May 14, 2001

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Hello,

This letter is to address the numerous reasons why Beith and Grotzman Creeks deserve to be listed as 303d, overly impacted waterbodies, by the EPA. Included is quantitative data as well as descriptive/qualitative information.

1) Turbidity monitoring data from Grotzman and Beith Creek
2) Information collected by the Sunny Brae Arcata Neighborhood Alliance regarding flooding and adverse conditions brought on by previous timber harvests in the area of Beith and Grotzman
3) Some thoughts of the scientific community on turbidity, fish populations and other ideas

Beith and Grotzman Creeks are part of the Eureka Plain Hydrological Unit, draining into Humboldt Bay. The various beneficial uses of water that are associated with these creeks are agriculture, industrial service supply, industrial process, navigational, spawning, reproduction, and/or early development, recreational, commercial and sport fishing, cold water fisheries, water contact recreation, non-contact water recreation, wildlife, migration of aquatic organisms, habitat for rare/threatened/endangered plants and animal life, marine, spawning, shellfish, estuary, aquaculture, municipal and domestic supply, and groundwater recharge.

These creeks harbor spawning rearing and overwintering populations of cutthroat, Coho, and Steelhead. The City of Arcata has already invested capital expenditures in recovering the beneficial uses of Grotzman Creek and Beith Creek, including strategic riparian acquisitions and the placement of staff plates for monitoring various reaches. With 303d listing, the City of Arcata's investments will not be wasted. Currently, the Sunny Brae Middle School is participating in monitoring the health of both creeks. Their efforts would be greatly improved with the protections granted by a 303d listing.

The Beith Creek watershed drains the southern slopes of Fickle Hill. The size of the watershed is approximately 1-2 square miles. The lower portion of the creek was

channelized sometime before 1941 and it now flows year round. Cutthroat trout and silver salmon were once abundant in the creek but their numbers are now limited. Beith Creek is impacted by suburban and urban development, as well as timber harvest, grazing, golf course run off and channelization have had a negative impact. It is representative of many of the small coastal streams affected by multiple use land management activities on the North Coast. These streams compromise a critical and vulnerable network fundamental to the genetic diversity of listed salmonid populations. The land use to which Beith and Grotzman (and other small streams) are subjected create a gauntlet effect for the salmonids which must traverse, spawn, rear, overwinter, and smolt in conditions which represent the entire spectrum of possible stream conditions.

Grotzman Creek consists of two forks, north and south. The main channel is a perennial first order stream.

According to Dr. Peter Moyle, fisheries professor at UCD, the principle cause of the decline in coastal salmonids is the deterioration of the coastal watersheds and he further specifies that logging and road building in these area have been major factors in the deterioration (Moyle 1993.) Sierra Pacific Industries (SPI) has filed THP 00-234 to harvest 171 acres in the Beith and Grotzman drainages. The plan is headed to CDF for 2nd review May 17.

Local wild populations of listed salmonids in Beith and Grotzman Creeks are critical to the re-population of native species in their respective ESUs. Genetic diversity, according to a National Research Council report on Pacific Northwest Salmonids (NRC, Upstream, Salmon and Society in the Pacific NW, pg. 7-8, 1996), underlies the success of the species. Genetic diversity depends upon the presence of healthy habitat throughout the range of the salmon so that local genetic variations are sustained.

"For the evolution and continued existence of species, genetic differences between populations are as important as genetic differences between individuals with in a population." (Ibid., page 148)

"Because of homing, the fundamental unit of replacement or recruitment for anadramous salmon is the local population" (Rich 1939, Ricker 1972), that is an adequate number of individual for each local reproductive population is needed to ensure persistence of the many reproductive units that make up a fished stock of salmon. The homing of salmon to their natal streams produces a branching system of local reproductive populations that are largely demographically and genetically isolated.' (ibid., page 149)

"One important reason to protect local populations is that they are locally adapted to the streams that support them. In other words, evolution has made a local breeding population better able to survive and reproduce in its home stream than in others. Re-establishing new populations through introduction once the local populations have been lost has proved to be extremely difficult." (ibid., page 150)

