

## **SECTION F FISH HABITAT CONDITION AND AQUATIC SPECIES DISTRIBUTION**

### **INTRODUCTION**

The fish species currently inhabiting the Gualala River WAU are steelhead trout (*Oncorhynchus mykiss*), sculpin (*Cottus spp.*), threespine stickleback (*Gasterosteus aculeatus*), California roach (*Lavinia symmetricus*), and Pacific lamprey (*Lampetra tridentata*). In 1973, the spawning population of coho in the Gualala River watershed was estimated at 4,000 fish (Bureau of Reclamation, 1973). Hatchery fish have been planted extensively in the basin; however it appears that coho are not currently present in watercourses within the MRC lands in the watershed. In 2002, coho young of the year were observed in the North Fork sub-basin (CDFG 2002).

A fish habitat assessment was conducted in the Gualala WAU to identify the current habitat conditions and areas of special concern regarding the three life stages of salmonids: spawning, summer rearing, and overwintering. Field surveys were conducted to evaluate the quality and quantity of salmonid habitat in the Gualala WAU. The fish habitat assessment evaluated the quality of spawning, rearing and overwintering habitats. The habitat data are combined into indices of habitat quality for the different life history stages.

Aquatic species distribution surveys were conducted by the previous landowners (Louisiana-Pacific Corp.) from 1994-1996, and were repeated by MRC from 2000-2002 (MRC 2002). The study consisted of single pass electro-fishing or snorkeling surveys in the summer months to assess aquatic species distribution and composition in the Gualala River WAU. All organisms observed were identified to the lowest possible taxonomic level.

### **METHODS**

#### **Salmonid Habitat Assessment**

The habitat inventory used to evaluate the habitat condition of the Gualala WAU was conducted during low flow conditions using methods modified from the California Salmonid Stream Restoration Manual (Flosi et al., 1998). Stream segments were created based on stream gradient and channel confinement (see Section E Stream Channel Condition module). Fish habitat conditions were determined by sampling representative stream segments throughout the watershed. Factors that determined fish habitat assessment locations included fish presence, accessibility and stream channel type (response, transport or source reach). Since high gradient streams were likely to be non-fish bearing, survey efforts were concentrated on low gradient reaches of the stream network.

A distance of 20-30 bankfull widths determined the survey length, representing approximately two meander bends of the stream channel, were observed. Data collected during the fish habitat and stream channel surveys provided information on pool, riffle and flatwater frequency; pool

spacing; spawning gravel quantity and quality; overwintering substrate; shelter complexity and large woody debris (LWD) frequency, condition and future recruitment.

The fish habitat observations were evaluated for quality for each salmonid life stage: spawning, summer rearing and overwintering. Table F-1 displays the targets used for rating measured habitat parameters. These indices are based on scientific literature (Bilby and Ward, 1989; Bisson et al., 1987; CDFG 1998; Montgomery et al., 1995; Washington Forest Practices Board, 1995) and professional judgment. Spawning habitat conditions are evaluated on the basis of gravel availability and quality (gravel sizes, subsurface fines, embeddedness), and are evaluated for preferred salmonid spawning areas located at the tail-outs of pools. Summer rearing habitat conditions for salmonids are evaluated on the size, depth and availability of pools and the complexity and quantity of cover (particularly large woody debris). Overwintering habitat is evaluated on the size, depth and availability of pools, the proportion of habitat units with cobble or boulder-dominated substrate (overwintering substrate) and the quantity of cover.

The habitat data are combined into indices of habitat quality for the different salmonid life stages. Measured fish habitat parameters were weighted and given a numeric scale to develop a quality rating for individual life history stages. Parameters were divided into subsets that correspond with individual life history stages (spawning, summer rearing, and overwintering habitat). Parameters were scored as follows: 1 (poor), 2 (fair), and 3 (good). Parameter weights were applied to the total score calculated as shown below. The parameter codes (see Table F-1) are in bold and the weights in parentheses.

#### Spawning Habitat

$$\mathbf{E} (0.25) + \mathbf{F} (0.25) + \mathbf{G} (0.25) + \mathbf{H} (0.25)$$

#### Summer Rearing Habitat

$$\mathbf{A} (0.20) + \mathbf{B} (0.15) + \mathbf{C} (0.15) + \mathbf{D} (0.15) + \mathbf{F} (0.15) + \mathbf{I} (0.20)$$

#### Overwintering Habitat

$$\mathbf{A} (0.20) + \mathbf{B} (0.15) + \mathbf{C} (0.15) + \mathbf{D} (0.10) + \mathbf{I} (0.20) + \mathbf{J} (0.20)$$

The overall score is rated as follows:

1.00 - 1.66 = Poor

1.67 - 2.33 = Fair

2.34 - 3.00 = Good

TableF-1. Fish Habitat Condition Indices for Measured Parameters.

