
GRAPH 2

INMAN CREEK 2004
HABITAT TYPES BY PERCENT OCCURRENCE



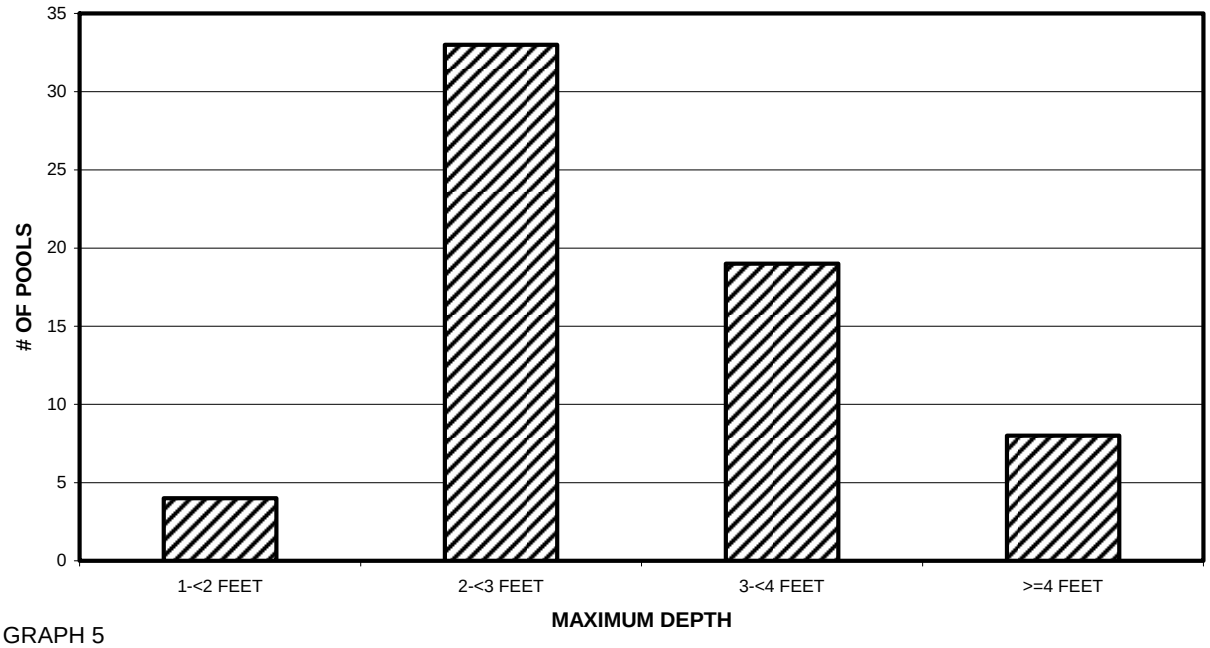
GRAPH 3

INMAN CREEK 2004
POOL TYPES BY PERCENT OCCURRENCE



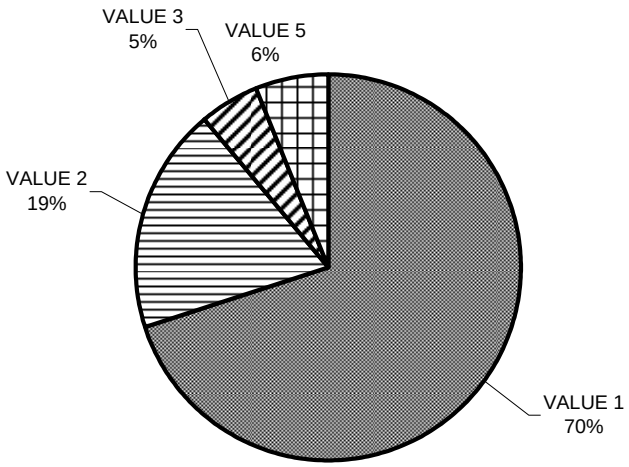
GRAPH 4

INMAN CREEK 2004
