

# **STREAM INVENTORY REPORT**

## **Jackass Creek aka Wolf Creek**

### INTRODUCTION

A California Department of Fish and Game (DFG) fisheries inventory was conducted in summer 1999 on the mainstem of Jackass Creek and North Fork Jackass Creek. The creek is named Jackass Creek on US Geological Survey maps, however it is also known as Wolf Creek. The 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; the objective of the biological inventory was to document the presence and distribution of juvenile salmonid species. This report presents the inventory results and recommends options for potential habitat improvements for coho salmon and steelhead trout. The recommendations are based on target habitat values suitable for salmonids in California's north coast streams.

Historically coho salmon have been found in Jackass Creek. An administrative report by the National Marine Fisheries Service Southwest Fisheries Science Center references a study by G. Murphy (Bureau of Fish Conservation, California Department of Fish and Game) conducted in 1948, in which coho were observed in Jackass Creek (Adams *et al.*, 1996).

Jackass Creek was surveyed by Alan Grass of the DFG during the months of August and/or September from 1963-1970 (unpublished DFG file note). Throughout this time period he reported observing yearling steelhead trout. Though a sandbar closed the outlet of Jackass Creek to the Pacific Ocean during the summer months, local residents reported "a good run" of anadromous steelhead in the winter months. No coho were reported.

Jackass Creek was sampled by electrofishing by DFG on 10/21/1983, 10/24/1985, and, 7/27-29/1987; juvenile steelhead but no coho were found (Unpublished DFG data).

### WATERSHED OVERVIEW

Jackass Creek, located in Mendocino County, California, is tributary to the Pacific Ocean (Map 1). Jackass Creek's legal description at the confluence with the Pacific Ocean is T23N R19W S01. Its mouth is located at 39°52'51" north latitude and 123°54'50" west longitude. Jackass Creek is a second order stream and has approximately 1.49 miles of blue line stream according to the USGS Bear Harbor 7.5 minute quadrangle map. Jackass Creek drains a watershed of approximately 2.73 square miles, not including the North Fork. Elevations range from about 0 feet at the mouth to 1100 feet in the headwater areas.

The legal description for North Fork Jackass Creek, at its confluence with the Jackass Creek is T23N R18W S01. This confluence is located at 39°52'6" north latitude and 123°54'38" west longitude. North Fork Jackass Creek is a first order stream and has approximately 1.2 miles of blue line stream according to the USGS Bear Harbor 7.5 minute quadrangle map. North Fork Jackass Creek drains a watershed of approximately 2.59 square miles. Elevations range from about 0 feet at the mouth to 1300 feet in the headwater areas.

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Mixed coniferous forest dominates the watershed. The lower parts of both the mainstem and north fork of Jackass Creek are in the Sinkyone Wilderness State Park. The upper reaches are owned by the InterTribal Sinkyone Wilderness Council. Past land use in the watershed included timber harvest accompanied by road building, which likely contributed to the elimination of coho salmon from Jackass Creek. The major present land uses in the watershed are scientific study and recreation in the form of hike-in camping. The Council was granted a conservation easement on its land by Pacific Forest Trust. The easement precludes any substantial future industrial logging or development. The California Department of Parks and Recreation at present has no plans for further development of its lands. There appears to be potential for the watershed to become a refuge from land uses adverse to salmon and steelhead.

Vehicle access exists via the county road 431, north of Usal. The access road to the creek is closed to the public, and controlled by the Council.

## METHODS

The habitat inventory conducted in Jackass Creek followed the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi *et al.*, 1998). A two-person team of AmeriCorps Watershed Stewards Project (WSP) members, trained in standardized habitat inventory methods by DFG, conducted the field inventory.

## HABITAT INVENTORY COMPONENTS

The standardized habitat inventory protocol has nine components:

### 1. Flow:

Flow is measured in cubic feet per second (cfs) at the bottom of the stream survey reach using standard flow measuring equipment, if available. In some cases flows are estimated.

### 2. Channel Type:

As 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.

### 3. Temperatures:

Water and air temperatures are taken in degrees Fahrenheit at the middle of the habitat unit, within one foot of the water surface.

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### **4. Habitat Unit Type and Dimensions:**

Habitat units are numbered sequentially and assigned a habitat type selected from a standard list of 24 habitat types (Appendix 1). Dewatered units are labeled "dry". The length of a described habitat unit must be equal to or greater than the stream's mean wetted width. Habitat unit dimensions of mean length, mean width, mean depth, and maximum depth are measured. In pool units, maximum depth at the pool tail crest is also measured. Measurements are taken to the nearest 1/10 foot using hip chains, measuring tapes, or stadia rods.

### **5. Embeddedness:**

Embeddedness is defined as the percent of a cobble that is surrounded or buried by fine sediment. The values are 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 is assigned to substrates deemed unsuitable for spawning due to inappropriate substrate particle size (e.g. bedrock) or other considerations. On this scale, a value of 1 indicates the highest quality of spawning substrate and a value of 5 indicates the tail crest is not suitable for spawning. Embeddedness, estimated by eye, is taken in pool habitat units at the pool tail crest.

### **6. Shelter Rating:**

Instream shelter is composed of those elements within a stream channel that provide 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. The shelter rating is calculated 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. A standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) is assigned according to the complexity of the cover. Thus shelter rating can range from 0-300.

### **7. Substrate Composition:**

Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. Dominant and sub-dominant substrate elements in the habitat unit are estimated by eye using a list of seven size classes. In addition, the dominant substrate composing the pool tail outs is recorded in pool habitat units.

### **8. Canopy:**

Canopy density relates to the amount of stream shaded from the sun. Stream canopy density in the habitat unit is estimated using a handheld spherical densiometer. In addition, the area of canopy is estimated by eye into percentages of coniferous and deciduous trees.

### **9. Streambank Substrate and Vegetation:**

Streambank substrate ranges from bedrock to silt/clay/sand, and may be covered with vegetation that enhances streambank stability. The dominant substrate type and the dominant vegetation

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type of both the right and left banks of the habitat unit are estimated by eye and recorded. Additionally, the percent of each bank covered by vegetation is estimated by eye and recorded.

### Habitat Inventory Sampling Strategy:

The sampling protocol calls for partial sampling of all habitat units within the survey reach and full sampling in approximately 10% of the habitat units. All habitat units are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail crest, dominant substrate composing the pool tail crest, and embeddedness. Habitat types encountered for the first time are fully sampled for all parameters on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for full sampling. Canopy density is recorded for every third unit, in addition to every fully described unit, giving an approximate 30% sub-sample. Air temperature, water temperature, and time of day are recorded at every tenth habitat unit (once per field form page).

## BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. In mainstem and north fork of Jackass Creek, fish presence was observed from the streambanks, and two sites were electrofished using a Smith-Root Model 12-B electrofisher. The sampling techniques are described in the *California Salmonid Stream Habitat Restoration Manual*.

## DATA ANALYSIS

Data from the habitat inventory form are entered into *Habitat*, a dBASE 4.2 data entry program developed by Tim Curtis, Inland Fisheries Division, DFG. This program processes and summarizes the data, and produces the following tables:

- Summary of riffle, flatwater, and pool habitat types
- Summary of habitat types and measured parameters
- Summary of pool types
- Summary of maximum pool depths by pool habitat types
- Summary of mean percent cover by habitat type
- Summary of dominant substrates by habitat type
- Summary of mean percent vegetative cover for entire stream
- Fish habitat inventory data summary
- Summary of streambank substrate and vegetation, and pool tail crest cobble embeddedness
- Mean percent of shelter cover types for entire stream

A standard set of graphics is produced from the tables for selected habitat parameters. Those included in this report are:

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- Riffle, flatwater, pool habitats by percent total length
- Total pools by maximum depths
- Embeddedness
- Dominant substrate in the pool tail crests

### **HABITAT INVENTORY RESULTS**

Flows were measured in neither the mainstem nor north fork of Jackass Creek.

Both the mainstem and north fork of Jackass Creek were classified as channel type B4 for the entire stream reach surveyed. B4 channels are moderately entrenched, of moderate gradient (2-4%), dominated by riffles, with mainly gravel substrate.

#### **Mainstem Jackass Creek**

Adrienne Carr and Jennifer Jenkins (WSP/AmeriCorps) conducted the habitat inventory field survey during June 14-15, 1999. The total length of stream surveyed was 6915 feet with an additional 35 feet of side channel.

Water temperatures taken during the survey period ranged from 53 to 58 degrees Fahrenheit. Air temperatures ranged from 55 to 64 degrees Fahrenheit.

Based on frequency of occurrence of Level II habitat types there were 28% riffle units, 31% flatwater units, and 40% pool units (Table 1). Based on total length of Level II habitat types there were 31% riffle units, 41% flatwater units, and 18% pool units (Table 1, Graph 2).

Nine Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pools 32%, low gradients riffles 26%, runs 14%, and step runs 14%. Based on percent total length, low gradient riffles comprised 27%, step runs 23%, runs 16%, and mid-channel pools 12%.

A total of 37 pools were identified (Table 3). Main channel pools were most frequently encountered at 97% and comprised 97% of the total length of all pools. Of the 37 pools, 19 (52%) had a depth of two feet or greater (Table 4, Graph 5).

A primary pool is defined as a pool with a maximum depth of at least 2 feet, occupies at least half the width of the low flow channel, and is as long as the low flow channel width. In mainstem Jackass Creek, primary pools totaled 850 feet, or 12% of the total stream surveyed.

Of the 37 pool tail crest embeddedness estimates, none had a value of 1, 13 had a value of 2 (35%), 20 had a value of 3 (54%), 1 had a value of 4 (3%), and 3 had a value of 5 (8%) (Table 8, Graph 6). The 3 pool tail crests with an embeddedness value of 5 were rated unsuitable for spawning due to substrate composed of wood or boulder.