| Fish Habitat Parameter   | Feature                        | Fish Habitat Quality                                  |   |   |
|--|--------------------------------|---|---|---|
|  |                                | Poor  | Fair  | Good  |
| Percent Pool<br>(By length)<br>(A)                                 | Anadromous<br>Salmonid Streams | <25%  | 25-50%  | >50%  |
| Pool Spacing<br>(Reach length/Bankfull/#pools)<br>(B)              | Anadromous<br>Salmonid Streams | ≥ 6.0   | 3.0 - 5.9   | ≤ 2.9   |
| Shelter Rating<br>(Shelter value x<br>% of habitat covered)<br>(C) | Pools                          | <60   | 60-120  | >120  |
| % Of Pools that are<br>≥3 ft. residual depth<br>(D)                | Pools                          | <25%  | 25-50%  | >50%  |
| Spawning Gravel Quantity<br>(% of Surface Area)<br>(E)             | Pool Tail-outs                 | <1.5%   | 1.5-3%  | >3%   |
| Percent<br>Embeddedness<br>(F)                                     | Pool Tail-outs                 | >50%  | 25-50%  | <25%  |
| Subsurface Fines<br>(L-P watershed analysis manual)<br>(G)         | Pool Tail-outs                 | 2.31-3.0  | 1.61-2.3  | 1.0-1.6   |
| Gravel Quality<br>Rating<br>(L-P watershed analysis manual)<br>(H) | Pool Tail-outs                 | 2.31-3.0  | 1.61-2.3  | 1.0-1.6   |
| Key LWD<br>+root wads / 328 ft<br>of stream.<br>(I)                | Streams < 40 ft. BFW           | <4.0  | 4.0-6.5   | >6.6  |
|  | Streams ≥ 40 ft. BFW           | <3.0  | 3.0-3.8   | >3.9  |
| Substrate for<br>Over-wintering<br>(J)                             | All Habitat<br>Types           | <20% of<br>Units<br>Cobble or<br>Boulder<br>Dominated | 20-40% of<br>Units<br>Cobble or<br>Boulder<br>Dominated | >40% of<br>Units<br>Cobble or<br>Boulder<br>Dominated |

### Aquatic Species Distribution

A hierarchical framework was used to select the initial locations of survey sites in each stream. Major streams were broken into lower, middle and upper reaches. Smaller streams were divided into lower and upper reaches. One site is surveyed in each reach, resulting in 3 sites in larger streams, and 2 sites in smaller streams. Additional sites are added directly downstream and upstream of potential migration barriers to determine which salmonid species these barriers are impacting.

A survey site contains a minimum of two consecutive habitat sequences (pool-riffle sequences) and has a minimum length of ninety feet. The survey method used to determine the aquatic species present is single pass electro-fishing or snorkeling. The effort put forth at each survey site is not sufficient to delineate the absence of a species.

Prior to initiating surveys water quality is measured using a Horiba™ U-10 Water Quality Checker. Measurements taken are water temperature (°C), conductivity (microS/cc), dissolved oxygen (mg/L), and pH. Air temperature is measured with a pocket thermometer and water visibility is estimated. Stream discharge is estimated or measured with a Swiffer™ Model 2100 flow meter. The actual physical parameters measured at each site vary depending on equipment availability. Horiba™ U-10 Water Quality Checkers were not used prior to the surveys in 2000.

The primary survey method is electro-fishing using a Smith-Root™ Model 12 (Smith-Root Inc., Vancouver, WA) backpack electro-fisher. One person operates the backpack electro-fisher while one or two other individuals use dip nets to capture the stunned species. The captured specimens are placed into a five-gallon bucket containing stream water. The aquatic species are enumerated, measured to fork length (fish) or snout-vent length (amphibians) and released back into the units from which they were captured. All vertebrate species are identified to the lowest possible taxonomic level.

Diving (snorkeling) is used to assess species presence when stream conditions are considered adequate or when elevated stream temperatures have the potential to adversely impact the health of the animals being electrofished. The basic survey unit for diving consists of a minimum of two pools, however if riffles are deep enough to allow underwater observation these units are sampled. Depending on the channel width, one to four divers are used for the field surveys. The diver(s) enters the survey unit from the downstream end and waits approximately one-minute before proceeding upstream to observe species. If the water velocity is too fast for divers to proceed upstream, the unit is surveyed by floating downstream. Dive slates are used to record data underwater. During the survey, salmonid species are enumerated by size class according to pre-determined size class categories (<70mm, 70–130mm, >130mm). All other vertebrate species observed during the field surveys are identified to the lowest possible taxonomic level.