MAXIMUM DEPTH IN POOLS



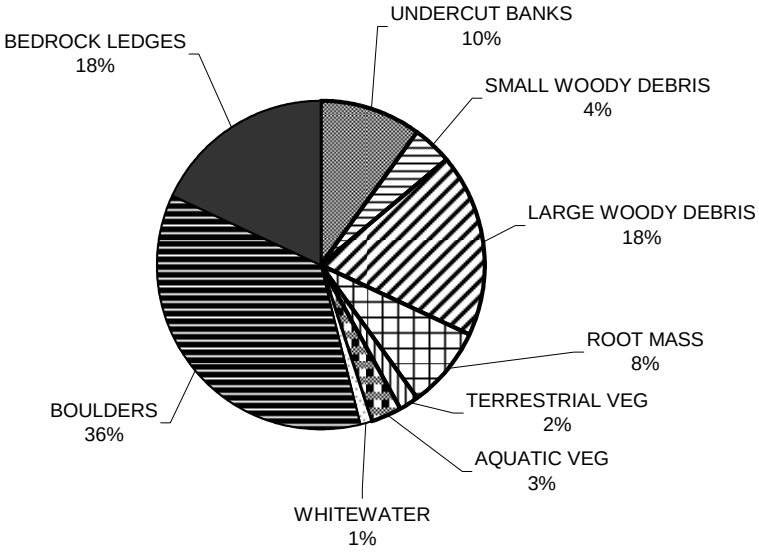
GRAPH 5

INMAN CREEK 2004
PERCENT EMBEDDEDNESS



GRAPH 6

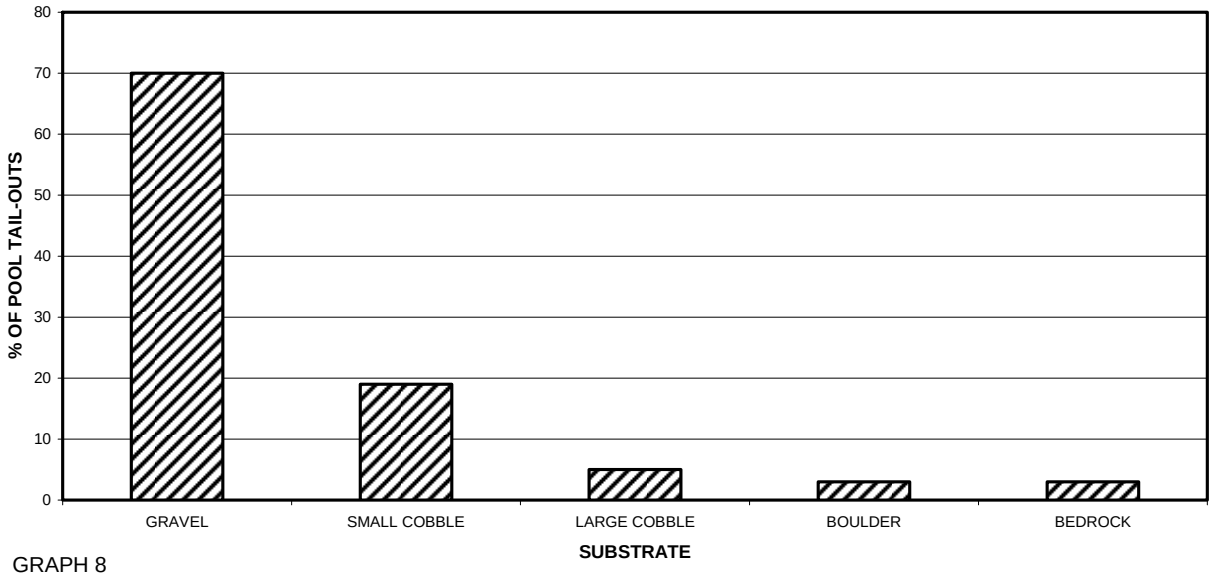
INMAN CREEK 2004
MEAN PERCENT COVER TYPES IN POOLS