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Riffle habitat types had a mean shelter rating of 32, flatwater habitat types had a mean shelter rating of 38, and pool habitats had a mean shelter rating of 11 (Table 1). Mid-channel pools, the dominant pool type, had a mean shelter rating of 7 (Table 2).

Cover in mainstem Jackass Creek was provided mainly by a mix of undercut banks, small and large woody debris, terrestrial vegetation, bubble curtains, and some root masses (Table 5). Undercut banks, small and large woody debris, and root masses provided the main cover in pools (Table 10).

Gravel was most commonly the dominant substrate in the main habitat types (Table 6). Of the 4 low gradient riffles and the 2 step runs fully measured, all were dominated by gravel. Of the 2 runs fully measured, 1 was dominated by gravel and 1 by small cobble. Of the 3 mid-channel pools fully measured, 2 were dominated by gravel and 1 by boulder. Gravel was the dominant pool tail crest substrate in 32 of the 37 pool units (86%), followed by small cobble and wood (each with 5%) (Graph 8).

The mean percent canopy density for the stream reach surveyed was 90%, with deciduous and coniferous trees comprising 77% and 13%, respectively (Table 7).

Sand/silt/clay dominated the streambank substrate in 56% of the fully measured units, followed by cobble/gravel dominating in 44% (Table 9). In the fully measured units, right streambanks had a mean vegetative cover of 100%. Left streambanks had a mean vegetative cover of 98% (Table 7). Streambank vegetation was mainly composed of deciduous trees (65%), followed by coniferous trees and grass (each with 13%), and brush (9%) (Table 9).

## **North Fork Jackass Creek**

Adrienne Carr and Jennifer Jenkins (WSP/AmeriCorps) conducted the habitat inventory field survey during June 16-17, 1999. Adrienne Carr and Douglas Albin (DFG) completed the survey on July 8, 1999. The total length of stream surveyed was 10,214 feet.

Water temperatures taken during the survey period ranged from 54 to 57 degrees Fahrenheit. Air temperatures ranged from 55 to 65 degrees Fahrenheit.

Based on frequency of occurrence of Level II habitat types there were 33% riffle units, 19% flatwater units, and 48% pool units (Table 1). Based on total length of Level II habitat types there were 38% riffle units, 30% flatwater units, and 32% pool units (Table 1, Graph 2).

Ten Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were mid-channel pools 46%, low gradients riffles 31%, and step runs 10%. Based on percent total length, low gradient riffles comprised 34%, mid-channel pools 30%, and step runs 16%.

A total of 106 pools were identified (Table 3). Main channel pools were most frequently encountered at 98% and comprised 98% of the total length of all pools. Of the 106 pools, 50 (47%) had a depth of two feet or greater (Table 4, Graph 5).

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In North Fork Jackass Creek, primary pools totaled 1578 feet, or 15% of the total stream surveyed.

Of the 37 pool tail crest embeddedness estimates, 12 had a value of 1 (11%), 58 had a value of 2 (55%), 21 had a value of 3 (20%), none had a value of 4, and 15 had a value of 5 (14%) (Table 8, Graph 6). The 15 pool tail crests with an embeddedness value of 5 were rated unsuitable for spawning due to substrate composed of boulder, bedrock, wood, or large cobble.

Riffle habitat types had a mean shelter rating of 55, flatwater habitat types had a mean shelter rating of 21, and pool habitats had a mean shelter rating of 12 (Table 1). Mid-channel pools, the dominant pool type, had a mean shelter rating of 8 (Table 2).

Cover in North Fork Jackass Creek was provided mainly by a mix of undercut banks, small and large woody debris, root masses, and some terrestrial vegetation (Table 5). Undercut banks, small and large woody debris, and root masses provided the main cover in pools (Table 10).

Gravel was the dominant substrate in the main habitat types (Table 6). Of the 8 low gradient riffles, the 2 high gradient riffles, and the one run fully measured, all were dominated by gravel. Of the 4 step runs fully measured 2 were dominated by gravel and 2 by large cobble. Of the 11 mid-channel pools fully measured, 9 were dominated by gravel, 1 by sand, and 1 by large cobble. Gravel was the dominant pool tail crest substrate in 87 of the 106 pool units (82%), followed by boulder (5%), and then small cobble, bedrock, and wood (each with 4%) (Graph 8).

The mean percent canopy density for the stream reach surveyed was 92%, with deciduous and coniferous trees comprising 76% and 36%, respectively (Table 7).

Sand/silt/clay dominated the streambank substrate in 47% of the fully measured units, followed by cobble/gravel dominating in 45%. Other values were bedrock 5% and boulder 3% (Table 9). In the fully measured units, right streambanks had a mean vegetative cover of 94%. Left streambanks had a mean vegetative cover of 97% (Table 7). Streambank vegetation was mainly composed of deciduous trees (55%), followed by coniferous trees (34%) and brush (11%) (Table 9).

## **BIOLOGICAL INVENTORY RESULTS**

Two sites were electrofished on July 9, 1999, one each in the mainstem and north fork of Jackass Creek. Douglas Albin (DFG) and Adrienne Carr (WSP/AmeriCorps) sampled these sites.

In the mainstem of Jackass Creek, habitat unit 29 was sampled. This site is a mid-channel pool measuring 30 feet in length. The site yielded six steelhead and one coast range sculpin.

In North Fork Jackass Creek, unit 38 was sampled. This site was also a mid-channel pool and measured 26 feet long. This site yielded 11 steelhead and one coast range sculpin.

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At both locations, juvenile steelhead (young-of-year and older age classes) were readily observed from the stream banks, with about 10 to 50 fish per pool. Juvenile steelhead were also frequently observed during the habitat survey. The juvenile steelhead in Jackass Creek have unusually vivid coloring compared to fish from other coastal watersheds.

## **DISCUSSION**

The suitability of B4 channel types such as the mainstem and north fork of Jackass Creek for fish habitat improvement structures is: excellent for low-stage plunge weirs, boulder clusters, bank-placed boulders, single and opposing wing deflectors, and log cover. Numerous locations show evidence that the creek is downcutting through debris slide material, and is thus recovering from past land use practices. This kind of recovery is evident on numerous north coast streams purging themselves of excess sediment.

Water temperatures, for the mainstem and north fork of Jackass Creek, recorded on the survey days were within the suitable ranges for rearing of coho salmon and steelhead. But since the maximum temperatures recorded (58 and 57 degrees Fahrenheit) are near to the upper limits of suitability, continuous monitoring of temperature throughout the warm season would be needed to verify temperature suitability. Given Jackass Creek's location in the coastal fog belt and the high canopy density found, it is doubtful that stream temperatures are unsuitable for coho or steelhead.

For mainstem Jackass Creek, flatwater habitat types comprised 31% of the total length of this survey, riffles 41%, and pools 18% (Table 1, Graph 2). Primary pools composed 12% of the total length surveyed. For North Fork Jackass Creek, flatwater habitat types comprised 38% of the total length of this survey, riffles 30%, and pools 32% (Table 1, Graph 2). Primary pools composed 15% of the total length surveyed. DFG data indicate that the better coastal coho streams have as much as 40% of their total habitat length in primary pools. Pool enhancement should be considered when primary pools comprise less than that percentage, which is the case for both the mainstem and north fork of Jackass Creek. The North Fork has a somewhat higher pool frequency than the main stem.

The mean shelter ratings for flatwater, riffle, and especially pool habitats in both the mainstem and north fork of Jackass Creek are all much below the desirable rating of 100 (Tables 1 and 2).

The prevalence of gravel (86% in the mainstem and 83% in the north fork) as the dominant pool tail crest substrate is generally considered suitable for spawning salmonids (Table 6, Graph 8). However, frequencies of embeddedness ratings of 2, 3, or 4 (Table 8) in the mainstem of Jackass Creek indicate lower spawning substrate quality due to the presence of fine sediments. Slightly higher quality is found in the north fork than the mainstem.

The mean percent canopy densities for the both the mainstem and the north fork are very high, as are the percentages of right and left bank vegetative cover, indicating low priority for streambank and riparian revegetation efforts.



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No coho salmon were found in either of the habitat units electrofished, indicating that juvenile coho were absent from both the mainstem and north fork of Jackass Creek in 1999.

### RECOMMENDATIONS

- 1) Jackass Creek should be managed as an anadromous, natural production stream. If habitat conditions sufficiently recover, consideration should be given to introduction of a compatible strain of coho salmon.
- 2) Active and potential sediment delivery from roads and other sources in the watershed should be identified, mapped, and quantified. Sources should be treated according to their potential for sediment yield to the stream and its tributaries. This kind of source control will hasten stream recovery from excess sedimentation.
- 3) Greatly increase instream wood to improve shelter rating, help sort sediments, and increase the depths of existing pools.

