

# STREAM INVENTORY REPORT

## “West Fork Abalobadiah Creek”

### INTRODUCTION

A stream inventory was conducted July 22, 2008 on an unnamed tributary to Abalobadiah Creek commonly known as and hereinafter referred to as West Fork Abalobadiah Creek. The survey began at the confluence with Abalobadiah Creek and extended upstream 0.8 miles.

The objective of the habitat inventory was to document the habitat available to anadromous salmonids in West Fork Abalobadiah Creek.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for 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

West Fork Abalobadiah Creek is a tributary to Abalobadiah Creek which drains to the Pacific Ocean, located in Mendocino County, California (Map 1). West Fork Abalobadiah Creek's legal description at the confluence with Abalobadiah Creek is T20N R17W S21. Its location is 39.5854 north latitude and 123.7610 west longitude, LLID number 1237600395837. West Fork Abalobadiah Creek is a first order stream and has approximately 1.3 miles of blue line stream according to the USGS Inglenook 7.5 minute quadrangle. West Fork Abalobadiah Creek drains a watershed of approximately 0.53 square miles. Elevations range from about 100 feet at the mouth of the creek to 400 feet in the headwater areas. Mixed hardwood and conifer forest dominates the watershed. The watershed is privately owned and is managed for timber production and rangeland. Vehicle access exists via a private gated road off Highway 1.

### METHODS

The habitat inventory conducted in West Fork Abalobadiah Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The Pacific States Marine Fisheries Commission (PSMFC) Fisheries Technicians 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 habitat type and their lengths are 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

## West Fork Abalobadiah Creek

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.

### 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 West Fork Abalobadiah 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". West Fork Abalobadiah 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.

## West Fork Abalobadiah Creek

### 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 West Fork Abalobadiah 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 West Fork Abalobadiah 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 densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In West Fork Abalobadiah 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 West Fork Abalobadiah 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.

## West Fork Abalobadiah Creek

### 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.

## DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.19, 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 West Fork Abalobadiah 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

## West Fork Abalobadiah Creek

- 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 22, 2008 was conducted by W. Holloway and D. Wright (PSMFC). The total length of the stream surveyed was 4,028 feet.

Stream flow was estimated to be less than 0.11 cfs during the survey period.

West Fork Abalobadiah Creek is a B4 channel type for 4,028 feet of the stream surveyed. B4 channels are moderately entrenched, moderate gradient, riffle dominated channel with infrequently spaced pools, very stable plan and profile, stable banks and gravel-dominant substrates.

Water temperatures taken during the survey period ranged from 53 to 57 degrees Fahrenheit. Air temperatures ranged from 60 to 70 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 40% pool units, 32% flatwater units, and 14% riffle units (Graph 1). Based on total length of Level II habitat types there were 64% flatwater units, 19% pool units, and 11% riffle units (Graph 2).

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were lateral scour pool - log enhanced units, 28%; run units, 21%; and low gradient riffle units, 14% (Graph 3). Based on percent total length, run units made up 39%, step run units 25%, and lateral scour pool - log enhanced units 14%.

A total of 36 pools were identified (Table 3). Scour pools were the most frequently encountered at 83% (Graph 4), and comprised 84% of the total length of all pools (Table 3).

Table 4 is a summary of maximum residual pool depths by pool habitat types. Pool quality for salmonids increases with depth. Seven of the 36 pools (19%) measured had a residual depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 36 pool tail-outs measured, 3 had a value of 2 (8.3%); 17 had a value of 3 (47.2%); 14 had a value of 4 (38.9%); 2 had a value of 5 (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

## **West Fork Abalobadiah Creek**

deemed unsuited for spawning due to inappropriate substrate such as bedrock, log sills, boulders, or other considerations.

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 8, flatwater habitat types had a mean shelter rating of 75, and pool habitats had a mean shelter rating of 98 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 101. Main channel pools had a mean shelter rating of 80 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Terrestrial vegetation is the dominant cover type in West Fork Abalobadiah Creek. Graph 7 describes the pool cover in West Fork Abalobadiah Creek. Terrestrial vegetation is 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 89% of the pool tail-outs. Small cobble was the next most frequently observed dominant substrate type and occurred in 6% of the pool tail-outs.

The mean percent canopy density for the surveyed length of West Fork Abalobadiah Creek was 96%. Four percent of the canopy was open. Of the canopy present, the mean percentages of hardwood and coniferous trees were 86% and 14%, respectively. Graph 9 describes the mean percent canopy in West Fork Abalobadiah Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 87%. The mean percent left bank vegetated was 83%. The dominant elements composing the structure of the stream banks consisted of 100% sand/silt/clay (Graph 10). Brush was the dominant vegetation type observed in 88% of the units surveyed. Additionally, 12% of the units surveyed had grass as the dominant vegetation type (Graph 11).

## **DISCUSSION**

West Fork Abalobadiah Creek is a B4 channel type for 4,028 feet of the stream surveyed. The suitability of B4 channel types for fish habitat improvement structures is as follows: B4 channel types are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors, and log cover.

The water temperatures recorded on the survey day of July 22, 2008 ranged from 53 to 57 degrees Fahrenheit. Air temperatures ranged from 60 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 64% of the total length of this survey, riffles 11%, and pools 19%. Seven of the 36 (19%) pools had a maximum residual depth greater than 2 feet. In general, pool enhancement projects are considered when primary pools comprise less than 40%

## **West Fork Abalobadiah Creek**

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 channel width. Installing structures that will increase or deepen pool habitat is recommended.

Three of the 36 pool tail-outs measured had embeddedness ratings of 1 or 2. Thirty-one of the pool tail-outs had embeddedness ratings of 3 or 4. Two 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. Sediment sources in West Fork Abalobadiah Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.

Thirty-four of the 36 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 98. The shelter rating in the flatwater habitats was 75. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by terrestrial vegetation in West Fork Abalobadiah Creek. Terrestrial vegetation is 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 96%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was 87% and 83%, 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) West Fork Abalobadiah 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) 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.

## West Fork Abalobadiah Creek

- 4) 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.
- 5) There are sections where the stream is being impacted from cattle trampling the riparian zone. Alternatives should be explored with the grazier and developed if possible.