GRAPH 7

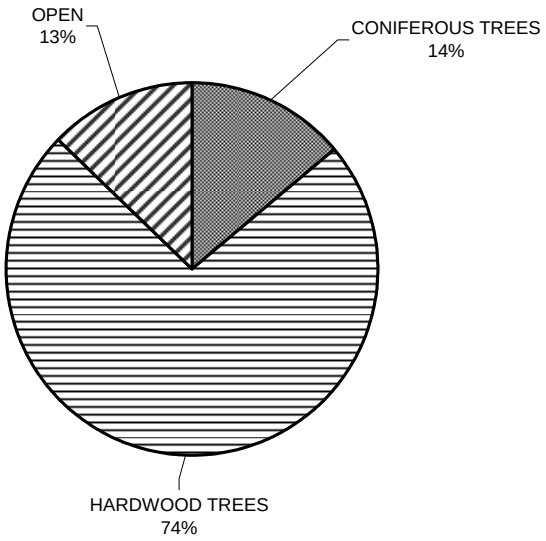
Inman Creek

INMAN CREEK 2004
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



GRAPH 8

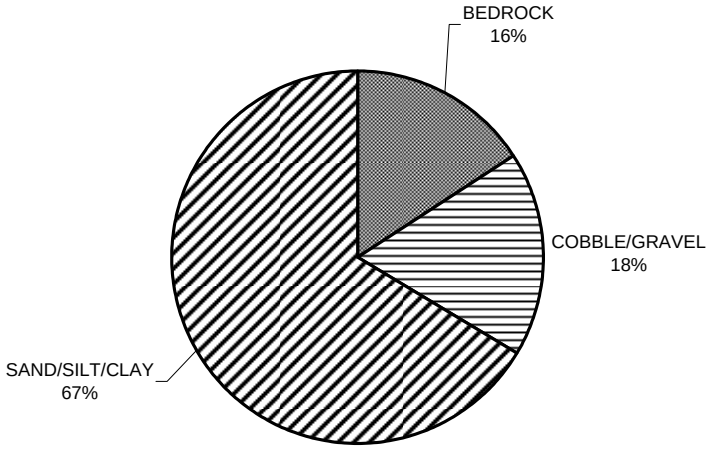
INMAN CREEK 2004
MEAN PERCENT CANOPY



GRAPH 9

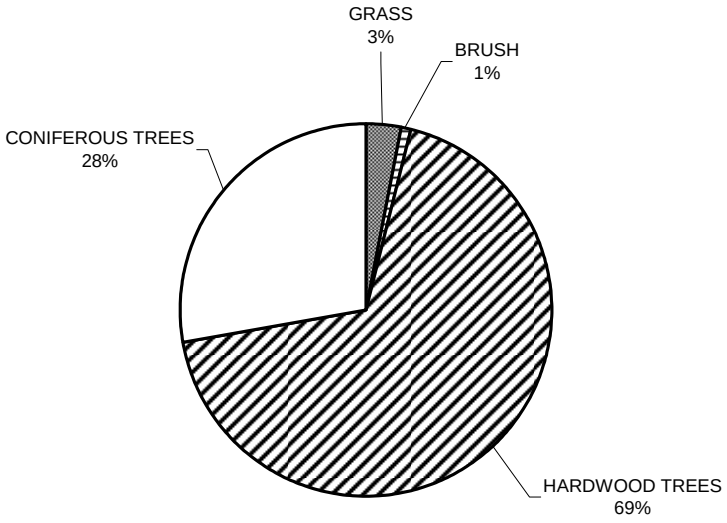
Inman Creek

INMAN CREEK 2004