### 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.

#### **Mainstem Jackass Creek**

Position  
(ft):

Comment:

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- |      |   |
|------|---|
| 0    | Start of survey at the confluence with the Pacific Ocean. The beginning was not surveyed due to the estuary. Observed many out-migrating smolts in estuary. |
| 1085 | Several 1+ salmonids out-migrating. Young-of-the-year (YOY) salmonids observed, too. Pea gravel is the dominant substrate.                                  |
| 1180 | Deepest point at small eddy on left bank.   |
| 2005 | More YOY observed.  |
| 2051 | Left bank log enhancement project forming pool. Left bank composition is wood.  |
| 2160 | Confluence of North Fork Jackass Creek and Jackass Creek at the end of unit. Campsite in between.   |
| 2235 | Trail crossing.   |
| 2252 | Old mill remains on left bank.  |

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- 2374 1+ observed in this unit. 1.5' undercut bank. Log bank stabilization to end of unit. Campground on left bank.
- 2773 Road crossing.
- 3037 Black, one foot diameter unscreened pipe floating in creek.
- 3457 Side channel enters right bank. Tributary enters on left bank. Large debris accumulation (LDA) measures 5'high x 7'long x 20' wide.
- 3567 2' undercut bank/rootwad.
- 3601 3' undercut bank. Right bank-digger log 1.5' above water, at end of unit.
- 4376 3' left bank digger logs.
- 4566 2.5' undercut bank & rootwad.
- 4823 State park boundary. Instream structure.
- 4910 Series of step pools (5 total) with approximately 2' jumps and low-flow notches cut out. Two old growth digger logs and six bank stabilizing logs on right bank in fourth pool.
- 5119 1.5' undercut bank.
- 5203 LDA measures 30' wide x 5' high x 6' long, blocking much of flow. 3' diameter, 15' long corrugated metal pipe lodged in LDA. Water cascades out of most of the left bank section of LDA. 5' high sediment back-up. NGF flag at top of LDA. (see data sheets for picture)
- 5217 Toe of old slide on left bank at beginning of unit.
- 5341 YOY and 1+ observed.
- 5657 LDA out of channel. NGF flag.
- 5754 Hardwood/conifer mixed riparian.
- 5895 Right bank log bank stabilization (cradle). 4' undercut beneath right bank stabilizers. Plunge pool created by other instream structures. 4' jump from water surface. (see data sheets for picture)
- 5917 Tail crest at plunge forms unit 61.
- 5942 Log weir with low-flow notch creating the pool at the end of unit.

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- 5984 Left bank structure rootwad accumulating debris and providing shelter, located at end of unit.
- 6074 Channel type taken. Left bank rebar, wood, and fabric bank stabilization.
- 6157 At end of unit, another log weir/low-flow formed pool. Fish observed. Step pool structures again. Each log weir with low-flow notch creating pool. Four pools total. Each pool has other recruited/cabled/old growth structures on either bank. The third pool has accumulated several pieces of failed structures as well as other debris. Log weir structuring creating very deep pools with lots of excellent cover. Flag: "existing # 9 1383' NGF 6/30/98" at end of unit.
- 6267 Non-functioning log weir/low-flow piece.
- 6316 Lots of fish. LDA at end of unit measures 5' wide x 4' long x 2' high.
- 6332 Left bank tributary enters at end of unit.
- 6383 YOY observed.
- 6459 Small debris accumulation measures 20' wide x 2' long x 2' high, at end of unit creating pool.
- 6542 LDA measures 6' high x 30' wide x 70' long. Water flows through/under.
- 6703 More log weir structures forming pools, three pools total. First two have additional right bank/left bank structures. Flag at end of unit "# 14 existing 1957' NGF 6/30/98"
- 6794 Log weir forming pool. YOY observed. 2' undercut bank.
- 6847 More of the same log weir structures. 1st pool has a 4' high jump. Same bank stabilization additional structures, mainly on right bank. 3rd pool has another 4' high jump.
- 6905 Lots of debris hanging over channel. LDA covers entire unit. Rip-rap on left bank. Log weir across channel with 2' high jump.
- 7007 Weir/dam at end of unit. 3' high jump (see data sheets for picture).
- 7039 Tributary enters on left bank.
- 7193 YOY observed. Two step pools with large debris accumulation separated them. Flag marked "improve access NGF 6/30/98"

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- 7381 6' high jump at end of unit. Water flows through crack; probably flows over in high flows. Not ending survey yet, walking/surveying and looking for fish. Channel flattens out above jam/jump.
- 7458 Right bank seep. Fish observed.
- 7539 Cable floating at end of unit.
- 7580 LDA at beginning of unit and extends over entire unit. Most of it is suspended above the wetted channel. One huge (8' diameter) old growth redwood spanning the channel through most of this unit and 20' or so into the next one.
- 7697 LDA with old growth redwood. 3' deep sediment back-up. Water flows under and through. At upstream end of LDA there is only a 3" tall gap where water flows through.
- End of survey: the large debris accumulation's upstream side has only a small opening in which fish could possibly pass. There are mass amounts of small woody debris caught up on the LDA. No fish have been observed since small puddle at beginning of unit 91. We walked upstream a couple hundred feet. No fish were observed. Channel almost choked with debris.

## North Fork Jackass Creek

Position  
(ft):

Comment:

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- 0 Begin survey at confluence of the North Fork Jackass Creek and mainstem Jackass Creek. This channel confluence pool corresponds to habitat unit 17 in the mainstem Jackass Creek survey. Campsite at end of unit on left bank. Wheeler campground on left bank.
- 286 2-3' undercut banks.
- 348 Wheeler campground still on left bank.
- 430 Small debris accumulation helping form pool.
- 444 YOY observed.
- 539 Rootwad and digger log creating pool.
- 589 2.5' undercut bank. Small debris accumulation.

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- 728 Right bank erosion. Campground ends after this unit. 1+ fish observed, too. 15 fish at least in this pool. Downed alder root accumulating debris & providing good shelter.
- 854 YOY observed.
- 899 Channel type taken here.
- 948 YOY and 1+ fish observed.
- 1038 YOY/1+ observed. Small debris accumulation providing good cover.
- 1488 YOY/1+ observed. 2' undercut bank.
- 1829 YOY observed. Old growth burnt log forming pool.
- 1918 Rootwad forming pool, creating steps on left bank.
- 2012 Pea gravel in tail crest. YOY/1+ observed. Right bank campsite.
- 2038 1' undercut bank. Campsite on right bank.
- 2108 1+/YOY observed. Unit is actually two pools separated by a 3' long x 10' wide riffle. Good shelter.
- 2299 YOY observed. Old redd in tail crest.
- 2619 Small debris accumulation over unit.
- 2695 YOY/1+ observed. Small debris accumulation over 80% of unit, providing good shelter.
- 2758 Old growth redwood and trunk embedded in left bank.
- 2891 YOY/1+ observed.
- 3002 Really like two units in one, but not really a side channel. Riffle from unit 56 continues on right bank and large debris accumulation creates pool on left bank, holding 1' sediment and forming large island. (see data sheets for picture)
- 3218 YOY/1+ observed.
- 3267 4' high jump at end of unit. Tributary on left bank.
- 3288 Small debris accumulation over 50% of unit.
- 3326 YOY observed.

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- 3445 YOY/1+ seen observed.
- 3576 Four pieces of large woody debris in pool. YOY observed.
- 3672 YOY observed.
- 3734 YOY/1+ observed. Large debris accumulation (LDA) measures 12' long x 20' wide x 4' high.
- 3795 Logs/cable- failed structure. Looks like it was a step run.
- 3920 YOY/1+ observed.
- 3947 LDA measures 41' long x 8' high x 20' wide, at beginning of unit, mostly on right bank. 3' deep sediment back-p on right bank. Sediment measures 58' long x 4' high in places.
- 4012 LDA at beginning of unit measures 15' long x 8' high x 25' wide. Fish observed above the LDA. Notched wood structure piece in LDA. Creek makes a 90 degree turn above. (see data sheets for picture)
- 4211 LDA measures 22' long x 9' high x 15' wide.
- 4284 1+ fish observed. 2.5' undercut bank. Log weir creating pool.
- 4621 YOY observed. 5' undercut bank in small section.
- 4763 YOY observed.
- 4814 East Branch of North Fork Jackass Creek enters on left bank.
- 4828 YOY observed. LDA at end of unit measures 10' high x 25' wide x 30' long. 2' deep sediment above. Water goes underground in three separate places.
- 5707 2' undercut bank.
- 6122 Lots of sand settled in pool.
- 6155 YOY observed.
- 6289 Left bank old growth redwood providing good shelter. YOY observed.
- 6335 Two pools. Second one has 4.5' high jump. Right bank of second pool is very steep, practically vertical & eroding. Old road on right bank. Stumps & cut rounds floating in pool.

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- 6379 Fish observed above jump. Flag marked: "end survey 8/23/93 ITSWC." 1.5' undercut bank.
- 6511 1+/YOY observed. LDA measures 11' long x 25' wide x 9' high. Water runs under. Many old growth, moss covered pieces in jam. 1.5' sediment on right bank behind LDA.
- 6704 1.5' jump at end of unit. 3' undercut banks.
- 7087 Two pools. Two 2' high jumps in between.
- 7317 2.5' high jump at end.
- 7360 YOY observed.
- 7405 YOY observed.
- 7506 Two old growth redwoods at beginning of unit. 3' high jump at the end.
- 7529 Gradient increasing, more boulders.
- 7638 YOY observed. LDA begins, it ends at the end of unit. Not as much of a log jam as it is trees from left bank slide. Most of debris is suspended over channel.
- 8642 Undercut bank, approximately 2' plunge pool.
- 8926 LDA, mostly on left bank side of creek, measures 20' long x 20' wide x 10' high. About 40 cubic yards of gravel accumulated behind jam. Bunch of old growth in LDA.
- 9054 YOY and 1+ observed. Right bank- steep banks are sliding.
- 9086 Right bank- bedrock.
- 9285 Very steep climb to next unit (plunge pool).
- 9323 Plunge pool formed by large boulders.
- 9337 YOY observed. 3' high jump.
- 9434 Jump to next unit is 3'.
- 9516 YOY observed in pool. Half of pool is plunging.
- 9524 YOY and 1+ observed.
- 9621 LDA measures 12' long x 4' high x 20' wide.

## Jackass Creek

- 9657 LDA, mostly on left bank side, measures 25' long x 10' wide x 4' high. 2' undercut bank, nice shelter with large wood, too.
- 9803 YOY observed.
- 9824 YOY observed.
- 9912 4' high plunge.
- 9939 LDA measures 50' long x 25' wide x 6' high.
- 10,040 LDA measures 22' long x 8' high x 25' wide. Fish passage under.
- 10,052 Creek flattens out.
- 10,182 LDA measures 15' wide x 3' high.
- 10,194 End of survey. Survey called after this unit. Gradient is increasing. One fish was seen within 100 yards and it was >5" long, assumed to be resident. Saw many prime habitat pools that are uninhabited. No fish seen since unit 214 at 4' jump over bedrock.