### 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 Abalobadiah Creek.
19	0002.00	A pool is formed below the culvert.
31	0003.00	The culvert appears to be clean, clear of debris and in good condition.
56	0004.00	The channel is intermittent in this unit.
259	0008.00	There are right bank and left bank failures throughout. There is sediment accumulation throughout.
486	0010.00	There are right bank and left bank failures throughout.
610	0013.00	The banks are eroding and contributing fine sediment.
632	0014.00	The banks are eroding and contributing fine sediment.
670	0015.00	Cattle in riparian area at the top of the unit.
774	0018.00	The streambanks are failing.
795	0019.00	The streambanks are failing.
938	0022.00	The left bank is failing and contributing fine sediment to stream.
970	0023.00	There are bank failures throughout.
1051	0024.00	A large amount of woody debris and sediment is accumulated in the unit.



## West Fork Abalobadiah Creek

1114	0025.00	There is dense brush and large woody debris possibly creating difficult fish passage.
1393	0028.00	There are cattle crossing in the stream.
1492	0030.00	The right bank is eroding.
1514	0031.00	There are bank failures and sediment deposits throughout unit.
1668	0032.00	The banks are eroding. Salmonid Y+ observed.
1685	0033.00	Cattle begin to access creek here.
1776	0036.00	End of cattle access.
1924	0039.00	Channel is shallow and narrow. There is dense brush and eroding banks throughout.
2190	0044.00	There is a sediment accumulation.
2219	0045.00	There is a sediment accumulation and very little water present.
2545	0052.00	There is a large log debris accumulation. The streambanks are eroding.
2669	0053.00	The streambanks are eroding.
2793	0057.00	Streambank failures throughout.
2847	0058.00	The right streambank is eroding.
2898	0060.00	There is a sediment retention at top of unit.
2969	0063.00	There are streambank failures throughout.
3084	0067.00	There are right bank and left bank failures. Sediment accumulation area.
3247	0069.00	The left bank is eroding.
3256	0070.00	Left bank failure causing sediment accumulation and may be resulting in dry stream.
3313	0074.00	The left bank is eroding.
3327	0076.00	The left bank is eroding. There is sediment accumulation.
3343	0077.00	There is a 4' foot jump to next unit.

## West Fork Abalobadiah Creek

3365	0078.00	Cattle access begins here.
3487	0079.00	Abundant salmonid Y+ observed.
3507	0080.00	Class I/II transition flagging.
3604	0082.00	Channel is intermittent.
3708	0084.00	This is the end point of livestock access.
3778	0085.00	There is a left bank failure.
3800	0086.00	Begin cattle access.
3897	0088.00	End of cattle access.
4028	0090.00	End of survey. The channel has become very narrow and shallow with little flow, infrequent pools, and more frequent dry units. The next unit is a very long dry unit. No fish observed above class I/II transition flagging.

## REFERENCES

Flosi, G., Downie, S., Hopelain, J., Bird, M., Coey, R., and Collins, B. 1998. *California Salmonid Stream Habitat Restoration Manual*, 3rd edition. California Department of Fish and Game, Sacramento, California.

## West Fork Abalobadiah Creek

### 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]	

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

Stream Name: West Fork Abalobadiah Creek

LLID: 1237600395837 Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Confluence Location: Quad: INGLENOOK Legal Description: T20NR17WS21 Latitude: 39:35:01.0N Longitude: 123:45:36.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	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	CULVERT	1.1	25	25	0.6									
11	0	DRY	12.2	20	222	5.5									
29	9	FLATWATER	32.2	89	2582	64.1	3.7	0.4	0.8	225	6530	100	2895		75
36	36	POOL	40.0	21	762	18.9	4.7	0.8	1.4	98	3528	97	3488	81	98
13	3	RIFFLE	14.4	34	437	10.8	2.7	0.2	0.3	14	186	2	30		8
<b>Total Units</b>	<b>Total Units Fully Measured</b>				<b>Total Length (ft.)</b>					<b>Total Area (sq.ft.)</b>			<b>Total Volume (cu.ft.)</b>		
90	48				4028					10245			6413		

**Table 2 - Summary of Habitat Types and Measured Parameters**

Stream Name: West Fork Abalobadiah Creek

LLID: 1237600395837

Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:01.0N

Longitude: 123:45:36.0W

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 (%)
13	3	LGR	14.4	34	437	10.8	3	0.2	0.6	14	186	2	30		8	96
19	6	RUN	21.1	82	1564	38.8	4	0.3	1.8	256	4862	112	2122		74	95
10	3	SRN	11.1	102	1018	25.3	3	0.5	1.1	164	1638	76	761		77	95
6	6	MCP	6.7	20	120	3.0	4	0.9	2.2	89	531	96	573	78	80	94
2	2	CRP	2.2	16	32	0.8	6	0.6	1.9	84	168	62	125	49	48	100
25	25	LSL	27.8	23	565	14.0	5	0.8	2	104	2598	98	2439	81	105	97
1	1	LSBo	1.1	16	16	0.4	4	0.6	1.1	45	45	31	31	27	240	100
2	2	PLP	2.2	14	29	0.7	6	1.6	2.5	93	186	160	320	151	38	92
11	0	DRY	12.2	20	222	5.5										93
1	0	CUL	1.1	25	25	0.6										

Total Units  
90

Total Units Fully Measured  
48

Total Length (ft.)  
4028

Total Area (sq.ft.)  
10214

Total Volume (cu.ft.)  
6402

**Table 3 - Summary of Pool Types**

Stream Name: West Fork Abalobadiah Creek

LLID: 1237600395837

Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:01.0N

Longitude: 123:45:36.0W

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
6	6	MAIN	17	20	120	16	4.5	0.9	89	531	78	466	80
30	30	SCOUR	83	21	642	84	4.8	0.8	100	2997	82	2448	101

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
36	36	762	3528	2914

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

Stream Name: West Fork Abalobadiah Creek

LLID: 1237600395837

Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:01.0N

Longitude: 123:45:36.0W

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
6	MCP	17	0	0	3	50	3	50	0	0	0	0
2	CRP	6	0	0	2	100	0	0	0	0	0	0
25	LSL	69	5	20	18	72	2	8	0	0	0	0
1	LSBo	3	0	0	1	100	0	0	0	0	0	0
2	PLP	6	0	0	0	0	2	100	0	0	0	0

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
36	5	14	24	67	7	19	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1.4