## RESULTS

Tables F-2 and F-3 summarize the 2000 fish habitat assessment. A total of 10 segments, ranging between 0% and 7% slope were evaluated. The habitat parameters used to evaluate individual stream segments can be found in Table F-2. Each parameter has two values reported: score and rating. The 'score' is the value assigned to the habitat characteristic from the field observations. The 'rating' is the corresponding quality value for calculation of weighted habitat indices (see Table F-1). The ratings were used to calculate indices of habitat quality for each life history stage. A summary of the habitat ratings corresponding to each life history stage can be found in Table F-3. Data from six years of aquatic species distribution surveys (MRC 2002) are located in Appendix 1. Physical data collected during these distribution surveys is omitted from this report but may be obtained from MRC. Map F-1<sup>1</sup> illustrates the distribution of steelhead trout, in the Gualala River WAU.

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<sup>1</sup> Only one sheet of Map F-1 is presented, as compared to 2 sheets in other sections, because there is no fish distribution in the Doty and Robinson Creeks areas so the map was not included.

Table F-2. Summary of Fish Habitat Parameters, with Scores and Corresponding Ratings. Gualala River Watershed Analysis Unit, 2000.

| Segment | A. % Pool:Riffle: Flatwater by stream length |        | B. Pool Spacing |        | C. Shelter rating |        | D. % of all pools with residual depth $\geq$ 3 ft. |        | E. Spawning gravel quantity (%) |        | F.% Embeddedness |        | G. Sub-surface fines |        | H. Gravel Quality |        | I. Key LWD + rootwads / 328 ft. with Debris Jams |        | J. % Over-wintering substrate |        |
|---------|--|--------|-----------------|--------|-------------------|--------|--|--------|---------------------------------|--------|------------------|--------|----------------------|--------|-------------------|--------|--|--------|-------------------------------|--------|
|         | %  | Rating | Spacing         | Rating | Score             | Rating | %  | Rating | %                               | Rating | %                | Rating | Score                | Rating | Score             | Rating | Score  | Rating | %                             | Rating |
| ST10    | 71:29:0                                      | Good   | 3.0             | Fair   | 75                | Fair   | 0  | Poor   | 1.5-3                           | Fair   | >50              | Poor   | 2                    | Fair   | 2                 | Fair   | 18.7   | Good   | 47                            | Good   |
| ST11    | 72:28:0                                      | Good   | 3.7             | Fair   | 81                | Fair   | 0  | Poor   | 1.5-3                           | Fair   | >50              | Poor   | 2                    | Fair   | 2                 | Fair   | 2.50   | Poor   | 33                            | Fair   |
| ST19    | 45:55:0                                      | Fair   | 3.6             | Fair   | 92                | Fair   | 6  | Poor   | >3                              | Good   | >50              | Poor   | 2                    | Fair   | 2                 | Fair   | 16.7   | Good   | 59                            | Good   |
| SH1     | 82:18:0                                      | Good   | 1.9             | Good   | 35                | Poor   | 6  | Poor   | >3                              | Good   | 25-50            | Fair   | 2                    | Fair   | 2                 | Fair   | 4.1  | Good   | 12                            | Poor   |
| SR1     | 47:31:22                                     | Fair   | 2.7             | Good   | 74                | Fair   | 21   | Poor   | >3                              | Good   | 25-50            | Fair   | 2                    | Fair   | 2                 | Fair   | 0.3  | Poor   | 85                            | Good   |
| SR3     | 56:32:12                                     | Good   | 4.3             | Fair   | 70                | Fair   | 13   | Poor   | >3                              | Good   | >50              | Poor   | 2                    | Fair   | 2                 | Fair   | 3.4  | Fair   | 38                            | Fair   |
| SR11    | 69:31:0                                      | Good   | 4.7             | Fair   | 90                | Good   | 14   | Poor   | 1.5-3                           | Fair   | >50              | Poor   | 2                    | Fair   | 2                 | Fair   | 1.5  | Poor   | 29                            | Fair   |
| SA1     | 60:32:8                                      | Good   | 2.3             | Good   | 61                | Fair   | 50   | Good   | >3                              | Good   | >50              | Poor   | 2                    | Fair   | 2                 | Fair   | 0.5  | Poor   | 21                            | Fair   |
| SA13    | 32:58:10                                     | Fair   | 3.1             | Fair   | 67                | Fair   | 0  | Poor   | >3                              | Good   | >50              | Poor   | 2                    | Fair   | 2                 | Fair   | 1.7  | Poor   | 0                             | Poor   |
| SA19    | 56:36:8                                      | Good   | 2.8             | Good   | 47                | Poor   | 0  | Poor   | 1.5-3                           | Fair   | >50              | Poor   | 1                    | Poor   | 2                 | Fair   | 14.4   | Good   | 15                            | Poor   |