End notes - most of creek looks like it is downcutting/ flowing through historic debris slide material. In a few places, there were two different definable layers of debris packed on the banks. The creek is running through a valley that has experienced much infilling from debris slides - most likely caused by logging/road building (?). There are remnants of a road along the left bank - it is over 100 ft away from the creek most of the way. It ascends above the creek fairly high before it crosses the east branch. It continues to ascend after this. It is only a trail now.

Historically, work was done beyond survey end. saw flagging (orange) and bunched up wood on hillslope - this was Department of Fish and Game large woody debris removal phase - wood was cut up to keep it out of the stream. Saw some others on the previous two pages as well (20 units).

## REFERENCES

Adams, P. *et al.* 1996. *Historical and Current Presence-Absence Data of Coho Salmon (Oncorhynchus kisutch) in the Central California Evolutionary Significant Unit*. National Marine Fisheries Service Southwest Fisheries Science Center, Administrative Report T-96-01. Tiburon, California. 24 p.

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



## Jackass Creek

### Appendix 1: HABITAT TYPE KEY

<u>LEVEL II</u>	<u>LEVEL III</u>	<u>LEVEL IV</u>	
<i>Name</i>	<i>Name</i>	<i>Name</i>	<i>Letter, Number</i>
RIFFLE	Riffle	Low Gradient Riffle	[LGR] 1.1
		High Gradient Riffle	[HGR] 1.2
	Cascade	Cascade	[CAS] 2.1
		Bedrock Sheet	[BRS] 2.2
FLATWATER	Flatwater	Pocket Water	[POW] 3.1
		Glide	[GLD] 3.2
		Run	[RUN] 3.3
		Step Run	[SRN] 3.4
		Edgewater	[EDW] 3.5
POOL	Main Channel Pool	Trench Pool	[TRP] 4.1
		Mid-Channel Pool	[MCP] 4.2
		Channel Confluence Pool	[CCP] 4.3
		Step Pool	[STP] 4.4
	Scour Pool	Corner Pool	[CRP] 5.1
		Lateral Scour Pool - Log Enhanced	[LSL] 5.2
		Lateral Scour Pool - Root Wad Enhanced	[LSR] 5.3
		Lateral Scour Pool - Bedrock Formed	[LSBk] 5.4
		Lateral Scour Pool - Boulder Formed	[LSBo] 5.5
		Plunge Pool	[PLP] 5.6
	Backwater Pool	Secondary Channel Pool	[SCP] 6.1
		Backwater Pool - Boulder Formed	[BPB] 6.2
		Backwater Pool - Root Wad Formed	[BPR] 6.3
		Backwater Pool - Log Formed	[BPL] 6.4
		Dammed Pool	[DPL] 6.5



JACKASS CREEK

Drainage: PACIFIC OCEAN

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES

Survey Dates: 06/14/99 to 06/15/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR19WS01 LATITUDE:39°52'51" LONGITUDE:123°54'50"

HABITAT	UNITS	HABITAT	HABITAT	MEAN	TOTAL	PERCENT	MEAN	MEAN	MEAN	ESTIMATED	MEAN	ESTIMATED	MEAN	MEAN
UNITS	FULLY	TYPE	PERCENT	LENGTH	LENGTH	TOTAL	WIDTH	DEPTH	AREA	TOTAL	VOLUME	TOTAL	RESIDUAL	SHELTER
	MEASURED		OCCURRENCE	(ft.)	(ft.)	LENGTH	(ft.)	(ft.)	(sq.ft.)	AREA	(cu.ft.)	VOLUME	POOL VOL	RATING
										(sq.ft.)		(cu.ft.)	(cu.ft.)	
26	5	RIFFLE	28	92	2396	31	11.4	0.4	669	17393	340	8845	0	32
29	5	FLATWATER	31	110	3184	41	9.8	0.6	1322	38339	822	23849	0	38
37	37	POOL	40	37	1370	18	14.0	1.2	513	18993	720	26656	493	11
TOTAL	TOTAL				TOTAL LENGTH					TOTAL AREA		TOTAL VOL.		
UNITS	UNITS				(ft.)					(sq. ft.)		(cu. ft.)		
92					6950					74725		59350		

JACKASS CREEK

Drainage: PACIFIC OCEAN

Table 2 - SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS

Survey Dates: 06/14/99 to 06/15/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR19WS01 LATITUDE:39°52'51" LONGITUDE:123°54'50"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT OCCURRENCE	MEAN LENGTH	TOTAL LENGTH	TOTAL LENGTH	MEAN WIDTH	MEAN DEPTH	MEAN MAXIMUM DEPTH	MEAN AREA	TOTAL AREA	MEAN VOLUME EST.	TOTAL VOLUME EST.	MEAN RESIDUAL POOL VOL	MEAN SHELTER RATING	MEAN CANOPY
#			%	ft.	ft.	%	ft.	ft.	ft.	sq.ft.	sq.ft.	cu.ft.	cu.ft.	cu.ft.		%
24	4	LGR	26	87	2088	27	12	0.4	1.1	526	12625	208	4994	0	23	95
2	1	HGR	2	154	308	4	11	0.7	1.2	1241	2482	869	1737	0	70	95
3	1	GLD	3	50	150	2	12	0.7	1.3	528	1584	370	1109	0	10	95
13	2	RUN	14	93	1211	16	8	0.6	1.0	1390	18071	802	10425	0	45	78
13	2	SRN	14	140	1823	23	11	0.7	1.2	1651	21463	1069	13900	0	45	92
30	30	MCP	32	30	905	12	14	1.2	3.8	406	12193	477	14313	308	7	90
1	1	CCP	1	59	59	1	13	1.3	2.6	767	767	997	997	614	10	93
5	5	STP	5	72	360	5	16	1.8	4.5	1096	5481	2126	10628	1576	27	93
1	1	LSL	1	46	46	1	12	1.3	2.1	552	552	718	718	497	50	96

TOTAL UNITS	TOTAL UNITS	LENGTH (ft.)	AREA (sq.ft)	TOTAL VOL. (cu.ft)
92	47	6950	75217	58821

JACKASS CREEK

Drainage: PACIFIC OCEAN

Table 3 - SUMMARY OF POOL TYPES

Survey Dates: 06/14/99 to 06/15/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR19WS01 LATITUDE:39°52'51" LONGITUDE:123°54'50"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA EST. (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME EST. (cu.ft.)	MEAN RESIDUAL POOL VOL. (cu.ft.)	MEAN SHELTER RATING
36	36	MAIN	97	37	1324	97	14.1	1.2	512	18441	721	25938	493	10
1	1	SCOUR	3	46	46	3	12.0	1.3	552	552	718	718	497	50
TOTAL UNITS	TOTAL UNITS				TOTAL LENGTH (ft.)				TOTAL AREA (sq.ft.)		TOTAL VOL. (cu.ft.)			
37	37				1370				18993		26656			

JACKASS CREEK

Drainage: PACIFIC OCEAN

Table 4 - SUMMARY OF MAXIMUM POOL DEPTHS BY POOL HABITAT TYPES

Survey Dates: 06/14/99 to 06/15/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR19WS01 LATITUDE:39°52'51" LONGITUDE:123°54'50"

UNITS MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	<1 FOOT MAXIMUM DEPTH	<1 FOOT PERCENT OCCURRENCE	1-<2 FT. MAXIMUM DEPTH	1-<2 FOOT PERCENT OCCURRENCE	2-<3 FT. MAXIMUM DEPTH	2-<3 FOOT PERCENT OCCURRENCE	3-<4 FT. MAXIMUM DEPTH	3-<4 FOOT PERCENT OCCURRENCE	>=4 FEET MAXIMUM DEPTH	>=4 FEET PERCENT OCCURRENCE
30	MCP	81	0	0	17	57	10	33	3	10	0	0
1	CCP	3	0	0	0	0	1	100	0	0	0	0
5	STP	14	0	0	1	20	0	0	2	40	2	40
1	LSL	3	0	0	0	0	1	100	0	0	0	0

TOTAL

UNITS

37

JACKASS CREEK

Drainage: PACIFIC OCEAN

Table 5 SUMMARY OF MEAN PERCENT COVER BY HABITAT TYPE

Survey Dates: 06/14/99 to 06/15/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR19WS01 LATITUDE:39°52'51" LONGITUDE:123°54'50"

UNITS	UNITS	HABITAT	MEAN %	MEAN %	MEAN %	MEAN %	MEAN %	MEAN %	MEAN %	MEAN %	MEAN %
MEASURED	FULLY	TYPE	UNDERCUT	SWD	LWD	ROOT	TERR.	AQUATIC	WHITE	BOULDERS	BEDROCK
	MEASURED		BANKS			MASS	VEGETATION	VEGETATION	WATER		LEDGES
24	4	LGR	9	14	15	6	21	0	30	5	0
2	1	HGR	0	15	15	10	0	0	20	40	0
3	1	GLD	0	15	75	0	10	0	0	0	0
13	2	RUN	0	25	15	0	25	5	5	25	0
13	2	SRN	40	10	30	15	0	0	0	5	0
30	3	MCP	15	35	18	10	12	0	5	5	0
1	1	CCP	0	0	0	80	0	20	0	0	0
5	1	STP	30	5	45	5	0	0	15	0	0
1	1	LSL	30	0	70	0	0	0	0	0	0

JACKASS CREEK

Drainage: PACIFIC OCEAN

Table 6 SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE

Survey Dates: 06/14/99 to 06/15/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR19WS01 LATITUDE:39°52'51" LONGITUDE:123°54'50"

TOTAL HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	% TOTAL SILT/CLAY DOMINANT	% TOTAL SAND DOMINANT	% TOTAL GRAVEL DOMINANT	% TOTAL SM COBBLE DOMINANT	% TOTAL LG COBBLE DOMINANT	% TOTAL BOULDER DOMINANT	% TOTAL BEDROCK DOMINANT
24	4	LGR	0	0	100	0	0	0	0
2	1	HGR	0	0	0	0	0	100	0
3	1	GLD	0	0	100	0	0	0	0
13	2	RUN	0	0	50	50	0	0	0
13	2	SRN	0	0	100	0	0	0	0
30	3	MCP	0	0	67	0	0	33	0
1	1	CCP	0	0	100	0	0	0	0
5	1	STP	0	0	0	100	0	0	0
1	1	LSL	0	0	100	0	0	0	0



**TABLE 7**

**JACKASS CREEK**

**Summary of Mean Percent Vegetative Cover for Entire Stream**

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Deciduous	Mean Percent Open Units	Mean Right Bank Percent Cover	Mean Left Bank Percent Cover
90	15	85	2	100	98

**Note:** Mean percent conifer and deciduous 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: JACKASS CREEK

SAMPLE DATES: 06/14/99 to 06/15/99

STREAM LENGTH: 7750 ft.