**Table 5 - Summary of Mean Percent Cover By Habitat Type**

Stream Name: West Fork Abalobadiah Creek

LLID: 1237600395837

Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Dry Units: 11

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21 Latitude: 39:35:01.0N

Longitude: 123:45:36.0W

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
13	4	LGR	0	25	0	0	68	0	0	8	0
13	4	TOTAL RIFFLE	0	25	0	0	68	0	0	8	0
19	6	RUN	0	28	15	0	57	0	0	0	0
10	3	SRN	0	30	17	0	53	0	0	0	0
29	9	TOTAL FLAT	0	29	16	0	56	0	0	0	0
6	6	MCP	3	23	18	3	45	0	0	7	0
2	2	CRP	0	10	15	0	75	0	0	0	0
25	25	LSL	0	31	38	0	30	0	0	1	0
1	1	LSBo	0	20	20	0	20	0	0	40	0
2	2	PLP	0	0	0	0	73	0	15	13	0
36	36	TOTAL POOL	1	26	31	1	37	0	1	4	0
1	0	CUL									
90	49	TOTAL	0	27	26	0	43	0	1	3	0



**Table 6 - Summary of Dominant Substrates By Habitat Type**

Stream Name: West Fork Abalobadiah Creek

LLID: 1237600395837

Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Dry Units: 11

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:01.0N

Longitude: 123:45:36.0W

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
13	4	LGR	0	0	50	50	0	0	0
19	6	RUN	0	0	83	17	0	0	0
10	3	SRN	0	0	100	0	0	0	0
6	6	MCP	67	17	17	0	0	0	0
2	2	CRP	50	0	50	0	0	0	0
25	25	LSL	40	20	40	0	0	0	0
1	1	LSBo	100	0	0	0	0	0	0
2	2	PLP	50	0	50	0	0	0	0

**Table 7 - Summary of Mean Percent Canopy for Entire Stream**

Stream Name: West Fork Abalobadiah Creek

LLID: 1237600395837

Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:01.0N

Longitude: 123:45:36.0W

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
96	14	86	0	87	83

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

**Table 8 - Fish Habitat Inventory Data Summary**

Stream Name: West Fork Abalobadiah Creek      LLID: 1237600395837      Drainage: Rockport  
 Survey Dates: 7/22/2008 to 7/22/2008      Survey Length (ft.): 4028      Main Channel (ft.): 4028      Side Channel (ft.): 0  
 Confluence Location: Quad: INGLENOOK      Legal Description: T20NR17WS21      Latitude: 39:35:01.0N      Longitude: 123:45:36.0W

**Summary of Fish Habitat Elements By Stream Reach**

**STREAM REACH: 1**

Channel Type: B4	Canopy Density (%): 95.8	Pools by Stream Length (%): 18.9
Reach Length (ft.): 4028	Coniferous Component (%): 13.9	Pool Frequency (%): 40.0
Riffle/Flatwater Mean Width (ft.): 3.4	Hardwood Component (%): 86.1	Residual Pool Depth (%):
BFW:	Dominant Bank Vegetation: Brush	< 2 Feet Deep: 81
Range (ft.): 2 to 8	Vegetative Cover (%): 84.9	2 to 2.9 Feet Deep: 19
Mean (ft.): 6	Dominant Shelter: Terrestrial Veg.	3 to 3.9 Feet Deep: 0
Std. Dev.: 2	Dominant Bank Substrate Type: Sand/Silt/Clay	>= 4 Feet Deep: 0
Base Flow (cfs.): 0.1	Occurrence of LWD (%): 26	Mean Max Residual Pool Depth (ft.): 1.4
Water (F): 53 - 57    Air (F): 60 - 70	LWD per 100 ft.:	Mean Pool Shelter Rating: 98
Dry Channel (ft): 222	Riffles: 1	
	Pools: 11	
	Flat: 4	
Pool Tail Substrate (%): Silt/Clay: 3    Sand: 3    Gravel: 89    Sm Cobble: 6    Lg Cobble: 0    Boulder: 0    Bedrock: 0		
Embeddedness Values (%): 1. 0.0    2. 8.3    3. 47.2    4. 38.9    5. 5.6		

**Table 9 - Mean Percentage of Dominant Substrate and Vegetation**

Stream Name: West Fork Abalobadiah Creek

LLID: 1237600395837

Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

Latitude: 39:35:01.0N

Longitude: 123:45:36.0W

**Mean Percentage of Dominant Stream Bank Substrate**

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Bedrock	0	0	0.0
Boulder	0	0	0.0
Cobble / Gravel	0	0	0.0
Sand / Silt / Clay	49	49	100.0

**Mean Percentage of Dominant Stream Bank Vegetation**

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percent (%)
Grass	5	7	12.2
Brush	44	42	87.8
Hardwood Trees	0	0	0.0
Coniferous Trees	0	0	0.0
No Vegetation	0	0	0.0