**Table F-3.** Summary of Fish Habitat Ratings for Three Life History Stages.  
Gualala River WAU, 2000.

| Segment | Slope gradient class (percent) | Spawning habitat score | Spawning habitat rating | Rearing habitat score | Rearing habitat rating | Over-wintering habitat score | Over-wintering habitat rating |
|---------|--------------------------------|------------------------|-------------------------|-----------------------|------------------------|------------------------------|-------------------------------|
| ST10    | 3-7                            | 1.75                   | Fair                    | 2.10                  | Fair                   | 2.50                         | Good                          |
| ST11    | 3-7                            | 1.75                   | Fair                    | 1.70                  | Fair                   | 1.90                         | Fair                          |
| ST19    | 3-7                            | 2.00                   | Fair                    | 1.90                  | Fair                   | 2.30                         | Fair                          |
| SH1     | 0-3                            | 2.25                   | Fair                    | 2.25                  | Fair                   | 2.10                         | Fair                          |
| SR1     | 0-3                            | 2.00                   | Fair                    | 1.80                  | Fair                   | 2.05                         | Fair                          |
| SR3     | 0-3                            | 2.00                   | Fair                    | 1.70                  | Fair                   | 1.90                         | Fair                          |
| SR11    | 3-7                            | 1.75                   | Fair                    | 1.85                  | Fair                   | 2.05                         | Fair                          |
| SA1     | 0-3                            | 2.00                   | Fair                    | 2.15                  | Fair                   | 2.25                         | Fair                          |
| SA13    | 3-7                            | 2.00                   | Fair                    | 1.45                  | Poor                   | 1.45                         | Poor                          |
| SA19    | 3-7                            | 1.50                   | Poor                    | 2.10                  | Fair                   | 2.10                         | Fair                          |

The Gualala WAU is comprised of four planning watersheds, all of which were surveyed for fish habitat. The discussion of results is separated into the four planning watersheds of the Gualala WAU. Each planning watershed contained 1 to 3 segments.

#### *Annapolis*

The segments surveyed (SA1, SA13 and SA19) in the Annapolis planning watershed had slopes ranging from 0-7%. Steelhead were present throughout the segments. Segments SA1 and SA13 were rated 'Fair' for spawning habitat due to highly embedded spawning gravels. Segment SA19 rated 'Poor' for spawning habitat due to highly embedded substrates and high levels of fine sediment. Summer rearing habitat was rated 'Fair' for segments SA1 and SA19. Segment SA1 had abundant pool habitat and deep pools, but had low levels of large woody debris which prevented a 'Good' rating. SA19 had abundant pool habitat and high levels of large woody debris, but had shallow pools and low levels of instream cover. Segment SA13 was rated 'Poor' for rearing habitat since it had shallow pools and low levels of large woody debris. Overwintering habitat was also rated 'Poor' for SA13, due to low levels of larger substrates that provide shelter to young fish during higher wintertime flows. Overwintering habitat was rated 'Fair' in segments SA1 and SA19 due to poor to fair amounts of overwintering substrate. All of the segments within this planning watershed had highly embedded substrates.

#### *Flat Ridge Creek*

The segments surveyed (SR1, SR3 and SR11) in the Flat Ridge Creek planning watershed had slope gradients of 0-7%. Steelhead were present throughout these segments. Spawning habitat was rated 'Fair' for all the segments due to fair to good quantities of spawning gravels, but also had fair to high levels of embedded substrates. Summer rearing habitat was rated 'Fair' for all segments due to fair to good quantities of pool habitat and instream cover, but also had shallow pools and poor to fair levels of large woody debris. Overwintering habitat was rated 'Fair' for all segments due to fair to good quantities of overwintering substrate, 'Good' ratings were not achieved due to shallow pools and low levels of large woody debris. The segments surveyed within this planning watershed had poor pool depths and fairly low levels of large woody debris.

*Haupt Creek*

The only segment surveyed (SH1) in the Haupt Creek planning watershed had slope gradients of 0-3%. Steelhead were present throughout this segment. Spawning habitat was rated 'Fair' and consisted of abundant spawning gravels, moderate levels of substrate embeddedness and fair amounts of fine sediment. Summer rearing habitat was rated 'Fair' due to abundant pool habitat and good levels of large woody debris but the segment also had shallow pools and low quantities of instream cover. Overwintering habitat was rated 'Fair' due to poor levels of overwintering substrate.

*Tobacco Creek*

The segments surveyed (ST10, ST11 and ST19) in the Tobacco Creek planning watershed had slope gradients of 0-7%. Steelhead were present in all segments except for the upper Crocker Creek segment (ST11). Spawning habitat was rated 'Fair' for all segments due to fair to good quantities of spawning gravels but the substrates were highly embedded. Summer rearing habitat was rated 'Fair' for all segments and consisted of abundant pools and good levels of large woody debris, but poor pool depths and highly embedded substrate prevent these segments from achieving 'Good' ratings. Overwintering habitat was rated 'Fair' for segments ST11 and ST19 due to fair to good quantities of overwintering substrate available to young fish for shelter during higher wintertime flows, 'Good' ratings were not achieved due to poor pool depths. Segment ST10 received 'Good' overwintering habitat ratings due to good quantities of overwintering substrate and high levels of large woody debris. The segments within this planning watershed contained good levels of large woody debris, but had shallow pools and highly embedded substrates.