LOCATION OF STREAM MOUTH:

USGS Quad Map: BEARHARBOR

Latitude: 39°52'51"

Legal Description: T23NR19WS01

Longitude: 123°54'50"

## SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

### STREAM REACH 1

Channel Type: B4

Channel Length: 6915 ft.

Riffle/flatwater Mean Width: 11 ft.

Total Pool Mean Depth: 1.3 ft.

Base Flow: 0.0 cfs

Water: 053- 058°F Air: 055-064°F

Dom. Bank Veg.: Deciduous Trees

Vegetative Cover: 99%

Dom. Bank Substrate: Silt/Clay/Sand

Canopy Density: 90%

Coniferous Component: 15%

Deciduous Component: 85%

Pools by Stream Length: 19%

Pools >=3 ft.deep: 19%

Mean Pool Shelter Rtn: 69

Dom. Shelter: Large Woody Debris

Occurrence of LOD: 26%

Dry Channel: 0 ft.

Embeddness Value: 1. 0%    2. 35%    3. 54%    4. 3%    5. 8%

Length of stream section not surveyed within survey reach  
and not included in above totals or calculations: 835 ft.

**TABLE 9****JACKASS CREEK****Mean Percentage of Dominant Substrate**

Dominant Class of Substrate	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Bedrock	0	0	0
Boulder	0	0	0
Cobble/Gravel	8	6	43.75
Silt/clay	8	10	56.25

**Mean Percentage of Dominant Vegetation**

Dominant Class of Vegetation	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Grass	1	3	12.50
Brush	1	2	9.38
Decid. Trees	11	10	65.63
Conif. Trees	3	1	12.50
No Vegetation	0	0	0

Total stream average embeddedness value for pool

2.83

TABLE 10. MEAN PERCENT OF SHELTER COVER TYPES FOR ENTIRE STREAM

Stream: JACKASS CREEK

Drainage: PACIFIC OCEAN

Survey Date: 06/14/99 to 06/15/99

	RIFFLES	FLATWATER	POOLS
UNDERCUT BANKS	13.75	16	17.50
SMALL WOODY DEBRIS	16.56	17	18.33
LARGE WOODY DEBRIS	25.63	33	28.33
ROOTS	11.25	6	19.17
TERRESTRIAL VEG	11.25	12	5.83
AQUATIC VEG	1.88	2	3.33
WHITEWATER	11.25	2	5
BOULDERS	8.44	12	2.50
BEDROCK LEDGES	0	0	0

NORTH FORK JACKASS CREEK

Drainage: JACKASS CREEK

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES

Survey Dates: 06/16/99 to 07/08/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR18WS1 LATITUDE:39°53'6" LONGITUDE:123°54'38"

HABITAT	UNITS	HABITAT	HABITAT	MEAN	TOTAL	PERCENT	MEAN	MEAN	MEAN	ESTIMATED	MEAN	ESTIMATED	MEAN	MEAN
UNITS	FULLY	TYPE	PERCENT	LENGTH	LENGTH	TOTAL	WIDTH	DEPTH	AREA	TOTAL	VOLUME	TOTAL	RESIDUAL	SHELTER
	MEASURED		OCCURRENCE	(ft.)	(ft.)	LENGTH	(ft.)	(ft.)	(sq.ft.)	AREA	(cu.ft.)	VOLUME	POOL VOL	RATING
										(sq.ft.)		(cu.ft.)	(cu.ft.)	
74	10	RIFFLE	33	53	3930	38	9.7	0.4	406	30051	192	14214	0	55
41	6	FLATWATER	19	74	3028	30	7.0	0.4	569	23324	229	9388	0	21
106	106	POOL	48	31	3256	32	10.8	1.0	331	35038	343	36354	238	12
					TOTAL LENGTH					TOTAL AREA		TOTAL VOL.		
					(ft.)					(sq. ft.)		(cu. ft.)		
					10214					88413		59956		

NORTH FORK JACKASS CREEK

Drainage: JACKASS CREEK

Table 2 SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS

Survey Dates: 06/16/99 to 07/08/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR18WS1 LATITUDE:39°53'6" LONGITUDE:123°54'38"

HABITAT	UNITS	HABITAT	HABITAT	MEAN	TOTAL	TOTAL	MEAN	MEAN	MAXIMUM	MEAN	TOTAL	MEAN	TOTAL	MEAN	MEAN	MEAN
UNITS	FULLY	TYPE	OCCURRENCE	LENGTH	LENGTH	LENGTH	WIDTH	DEPTH	DEPTH	AREA	AREA	VOLUME	VOLUME	RESIDUAL	SHELTER	CANOPY
MEASURED											EST.		EST.	POOL	RATING	
#			%	ft.	ft.	%	ft.	ft.	ft.	sq.ft.	sq.ft.	cu.ft.	cu.ft.	cu.ft.		%
68	8	LGR	31	51	3481	34	10	0.4	1.1	354	24104	118	7995	0	34	94
6	2	HGR	3	75	449	4	8	0.8	2.2	613	3676	490	2941	0	135	99
6	1	GLD	3	56	333	3	8	0.7	1.3	360	2160	252	1512	0	10	92
14	1	RUN	6	75	1048	10	9	0.4	0.8	1847	25855	739	10342	0	40	86
21	4	SRN	10	78	1647	16	6	0.3	1.0	302	6334	96	2012	0	19	91
101	101	MCP	46	30	3063	30	11	1.0	3.9	319	32200	334	33687	233	8	90
1	1	CCP	0	70	70	1	15	0.9	2.5	1050	1050	945	945	420	10	97
2	2	STP	1	34	67	1	12	1.1	2.2	377	753	423	846	289	75	100
1	1	LSL	0	36	36	0	28	0.7	2.4	655	655	459	459	262	180	98
1	1	LSR	0	20	20	0	20	1.1	2.7	380	380	418	418	342	100	70
										AREA		TOTAL VOL.				
										(sq.ft.)		(cu.ft.)				
										10214		97167		61156		

NORTH FORK JACKASS CREEK

Drainage: JACKASS CREEK

Table 3 - SUMMARY OF POOL TYPES

Survey Dates: 06/16/99 to 07/08/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR18WS1 LATITUDE:39°53'6" LONGITUDE:123°54'38"

HABITAT	UNITS	HABITAT	HABITAT	MEAN	TOTAL	PERCENT	MEAN	MEAN	MEAN	TOTAL	MEAN	TOTAL	MEAN	MEAN
UNITS	FULLY	TYPE	PERCENT	LENGTH	LENGTH	TOTAL	WIDTH	DEPTH	AREA	AREA	VOLUME	VOLUME	RESIDUAL	SHELTER
	MEASURED		OCCURRENCE	(ft.)	(ft.)	LENGTH	(ft.)	(ft.)	(sq.ft.)	(sq.ft.)	(cu.ft.)	(cu.ft.)	POOL VOL.	RATING
104	104	MAIN	98	31	3200	98	10.6	1.0	327	34003	341	35478	236	9
2	2	SCOUR	2	28	56	2	24.0	0.9	518	1035	438	877	302	140
TOTAL	TOTAL				TOTAL LENGTH				TOTAL AREA		TOTAL VOL.			
UNITS	UNITS				(ft.)				(sq.ft.)		(cu.ft.)			
106	106				3256				35038		36354			

NORTH FORK JACKASS CREEK

Drainage: JACKASS CREEK

Table 4 SUMMARY OF MAXIMUM POOL DEPTHS BY POOL HABITAT TYPES

Survey Dates: 06/16/99 to 07/08/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR18WS1 LATITUDE:39°53'6" LONGITUDE:123°54'38"

UNITS	HABITAT	HABITAT	<1 FOOT	<1 FOOT	1-<2 FT.	1-<2 FOOT	2-<3 FT.	2-<3 FOOT	3-<4 FT.	3-<4 FOOT	>=4 FEET	>=4 FEET
MEASURED	TYPE	PERCENT	MAXIMUM	PERCENT	MAXIMUM	PERCENT	MAXIMUM	PERCENT	MAXIMUM	PERCENT	MAXIMUM	PERCENT
		OCCURRENCE	DEPTH	OCCURRENCE	DEPTH	OCCURRENCE	DEPTH	OCCURRENCE	DEPTH	OCCURRENCE	DEPTH	OCCURRENCE
101	MCP	95	1	1	54	53	43	43	3	3	0	0
1	CCP	1	0	0	0	0	1	100	0	0	0	0
2	STP	2	0	0	1	50	1	50	0	0	0	0
1	LSL	1	0	0	0	0	1	100	0	0	0	0
1	LSR	1	0	0	0	0	1	100	0	0	0	0

TOTAL

UNITS

106



NORTH FORK JACKASS CREEK

Drainage: JACKASS CREEK

Table 5 SUMMARY OF MEAN PERCENT COVER BY HABITAT TYPE

Survey Dates: 06/16/99 to 07/08/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR18WS1 LATITUDE:39°53'6" LONGITUDE:123°54'38"