**Total Stream Cobble Embeddedness Values:** 3

**Table 10 - Mean Percent of Shelter Cover Types For Entire Stream**

StreamName: West Fork Abalobadiah Creek

LLID: 1237600395837

Drainage: Rockport

Survey Dates: 7/22/2008 to 7/22/2008

Confluence Location: Quad: INGLENOOK

Legal Description: T20NR17WS21

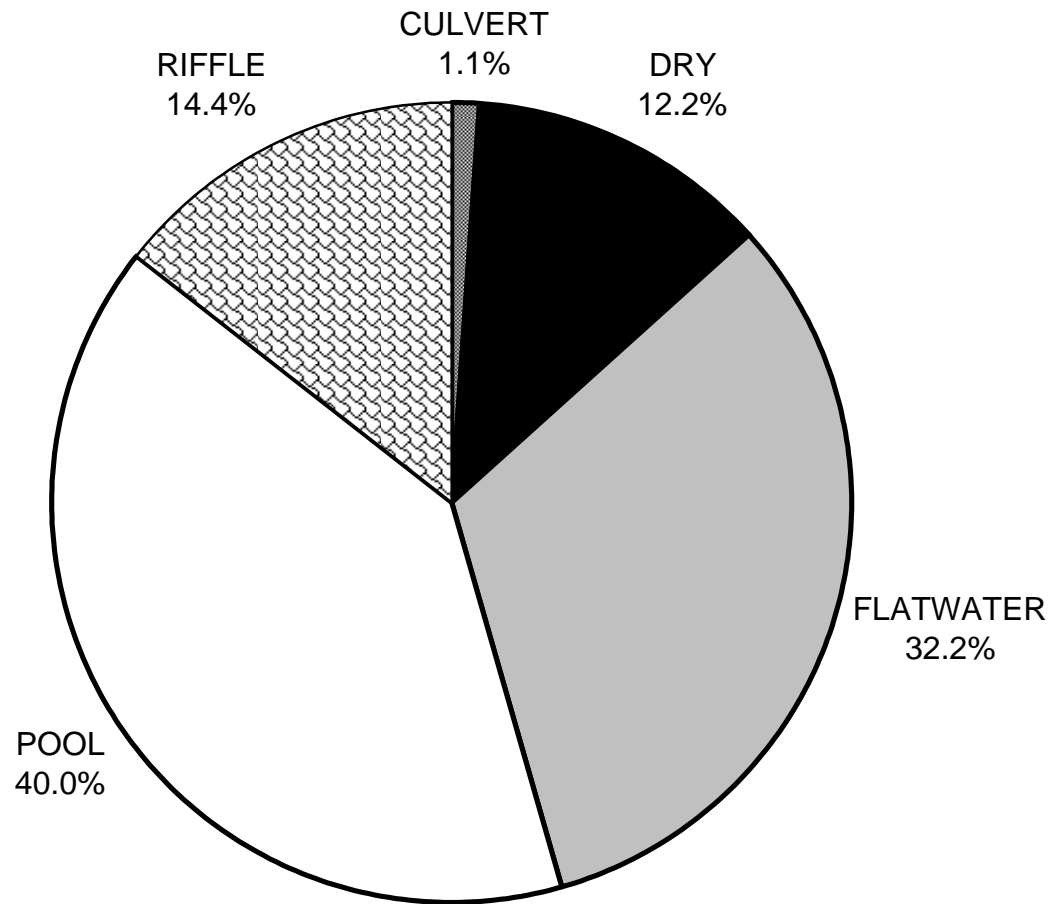
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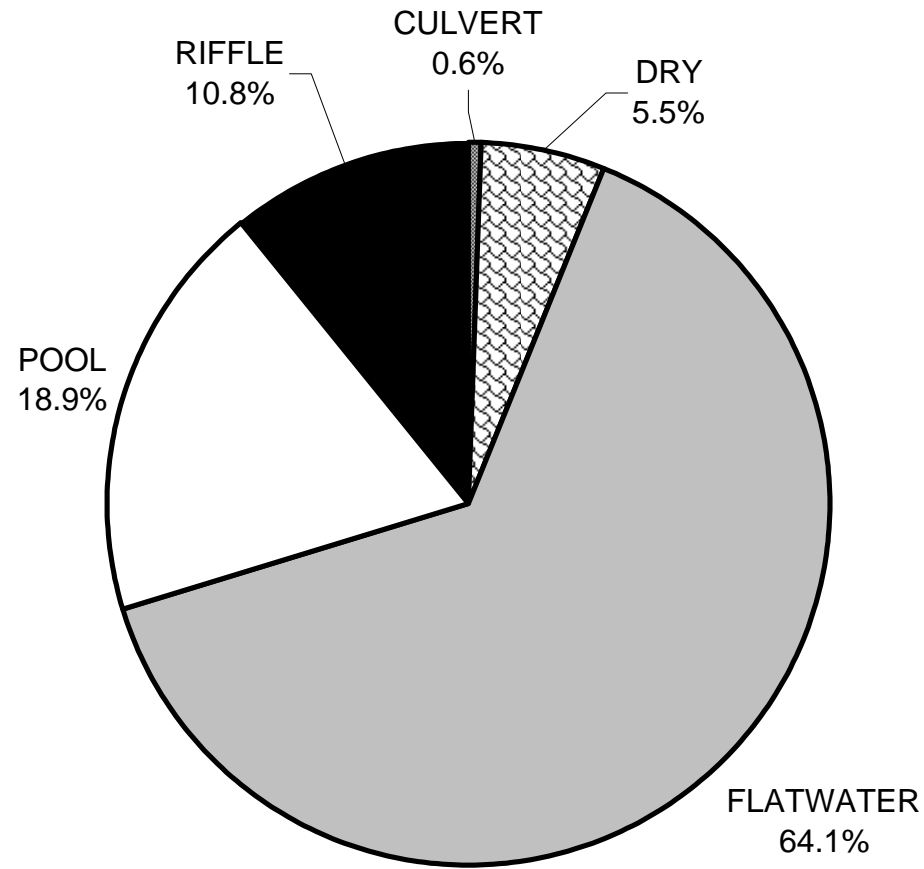
	<b>Riffles</b>	<b>Flatwater</b>	<b>Pools</b>
UNDERCUT BANKS (%)	0	0	1
SMALL WOODY DEBRIS (%)	25	29	26
LARGE WOODY DEBRIS (%)	0	16	31
ROOT MASS (%)	0	0	1
TERRESTRIAL VEGETATION (%)	68	56	37
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	0	0	1
BOULDERS (%)	8	0	4
BEDROCK LEDGES (%)	0	0	0