**Aquatic Species Distribution**

Data from six years of fish distribution surveys are located in the appendix. Map F-1 illustrates the distribution of steelhead trout and other non-salmonid fish species (California roach, sculpin, and stickleback) in the Gualala WAU.

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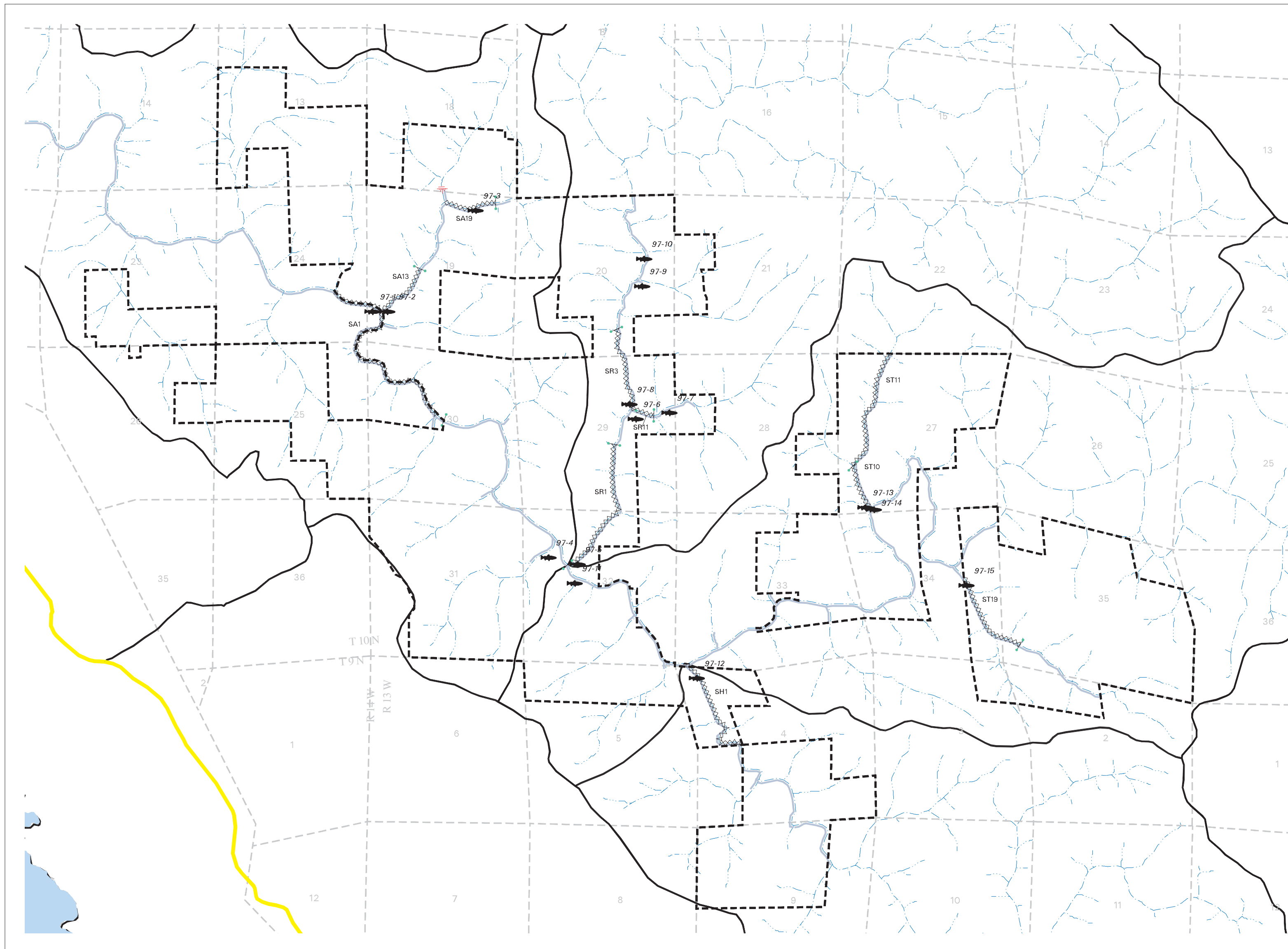
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**Gualala River  
Watershed Analysis  
Unit**