UNITS MEASURED	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
68	8	LGR	22	17	19	12	17	0	14	0	0
6	2	HGR	14	5	25	20	15	0	4	10	7
6	1	GLD	70	0	0	30	0	0	0	0	0
14	1	RUN	25	15	0	20	40	0	0	0	0
21	4	SRN	5	14	15	15	13	0	9	30	0
101	11	MCP	20	23	26	9	3	0	3	9	6
1	1	CCP	60	0	0	40	0	0	0	0	0
2	1	STP	15	15	50	10	0	0	5	5	0
1	1	LSL	30	15	40	10	0	0	5	0	0
1	1	LSR	25	25	25	25	0	0	0	0	0

NORTH FORK JACKASS CREEK

Drainage: JACKASS CREEK

Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE

Survey Dates: 06/16/99 to 07/08/99

Confluence Location: QUAD: BEARHARBOR LEGAL DESCRIPTION: T23NR18WS1 LATITUDE:39°53'6" LONGITUDE:123°54'38"

TOTAL HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	% TOTAL SILT/CLAY DOMINANT	% TOTAL SAND DOMINANT	% TOTAL GRAVEL DOMINANT	% TOTAL SM COBBLE DOMINANT	% TOTAL LG COBBLE DOMINANT	% TOTAL BOULDER DOMINANT	% TOTAL BEDROCK DOMINANT
68	8	LGR	0	0	100	0	0	0	0
6	2	HGR	0	0	100	0	0	0	0
6	1	GLD	0	0	100	0	0	0	0
14	1	RUN	0	0	100	0	0	0	0
21	4	SRN	0	0	50	0	50	0	0
101	11	MCP	0	9	82	0	9	0	0
1	1	CCP	0	0	100	0	0	0	0
2	1	STP	0	0	100	0	0	0	0
1	1	LSL	0	0	100	0	0	0	0
1	1	LSR	0	0	100	0	0	0	0

**TABLE 7****NORTH FORK JACKASS CREEK**

Summary of Mean Percent Vegetative Cover for Entire Stream

Mean Percent Canopy	Mean Percent Conifer	Mean Percent Deciduous	Mean Percent Open Units	Mean Right Bank Percent Cover	Mean Left Bank Percent Cover
92	39	61	1	94	97

Note: Mean percent conifer and deciduous 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: NORTH FORK JACKASS CREEK

SAMPLE DATES: 06/16/99 to 07/08/99

STREAM LENGTH: 10214 ft.

LOCATION OF STREAM MOUTH:

USGS Quad Map: BEARHARBOR

Latitude: 39°53'6"

Legal Description: T23NR18WS1

Longitude: 123°54'

## SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

### STREAM REACH 01

Channel Type: B4

Canopy Density: 92%

Channel Length: 10214 ft.

Coniferous Component: 39%

Riffle/flatwater Mean Width: 9 ft.

Deciduous Component: 61%

Total Pool Mean Depth: 1.0 ft.

Pools by Stream Length: 32%

Base Flow: 0.0 cfs

Pools >=3 ft.deep: 3%

Water: 054- 057°F Air: 055-065°F

Mean Pool Shelter Rtn: 84

Dom. Bank Veg.: Deciduous Trees

Dom. Shelter: Undercut Banks

Vegetative Cover: 95%

Occurrence of LOD: 21%

Dom. Bank Substrate: Silt/Clay/Sand

Dry Channel: 0 ft.

Embeddness Value: 1. 11% 2.55% 3 20% 4 0% 5

**TABLE 9****NORTH FORK JACKASS CREEK****Mean Percentage of Dominant Substrate**

Dominant Class of Substrate	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Bedrock	3	0	4.84
Boulder	0	2	3.23
Cobble/Gravel	15	13	45.16
Silt/clay	13	16	46.77

**Mean Percentage of Dominant Vegetation**

Dominant Class of Vegetation	Number Units Right Bank	Number Units Left Bank	Total Mean Percent
Grass	0	0	0
Brush	5	2	11.29
Decid. Trees	16	18	54.84
Conif. Trees	10	11	33.87
No Vegetation	0	0	0

Total stream average embeddedness value for pool 2.51

TABLE 10. MEAN PERCENT OF SHELTER COVER TYPES FOR ENTIRE STREAM

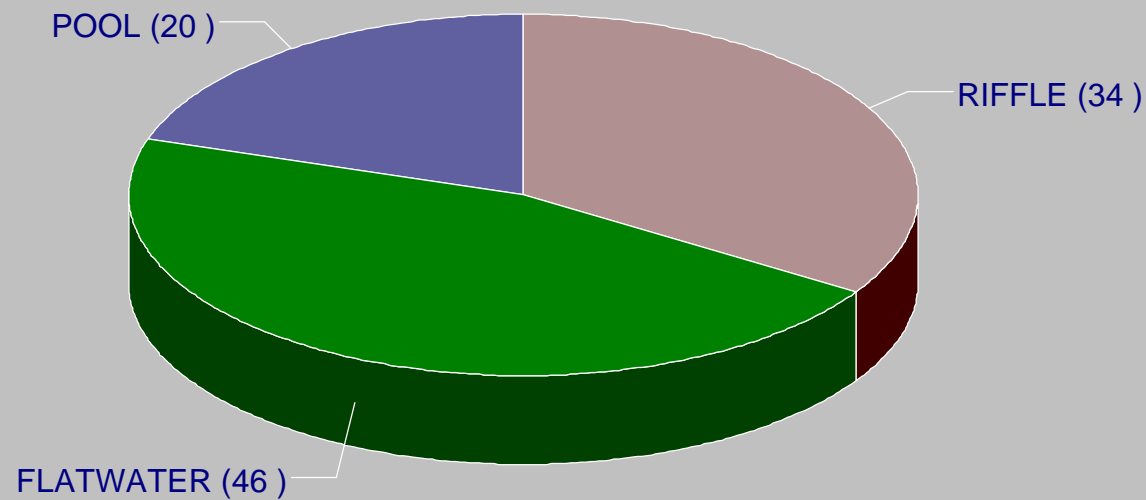
Stream: NORTH FORK JACKASS CDrainage: JACKASS CREEK

Survey Date: 06/16/99 to 07/08/99

	RIFFLES	FLATWATER	POOLS
UNDERCUT BANKS	21.71	19.17	23.67
SMALL WOODY DEBRIS	16.94	11.67	20.67
LARGE WOODY DEBRIS	21.45	10	27
ROOTS	13.87	18.33	12.33
TERRESTRIAL VEG	9.19	15	2
AQUATIC VEG	0	0	0
WHITEWATER	6.39	5.83	3
BOULDERS	7.90	20	7
BEDROCK LEDGES	2.55	0	4.33

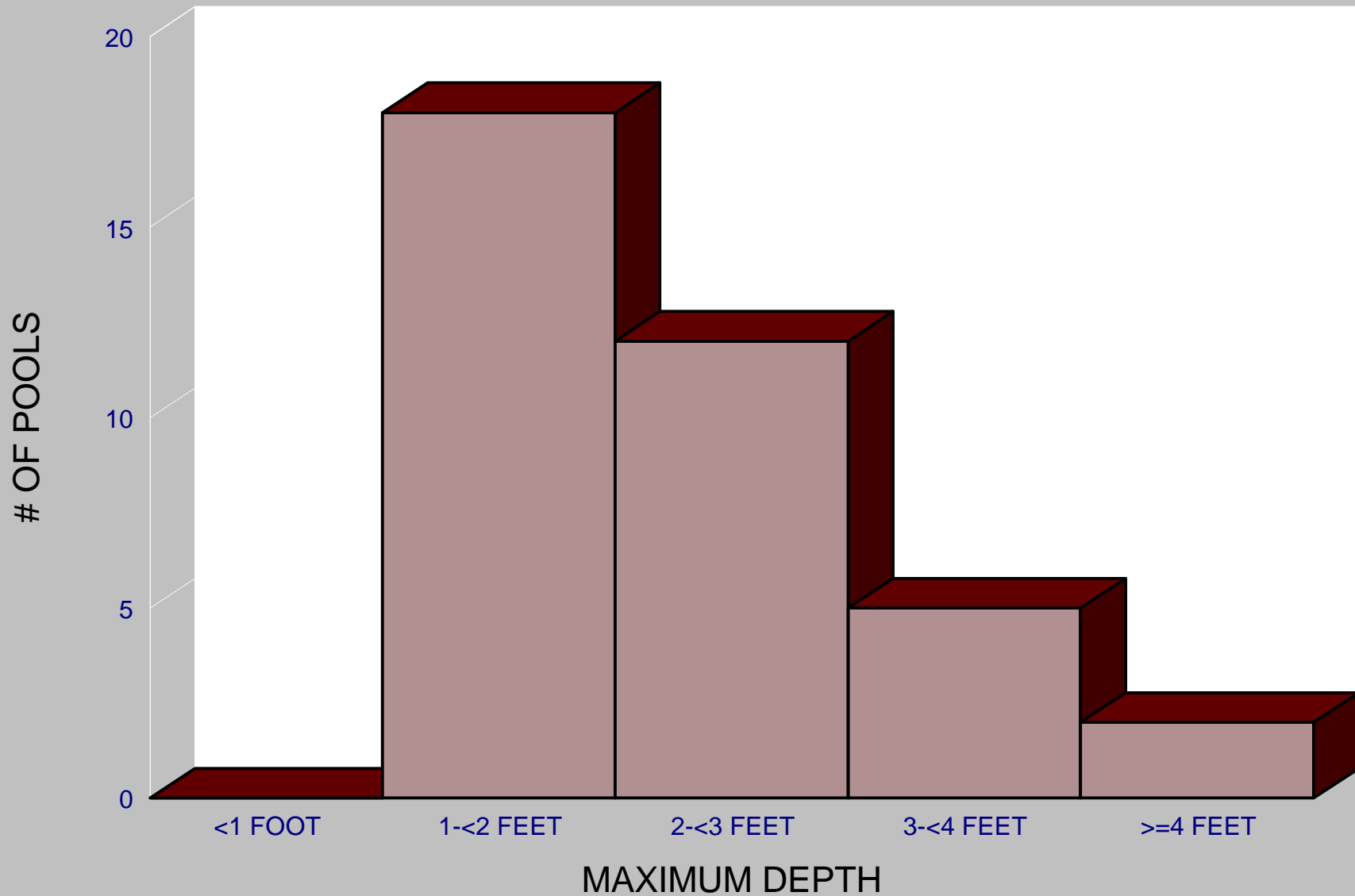
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# HABITAT TYPES BY PERCENT TOTAL LENGTH