# WEST FORK ABALOBADIAH CREEK 2008 HABITAT TYPES BY PERCENT OCCURRENCE



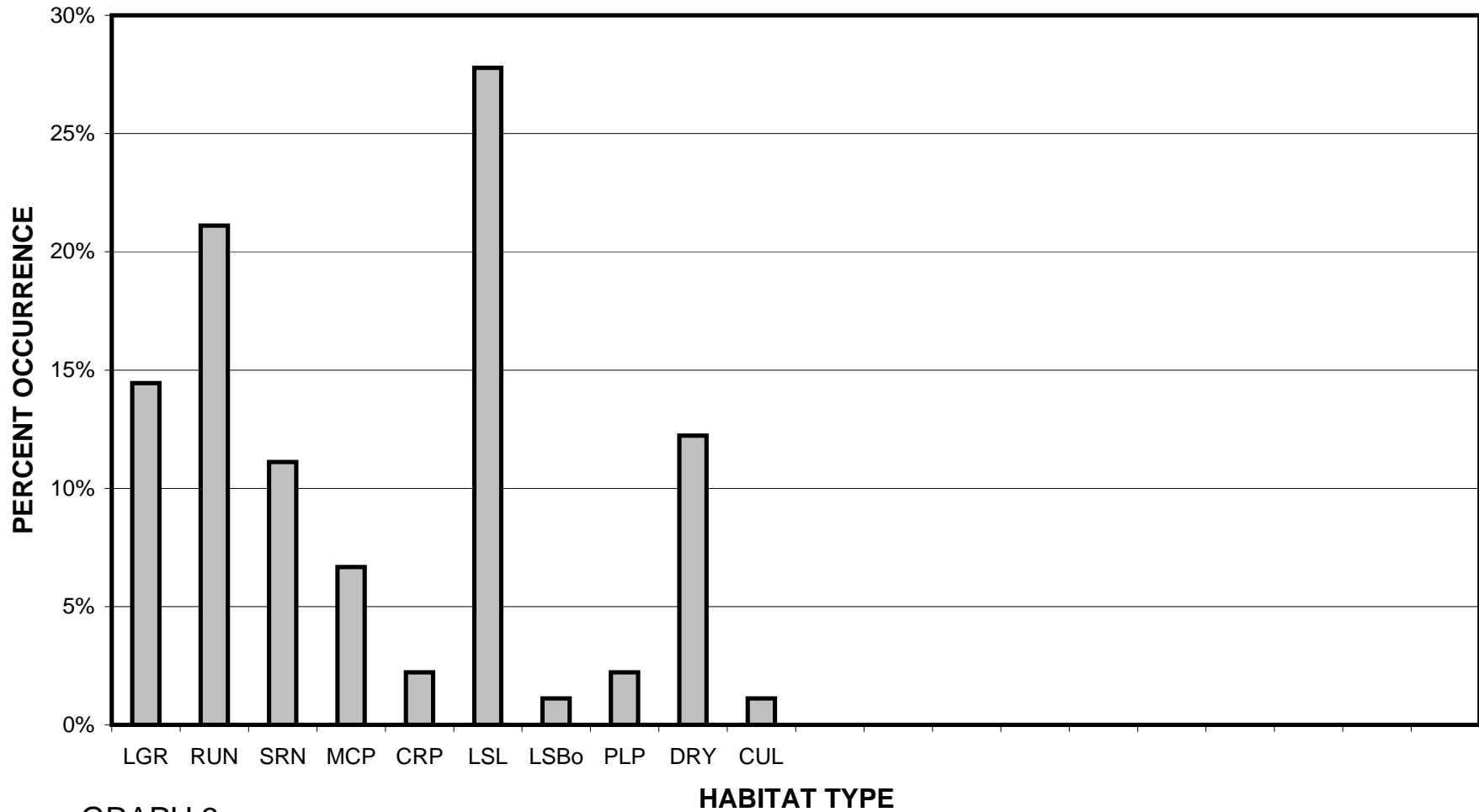
GRAPH 1

# WEST FORK ABALOBADIAH CREEK 2008 HABITAT TYPES BY PERCENT TOTAL LENGTH



GRAPH 2

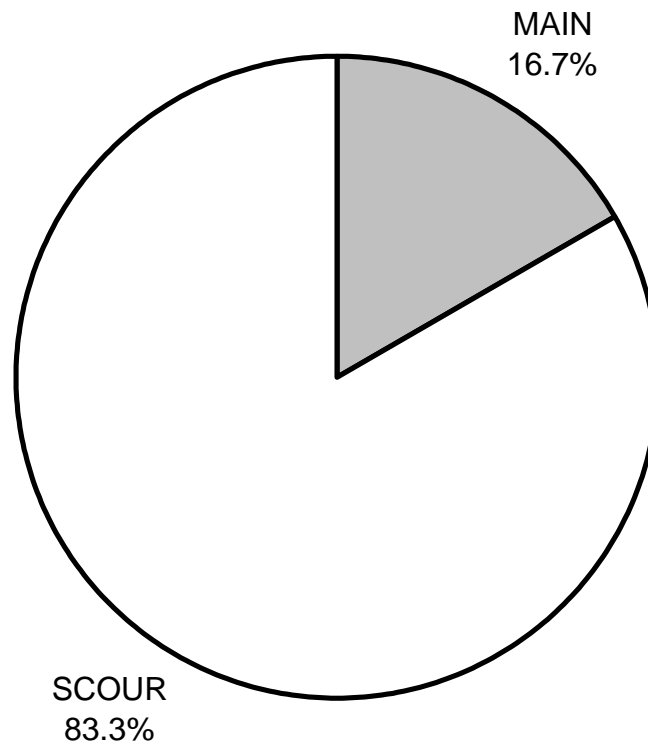
# WEST FORK ABALOBADIAH CREEK 2008 HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 3