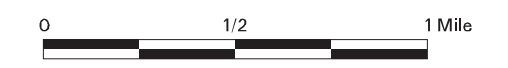
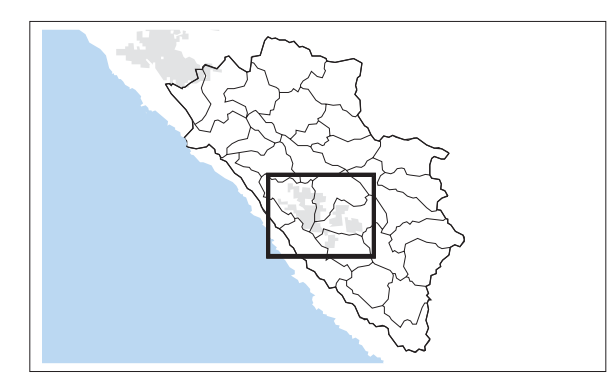
**Map F-1  
Salmonid Distribution**

This map illustrates the distribution of steelhead trout and other non-salmonid fish species (California roach, sculpin, stickleback, and pacific lamprey) in the Gualala WAU. It is based on distribution surveys conducted by MRC in 2000-2002 and the previous landowner Louisiana-Pacific Corporation in 1994-1996. From the distribution surveys the presentation for the various fish species is extrapolated from field evaluation, fish survey data and results of Gualala fish habitat assessment.



- Potential Salmonid Distribution
- Steelhead Distribution
  - Fish Distribution Sampling Locations
- Barriers to Adult Salmonid Upstream Migration
- Gradient
  - Waterfall
  - MRC Ownership
  - Planning Watershed Boundary
  - Gualala River Watershed Boundary
- Flow Class
- Class I
  - Class II
  - Class III

Sheet 1



**Appendix F**

Appendix F. Summary of results for aquatic species surveys within the Gualala River watershed, Mendocino Co., California. Refer to Map F-1.

| STREAM NAME                      | SITE ID | DATE       | STH <70 MM | STH 70-130 MM | STH >130 MM | COH <70 MM | COH 70-130 MM | OTHER SPECIES |
|----------------------------------|---------|------------|------------|---------------|-------------|------------|---------------|---------------|
| WHEATFIELD FORK                  | 97-01   | 8/15/1995  | PRESENT    | PRESENT       | PRESENT     |            |               | RCH SCP STB   |
| WHEATFIELD FORK                  | 97-01   | 7/16/1996  | PRESENT    | PRESENT       | PRESENT     |            |               | RCH SCP       |
| WHEATFIELD FORK                  | 97-01   | 8/9/2000   |            | 2             | 1           |            |               | RCH SCP       |
| WHEATFIELD FORK                  | 97-01   | 8/6/2001   | 50         |               |             |            |               | CRY RCH       |
| WHEATFIELD FORK                  | 97-01   | 10/11/2002 |            |               |             |            |               | CRY RCH STB   |
| ANNAPOLIS FALLS CREEK            | 97-02   | 8/15/1995  | PRESENT    | PRESENT       |             |            |               | CRY PGS       |
| ANNAPOLIS FALLS CREEK            | 97-02   | 7/16/1996  | PRESENT    |               |             |            |               |               |
| ANNAPOLIS FALLS CREEK            | 97-02   | 8/9/2000   | 8          | 1             |             |            |               | CR YLF        |
| ANNAPOLIS FALLS CREEK            | 97-02   | 8/6/2001   | 9          |               |             |            |               |               |
| TRIB TO ANNAPOLIS FALLS CREEK #1 | 97-03   | 8/15/1995  | PRESENT    | PRESENT       | PRESENT     |            |               |               |
| TRIB TO ANNAPOLIS FALLS CREEK #1 | 97-03   | 7/16/1996  | PRESENT    |               |             |            |               | PGS           |
| TRIB TO ANNAPOLIS FALLS CREEK #1 | 97-03   | 8/9/2000   | 5          | 2             |             |            |               |               |
| TRIB TO ANNAPOLIS FALLS CREEK #1 | 97-03   | 8/6/2001   | 2          |               | 1           |            |               |               |
| TRIB TO WHEATFIELD FORK #1       | 97-04   | 8/14/1995  | PRESENT    |               |             |            |               | PGS RCH YLF   |
| TRIB TO WHEATFIELD FORK #1       | 97-04   | 7/16/1996  | PRESENT    |               |             |            |               | PGS           |

\* Species Abbreviations; AMM=Pacific Lamprey Larvae; BUFO=Western Toad; CR=Coast Range Sculpin; CRY=Crayfish; NWP=Western Pond Turtle; PGS=Pacific Giant Salamander; PR=Prickly Sculpin; RCH=California Roach; RSN=Rough Skinned Newt; SCP=Sculpin (Unidentified Species); STB=Stickleback; STH=Steelhead Trout; YLF=Yellow Legged Frog.

\* Numbers presented represent the number of individuals observed and are not population estimates. \*Blank spaces indicate that no organisms were observed.