GRAPH 2  
MAINSTEM JACKASS CREEK

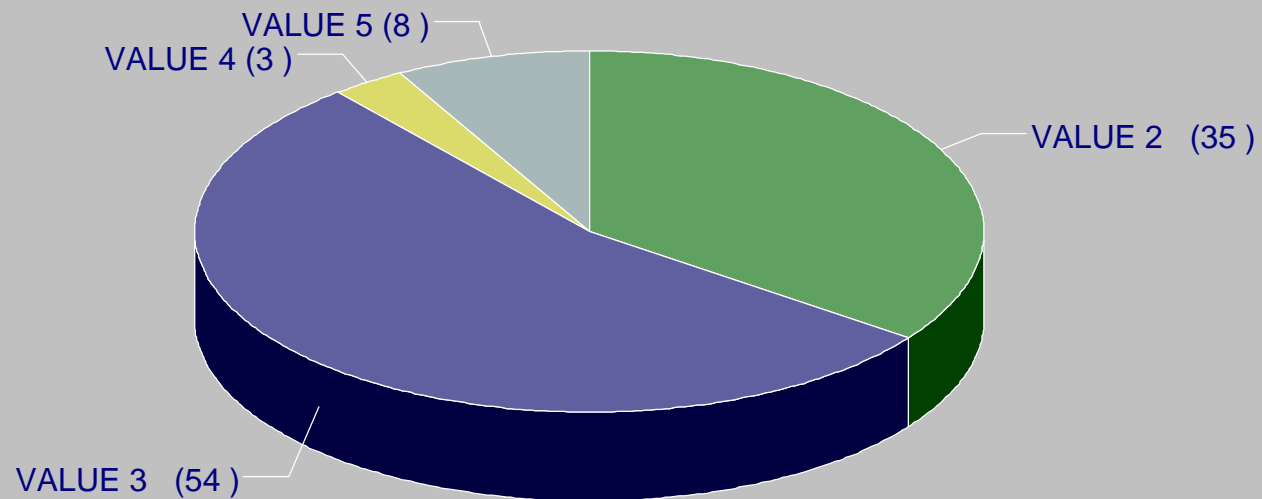
# MAXIMUM POOL DEPTHS



GRAPH 5  
MAINSTEM JACKASS CREEK

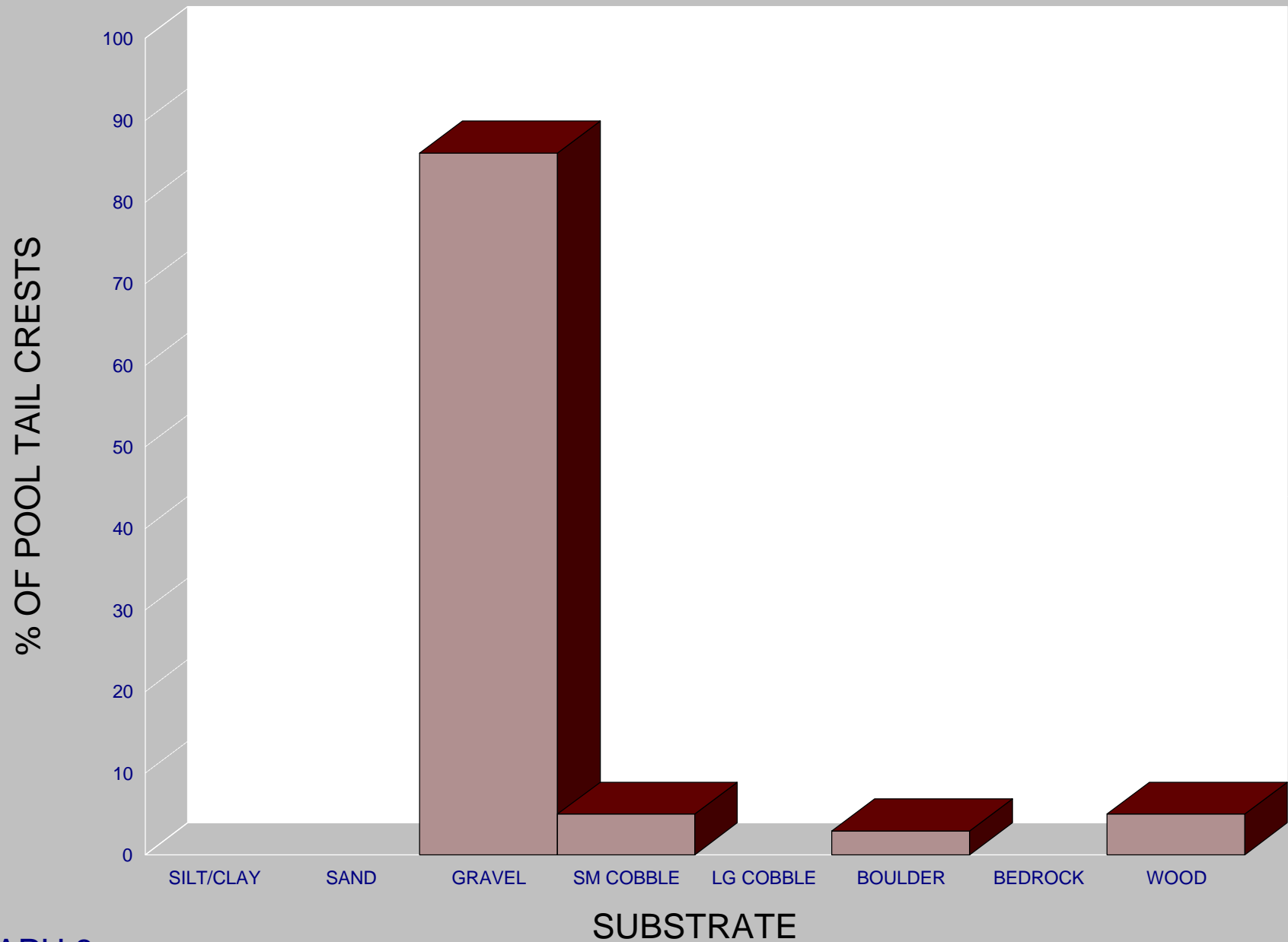


# PERCENT EMBEDDEDNESS



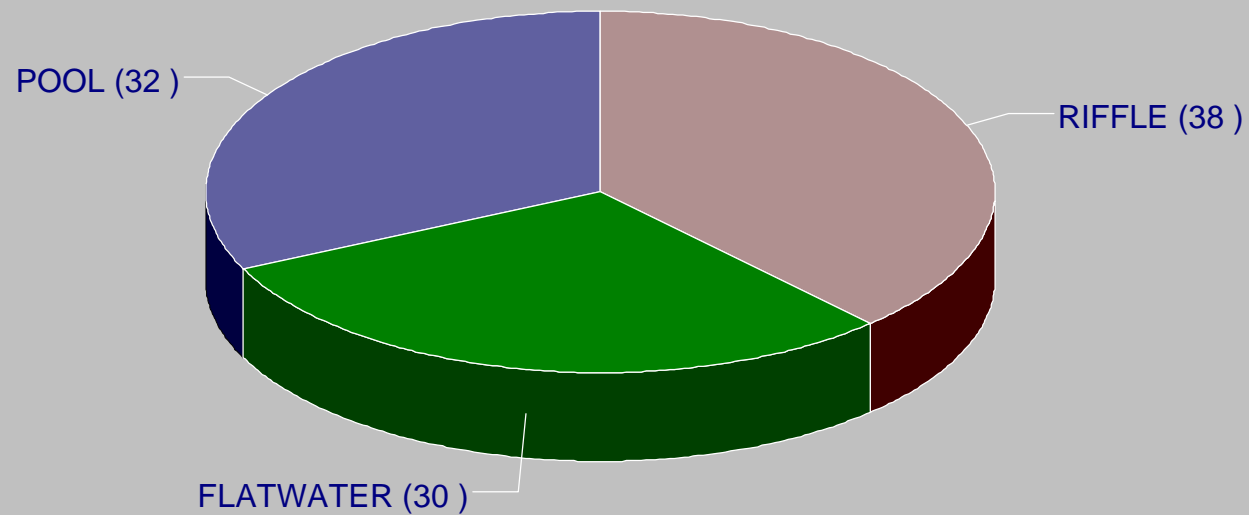
GRAPH 6  
MAINSTEM JACKASS CREEK

# SUBSTRATE COMPOSITION IN POOL TAIL CRESTS



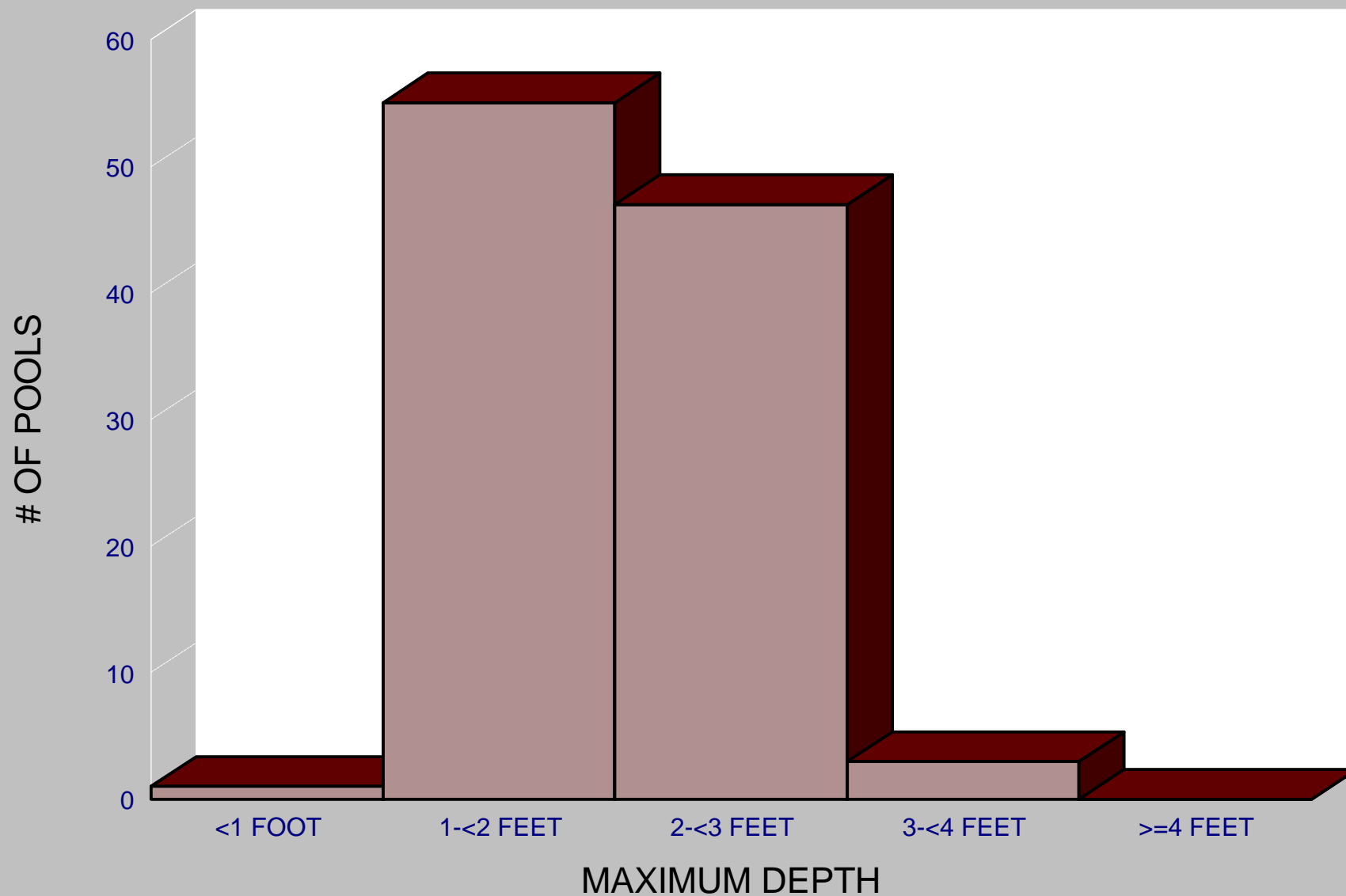
GRAPH 8  