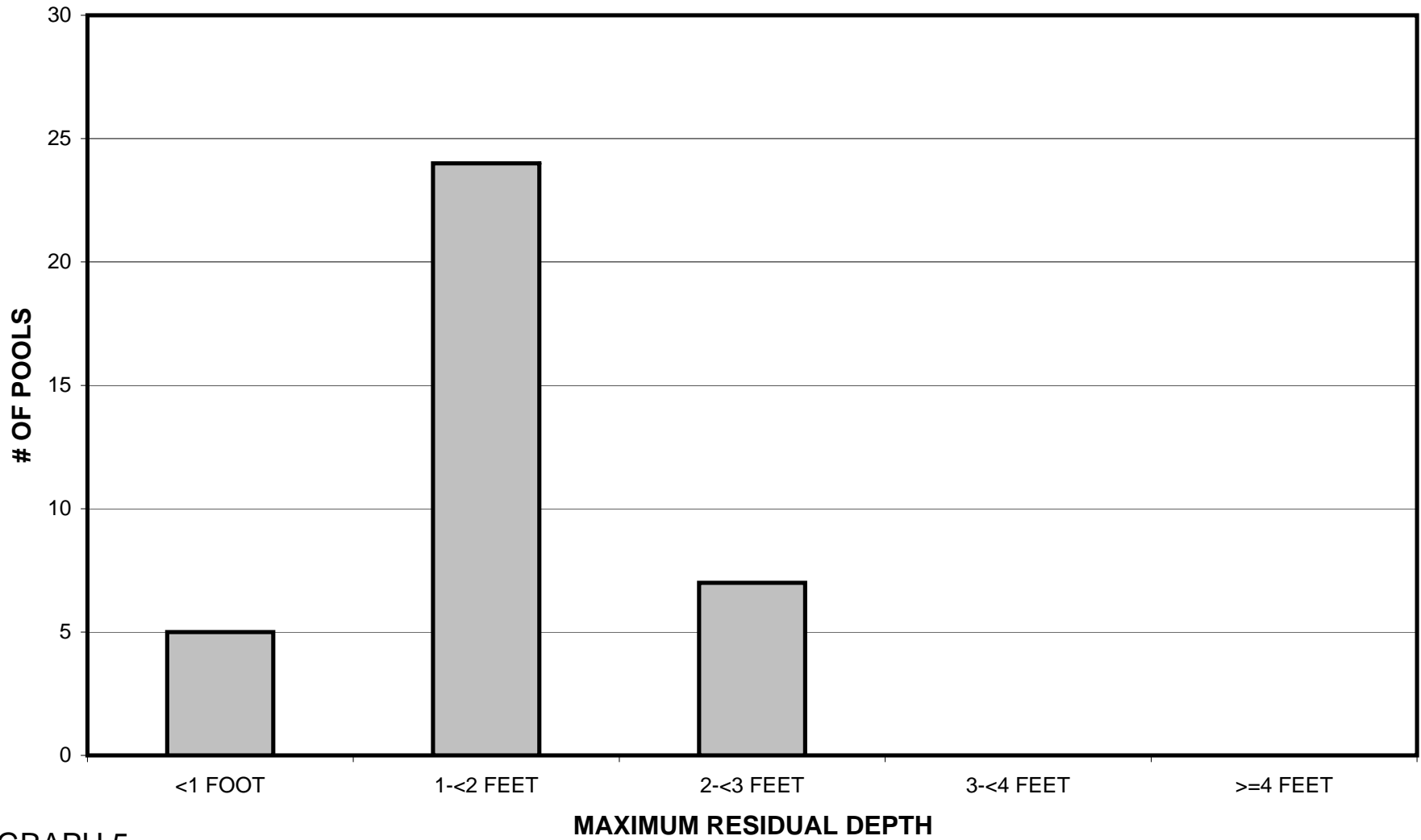


**WEST FORK ABALOBADIAH CREEK 2008  
POOL TYPES BY PERCENT OCCURRENCE**



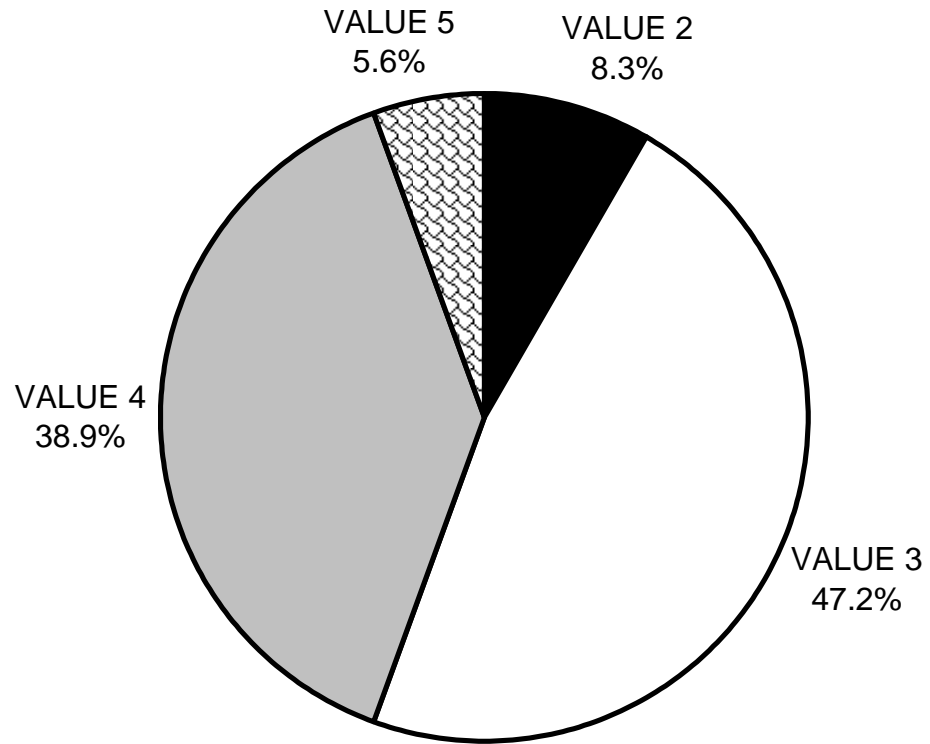
GRAPH 4

# WEST FORK ABALOBADIAH CREEK 2008 MAXIMUM DEPTH IN POOLS



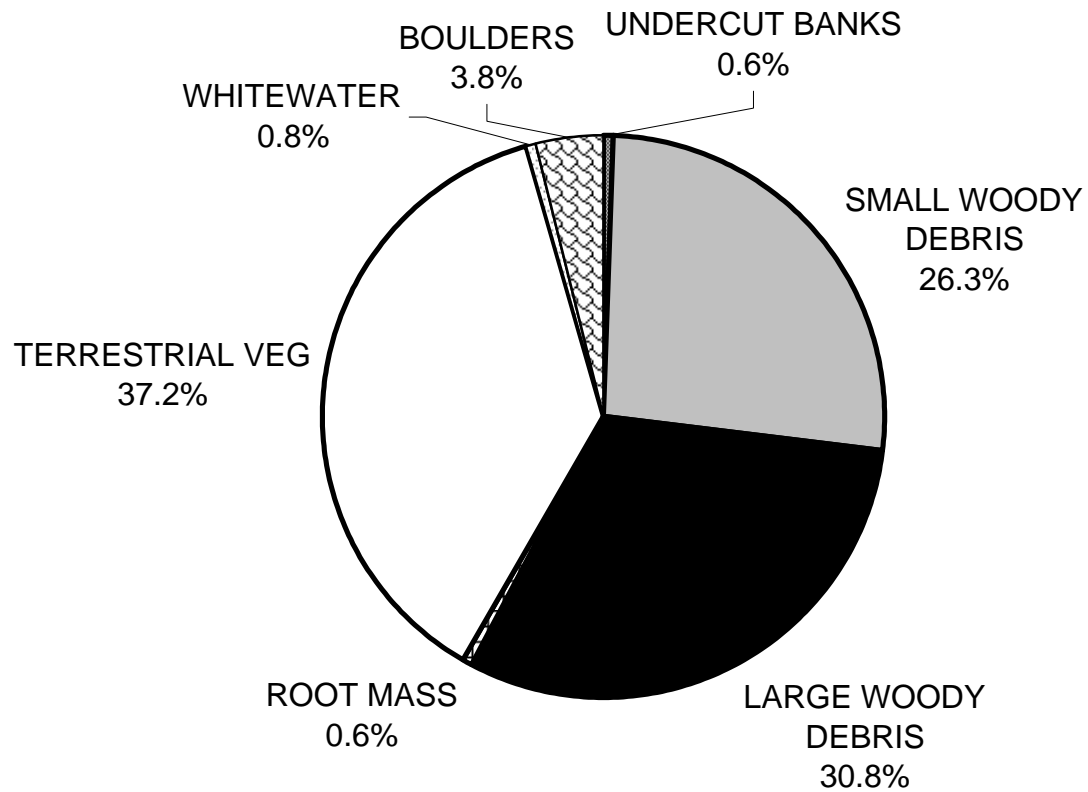
GRAPH 5

# WEST FORK ABALOBADIAH CREEK 2008 PERCENT EMBEDDEDNESS



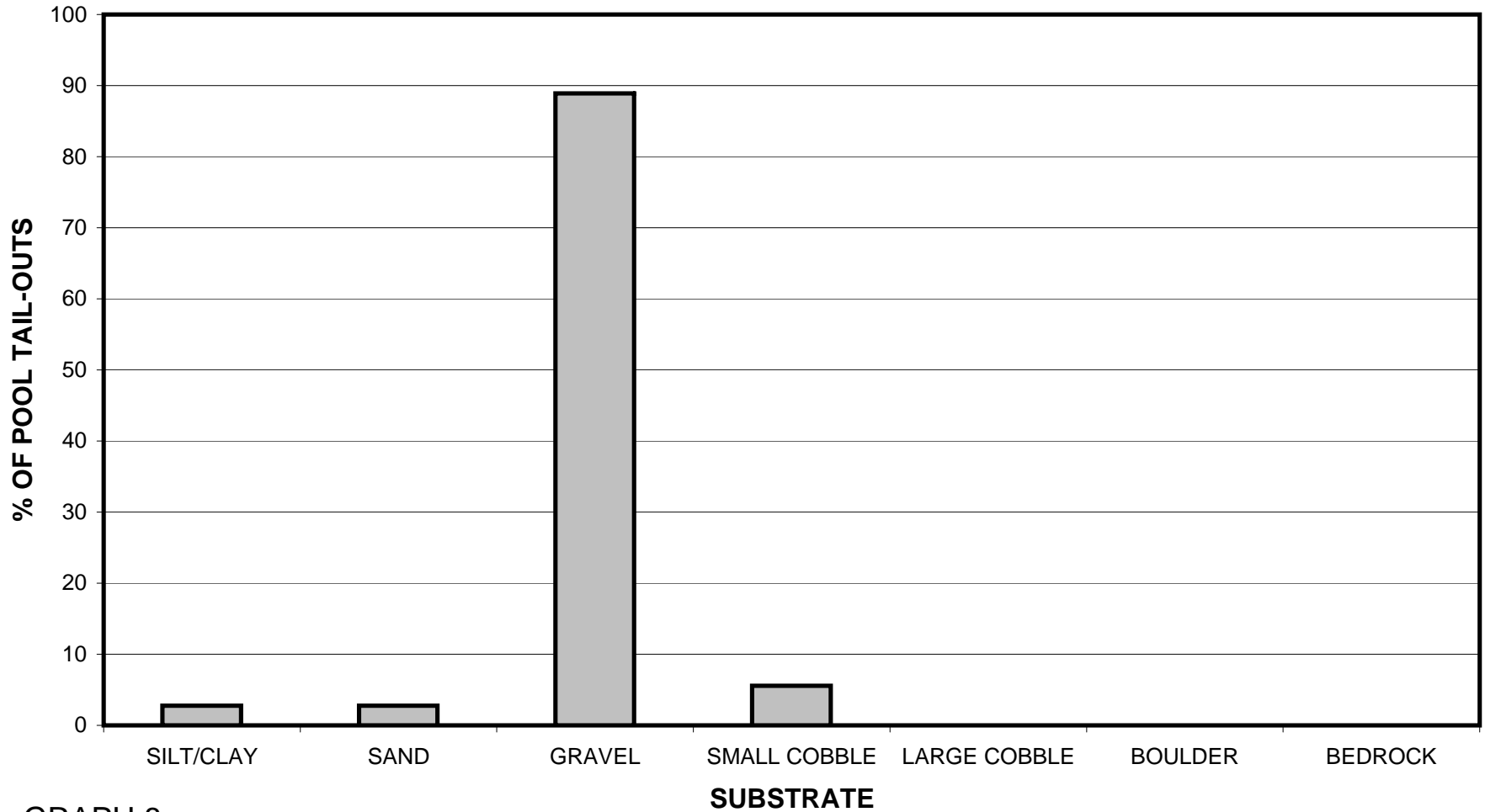
GRAPH 6