Appendix F. Summary of results for aquatic species surveys within the Gualala River watershed, Mendocino Co., California. Refer to Map F-1.

| STREAM NAME                | SITE ID | DATE       | STH <70 MM | STH 70-130 MM | STH >130 MM | COH <70 MM | COH 70-130 MM | OTHER SPECIES   |
|----------------------------|---------|------------|------------|---------------|-------------|------------|---------------|-----------------|
| TRIB TO WHEATFIELD FORK #1 | 97-04   | 8/9/2000   | 2          |               |             |            |               | PGS             |
| TRIB TO WHEATFIELD FORK #1 | 97-04   | 8/8/2001   |            | 1             |             |            |               | RCH             |
| TRIB TO WHEATFIELD FORK #1 | 97-04   | 10/10/2002 | 1          |               |             |            |               | RCH             |
| FULLER CREEK               | 97-05   | 8/14/1995  | PRESENT    | PRESENT       | PRESENT     |            |               | RCH SCP STB YLF |
| FULLER CREEK               | 97-05   | 7/16/1996  | PRESENT    | PRESENT       | PRESENT     |            |               | RCH SCP         |
| FULLER CREEK               | 97-05   | 8/9/2000   | 5          | 1             |             |            |               | RCH SCP         |
| FULLER CREEK               | 97-05   | 8/8/2001   | 4          |               |             |            |               | CRY NWP RCH SCP |
| FULLER CREEK               | 97-05   | 10/10/2002 | 8          | 2             |             |            |               | RCH SCP         |
| SULLIVAN CREEK             | 97-06   | 8/14/1995  | PRESENT    | PRESENT       |             |            |               | YLF             |
| SULLIVAN CREEK             | 97-06   | 7/17/1996  | PRESENT    | PRESENT       | PRESENT     |            |               |                 |
| SULLIVAN CREEK             | 97-06   | 8/8/2000   | 5          | 4             |             |            |               | RCH SCP YLF     |
| SULLIVAN CREEK             | 97-06   | 8/8/2001   | 7          | 2             |             |            |               | RCH YLF         |
| SULLIVAN CREEK             | 97-07   | 7/17/1996  | PRESENT    | PRESENT       | PRESENT     |            |               | YLF             |
| SULLIVAN CREEK             | 97-07   | 8/8/2000   |            |               |             |            |               | PGS YLF         |
| SULLIVAN CREEK             | 97-07   | 8/8/2001   |            |               |             |            |               | PGS YLF         |

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| STREAM NAME             | SITE ID | DATE       | STH <70 MM | STH 70-130 MM | STH >130 MM | COH <70 MM | COH 70-130 MM | OTHER SPECIES   |
|-------------------------|---------|------------|------------|---------------|-------------|------------|---------------|-----------------|
| SULLIVAN CREEK          | 97-07   | 10/10/2002 | 7          | 2             |             |            |               |                 |
| FULLER CREEK            | 97-08   | 8/14/1995  | PRESENT    | PRESENT       |             |            |               | RCH STB         |
| FULLER CREEK            | 97-08   | 7/17/1996  | PRESENT    | PRESENT       | PRESENT     |            |               | RCH SCP STB YLF |
| FULLER CREEK            | 97-08   | 8/8/2000   | 6          | 2             |             |            |               | RCH STB         |
| FULLER CREEK            | 97-08   | 8/8/2001   | 10         | 4             |             |            |               | CR PR RCH       |
| FULLER CREEK            | 97-08   | 10/10/2002 | 11         | 1             |             |            |               | RCH             |
| TRIB TO FULLER CREEK #1 | 97-09   | 8/14/1995  | PRESENT    | PRESENT       |             |            |               | PGS             |
| TRIB TO FULLER CREEK #1 | 97-09   | 7/17/1996  | PRESENT    | PRESENT       | PRESENT     |            |               |                 |
| TRIB TO FULLER CREEK #1 | 97-09   | 8/8/2000   | 6          | 1             |             |            |               | PGS             |
| TRIB TO FULLER CREEK #1 | 97-09   | 8/6/2001   | 6          |               |             |            |               | PGS             |
| FULLER CREEK            | 97-10   | 8/14/1995  | PRESENT    | PRESENT       | PRESENT     |            |               | RCH STB         |
| FULLER CREEK            | 97-10   | 7/17/1996  | PRESENT    | PRESENT       |             |            |               | RCH SCP STB     |
| FULLER CREEK            | 97-10   | 8/8/2000   | 16         | 2             |             |            |               | RCH SCP STB YLF |
| FULLER CREEK            | 97-10   | 8/6/2001   | 11         |               |             |            |               | PR              |
| FULLER CREEK            | 97-10   | 10/11/2002 | 5          | 5             |             |            |               |                 |

\* Species Abbreviations; AMM=Pacific Lamprey Larvae; BUFO=Western Toad; CR=Coast Range Sculpin; CRY=Crayfish; NWP=Western Pond Turtle; PGS=Pacific Giant Salamander; PR=Prickly Sculpin; RCH=California Roach; RSN=Rough Skinned Newt; SCP=Sculpin (Unidentified Species); STB=Stickleback; STH=Steelhead Trout; YLF=Yellow Legged Frog.