DOMINANT BANK COMPOSITION IN SURVEY REACH



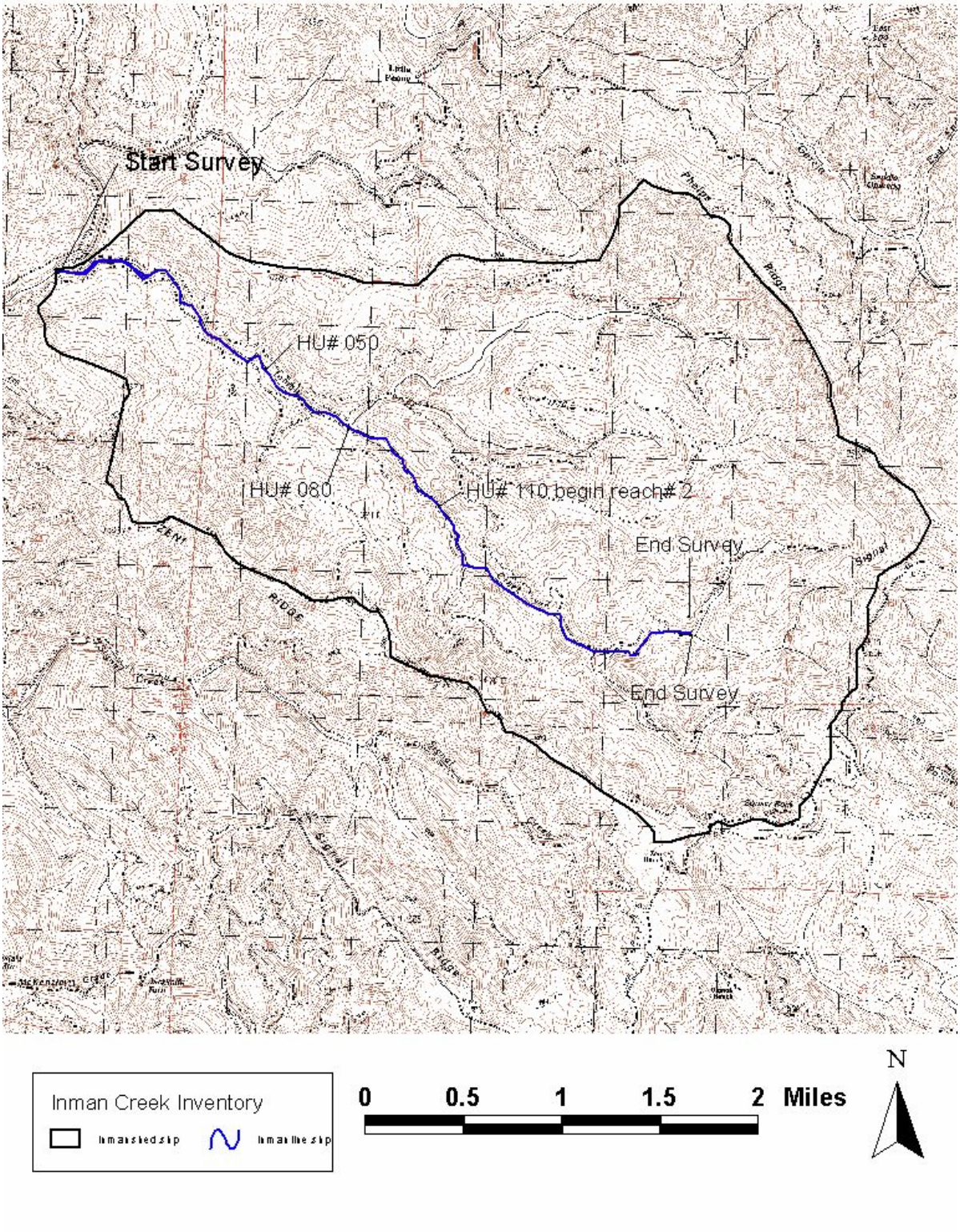
GRAPH 10

INMAN CREEK 2004
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

Inman Creek



Map 1. Map of Inman Creek showing the stream habitat inventory reach and watershed boundary.

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