# WEST FORK ABALOBADIAH CREEK 2008 MEAN PERCENT COVER TYPES IN POOLS



GRAPH 7

# WEST FORK ABALOBADIAH CREEK 2008 SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



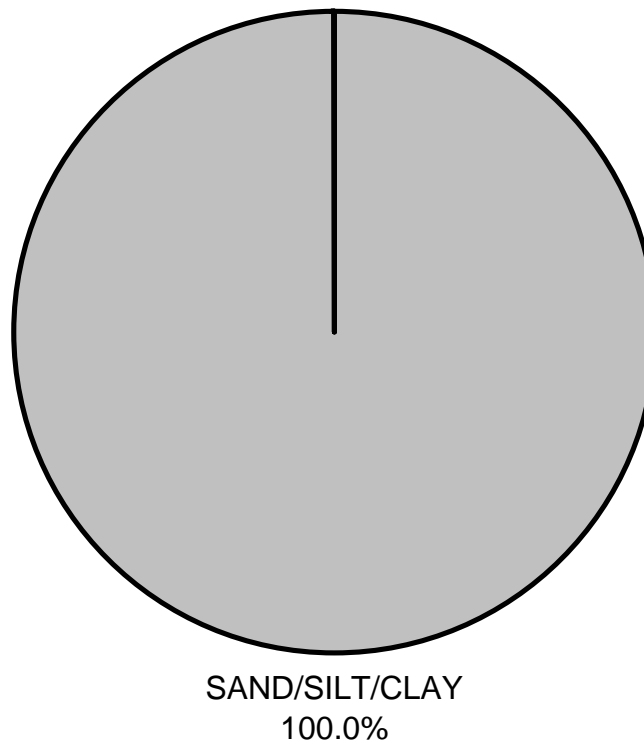
GRAPH 8

# WEST FORK ABALOBADIAH CREEK 2008 MEAN PERCENT CANOPY



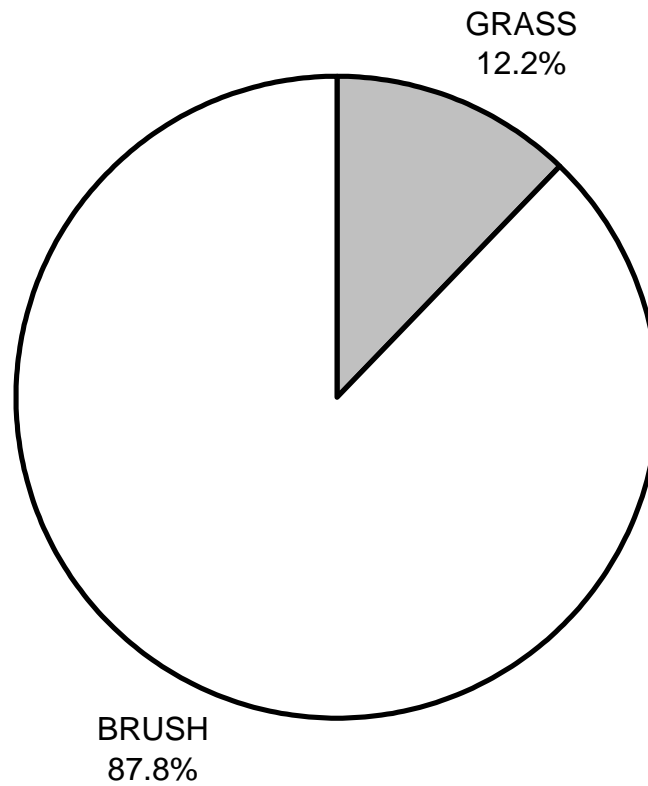
GRAPH 9

**WEST FORK ABALOBADIAH CREEK 2008  
DOMINANT BANK COMPOSITION IN SURVEY REACH**



GRAPH 10