MAINSTEM JACKASS CREEK

# HABITAT TYPES BY PERCENT TOTAL LENGTH



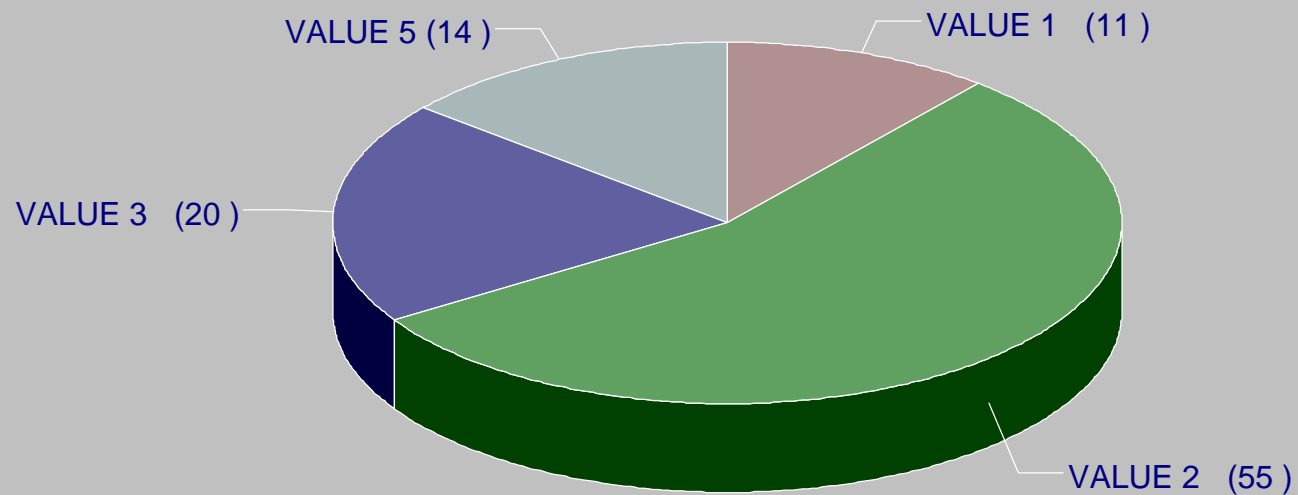
GRAPH 2  
NORTH FORK JACKASS CREEK

# MAXIMUM POOL DEPTHS



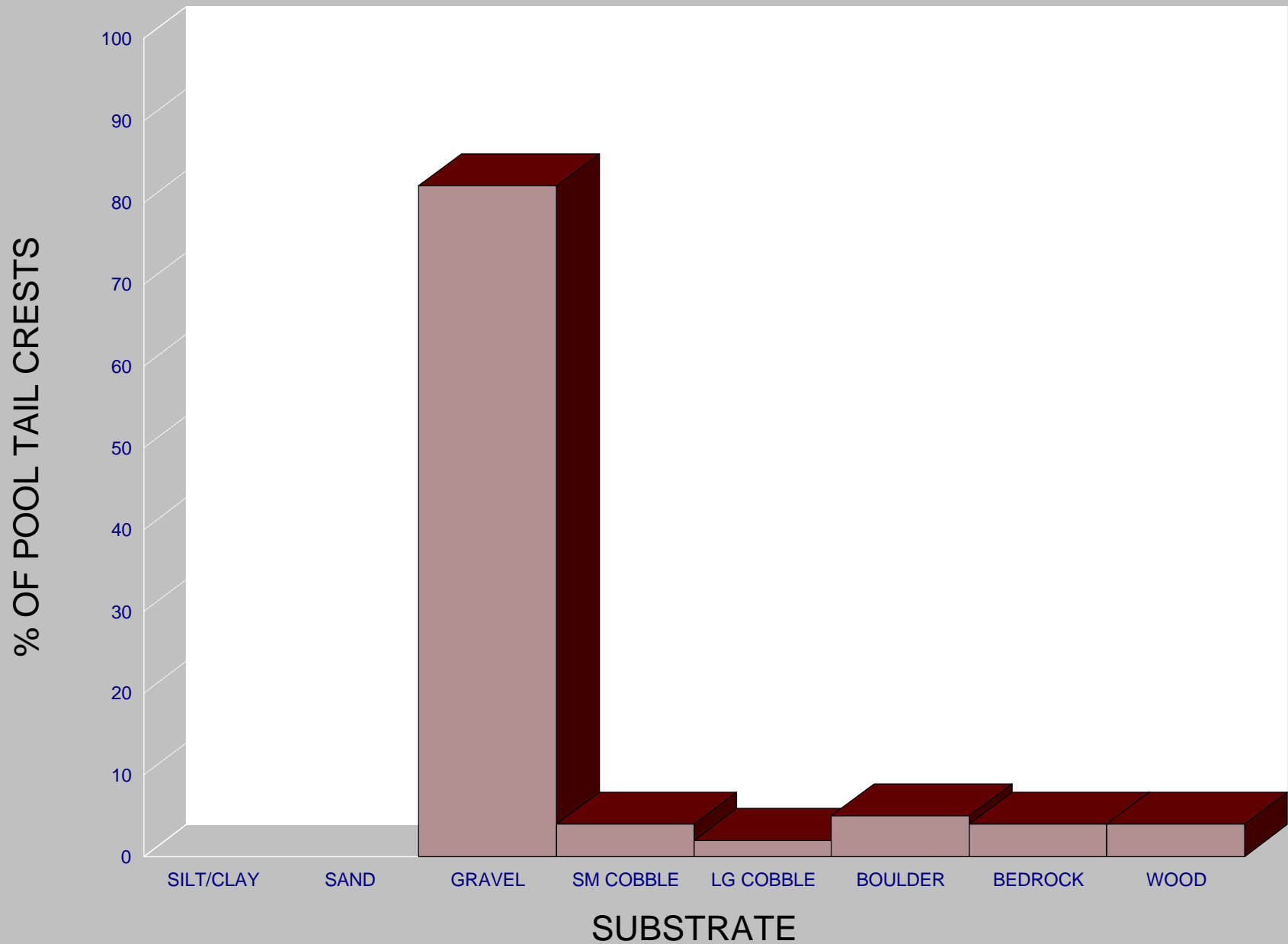
GRAPH 5  
NORTH FORK JACKASS CREEK

# PERCENT EMBEDDEDNESS



GRAPH 6  
NORTH FORK JACKASS CREEK

# SUBSTRATE COMPOSITION IN POOL TAIL CRESTS



GRAPH 8  
NORTH FORK JACKASS CREEK