\* Numbers presented represent the number of individuals observed and are not population estimates. \*Blank spaces indicate that no organisms were observed.

Appendix F. Summary of results for aquatic species surveys within the Gualala River watershed, Mendocino Co., California. Refer to Map F-1.

| STREAM NAME     | SITE ID | DATE       | STH <70 MM | STH 70-130 MM | STH >130 MM | COH <70 MM | COH 70-130 MM | OTHER SPECIES  |
|-----------------|---------|------------|------------|---------------|-------------|------------|---------------|----------------|
| WHEATFIELD FORK | 97-11   | 8/14/1995  | PRESENT    | PRESENT       | PRESENT     |            |               | RCH STB        |
| WHEATFIELD FORK | 97-11   | 7/16/1996  | PRESENT    | PRESENT       |             |            |               | RCH SCP        |
| WHEATFIELD FORK | 97-11   | 8/8/2000   | 1          | 2             |             |            |               | RCH STB        |
| WHEATFIELD FORK | 97-11   | 8/8/2001   |            |               |             |            |               | RCH            |
| WHEATFIELD FORK | 97-11   | 10/10/2002 | 19         | 6             |             |            |               | RCH STB YLF    |
| HAUPT CREEK     | 97-12   | 8/15/1995  | PRESENT    | PRESENT       |             |            |               | PGS RCH STB    |
| HAUPT CREEK     | 97-12   | 7/17/1996  | PRESENT    | PRESENT       | PRESENT     |            |               | RCH SCP STB    |
| HAUPT CREEK     | 97-12   | 7/6/2000   | 12         | 3             |             |            |               |                |
| HAUPT CREEK     | 97-12   | 8/6/2001   | 3          | 2             |             |            |               | PR RCH STB YLF |
| CROCKER CREEK   | 97-13   | 8/15/1995  |            |               |             |            |               | PGS YLF        |
| CROCKER CREEK   | 97-13   | 7/17/1996  | PRESENT    | PRESENT       |             |            |               |                |
| CROCKER CREEK   | 97-13   | 7/7/2000   | 11         | 2             |             |            |               | PGS YLF        |
| CROCKER CREEK   | 97-13   | 8/6/2001   |            |               |             |            |               | PGS YLF        |
| CROCKER CREEK   | 97-13   | 10/11/2002 |            | 1             |             |            |               | PGS YLF        |
| WHEATFIELD FORK | 97-14   | 8/15/1995  |            | PRESENT       |             |            |               | RCH STB        |

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\* Numbers presented represent the number of individuals observed and are not population estimates. \*Blank spaces indicate that no organisms were observed.

**Appendix F. Summary of results for aquatic species surveys within the Gualala River watershed, Mendocino Co., California. Refer to Map F-1.**

| <b>STREAM NAME</b> | <b>SITE ID</b> | <b>DATE</b> | <b>STH &lt;70 MM</b> | <b>STH 70-130 MM</b> | <b>STH &gt;130 MM</b> | <b>COH &lt;70 MM</b> | <b>COH 70-130 MM</b> | <b>OTHER SPECIES</b> |
|--------------------|----------------|-------------|----------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|
| WHEATFIELD FORK    | 97-14          | 7/17/1996   | PRESENT              |                      | PRESENT               |                      |                      | RCH STB              |
| WHEATFIELD FORK    | 97-14          | 7/7/2000    | 2                    |                      |                       |                      |                      | RCH STB              |
| WHEATFIELD FORK    | 97-14          | 8/6/2001    | 1                    |                      |                       |                      |                      | AMM RCH STB          |
| WHEATFIELD FORK    | 97-14          | 10/11/2002  |                      | 2                    |                       |                      |                      | RCH STB YLF<br>BUFO  |
| TOBACCO CREEK      | 97-15          | 8/15/1995   | PRESENT              | PRESENT              |                       |                      |                      | PGS                  |
| TOBACCO CREEK      | 97-15          | 7/17/1996   | PRESENT              |                      |                       |                      |                      | PGS RSN              |
| TOBACCO CREEK      | 97-15          | 8/8/2000    | 7                    | 3                    |                       |                      |                      | PGS                  |
| TOBACCO CREEK      | 97-15          | 8/6/2001    |                      | 7                    |                       |                      |                      | YLF                  |
| TOBACCO CREEK      | 97-15          | 10/11/2002  |                      |                      |                       |                      |                      | YLF                  |

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