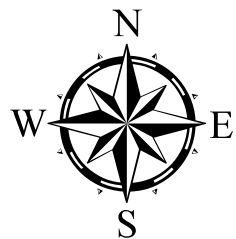
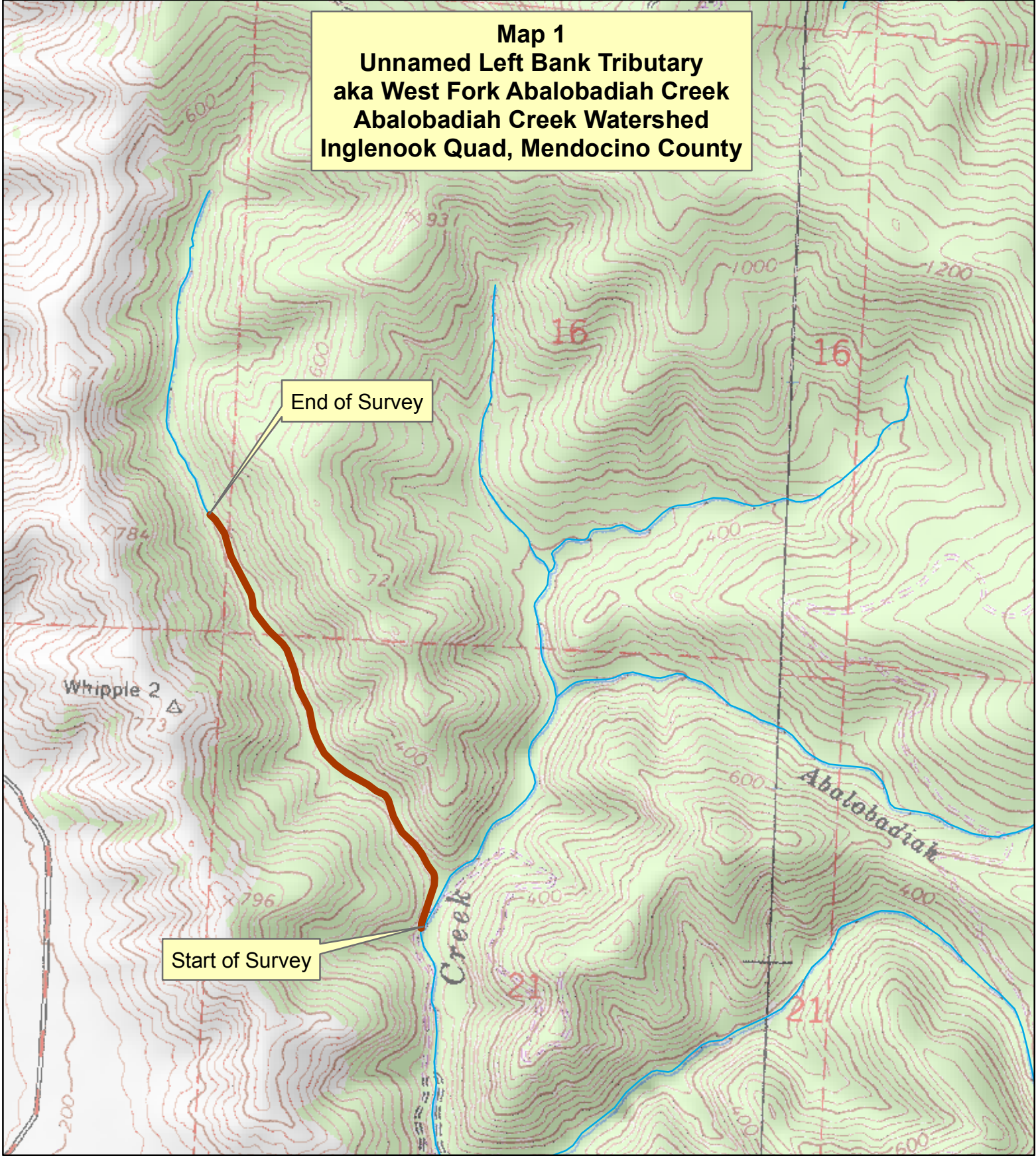
**WEST FORK ABALOBADIAH CREEK 2008  
DOMINANT BANK VEGETATION IN SURVEY REACH**



GRAPH 11



**Map 1**  
**Unnamed Left Bank Tributary**  
**aka West Fork Abalobadiah Creek**  
**Abalobadiah Creek Watershed**  
**Inglenook Quad, Mendocino County**



**Legend**

 2008 Surveyed Length

0 800 1,600 Feet



End survey point is approximate.