Turbidity measurements have been recorded during the previous 2 rain seasons. Data

from this most recent hydrologic year (2001) is included. Salmon Forever (SF), a non-profit organization which trains community members in turbidity monitoring, oversaw the local grab sampling program. Turbidity monitoring has been determined by the Regional Water Quality Control Board as the most cost effective and sensitive measure of land use on streams. This belief is also shared by the Pacific Lumber Company and is written in their Habitat Conservation Plan. Grotzman Creek recorded turbidity levels, NTUs, as high as 926.0 on April 6 of this year (Fenton data) According to Sigler, Bjorn and Everest, turbidity levels of 25 NTUs are damaging to salmonid populations ('84 Sigler et al.) Jeff Barrett, of the Pacific Lumber Company authored a paper entitled *Transaction of America's Fisheries* where he echoed Sigler et al findings that exposure to turbidity levels of 25 NTU or greater causes damage. Beith Creek has also experienced NTU levels of over 200 (Fenton data.)

In regards to flooding, I have included a history report complied by residents of the Sunny Brae neighborhood. Beith and Grotzman Creeks flow above and through the neighborhood. In response to SPI's desire to harvest in the area (see map) concerned community members began compiling information of the previous flooding events, from timber harvest and development. Their accounts have been included into the administrative record with CDF in regards to THP 00-234. In summary, the area floods when land management activities occur in the upper slopes of the region, SPI's cut will only worsen the situation and further damage the water quality of both Beith and Grotzman Creeks. 303d listing, while not occurring until 2002, will improve the situation for the residents of the Sunny Brae neighborhood as the current looming logging operation would be more protective of the landscape/watershed.

Some random thoughts: According to Higgins et al 1992, Humboldt Chapter of the American Fisheries Society page 6, states that in Humboldt Bay tributaries, Coho salmon are "species of concern" and fall trout are at "high risk." According to Brown, Noyo, and Yasitamo 1992, the ideal pool depth for salmonids is 1 meter or greater. With increased sedimentation, aggradation will occur, reducing the depth of pools that are so necessary for salmonid reproduction.

With all the damage done to the various waterbodies throughout the North Coast, the small creeks that remain in fairly good condition need help to remain that way. Sediment and sedimentation is the pollutant found in a majority of the region's streams. The number one cause of salmonid depletion is loss of habitat and that loss is due mainly to sediment destruction of spawning grounds and sediment choking/ blinding salmon. Freshwater Creek, Elk River, the Mattole River, reaches of the Eel River and many more are suffering from sedimentation. Given that small stream populations are the cornerstones of genetic diversity, it is imperative to grant the protection of 303d listing to both Beith and Grotzman Creeks.

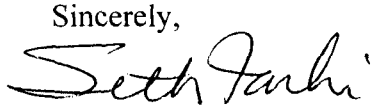
There are proposals to develop a hillside that drains into Beith Creek into residential homes. This extra 'humanization' will only lead to more damage to the watershed of Beith Creek as the disturbed soils and removal of canopy will hold less water, increasing the run-off.

Another area of concern is the golf course that is located on Buttermilk Lane. While I have no statistical data to include, the herbicides and pesticides which are used to "control" species are having a negative effect on the creeks. Given the fact that these chemicals are designed to kill, it is only logical that these substances, some the very harmful Persistent Organic Chemicals, are bioaccumulating in the various species that inhabit the creeks of Beith and Grotzman. Herbicide information is a very difficult thing to acquire and unfortunately time constraints prevented me from reviewing and summarizing the data. However the Department of Pesticide Regulation can be of help.

Overall, granting 303d listing to the creeks of Beith and Grotzman will protect the beneficial uses of water listed above. As the salmonid populations of the North Coast struggle to hold on, this listing can only help them in their recovery.

If I can be of any more assistance, please contact me at the phone and email listed above. As this is of critical importance to the survival of salmonid species, I will do what I can to help out

Sincerely,



Seth Farhi

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1996 NRC, Upstream, Salmon, and Society – Genetic importance

1984 Sigler, Bjorn, and Everest – Turbidity levels of 25 NTUs damaging

1994 Brown, Noyo, and Yastiamo – pool depth

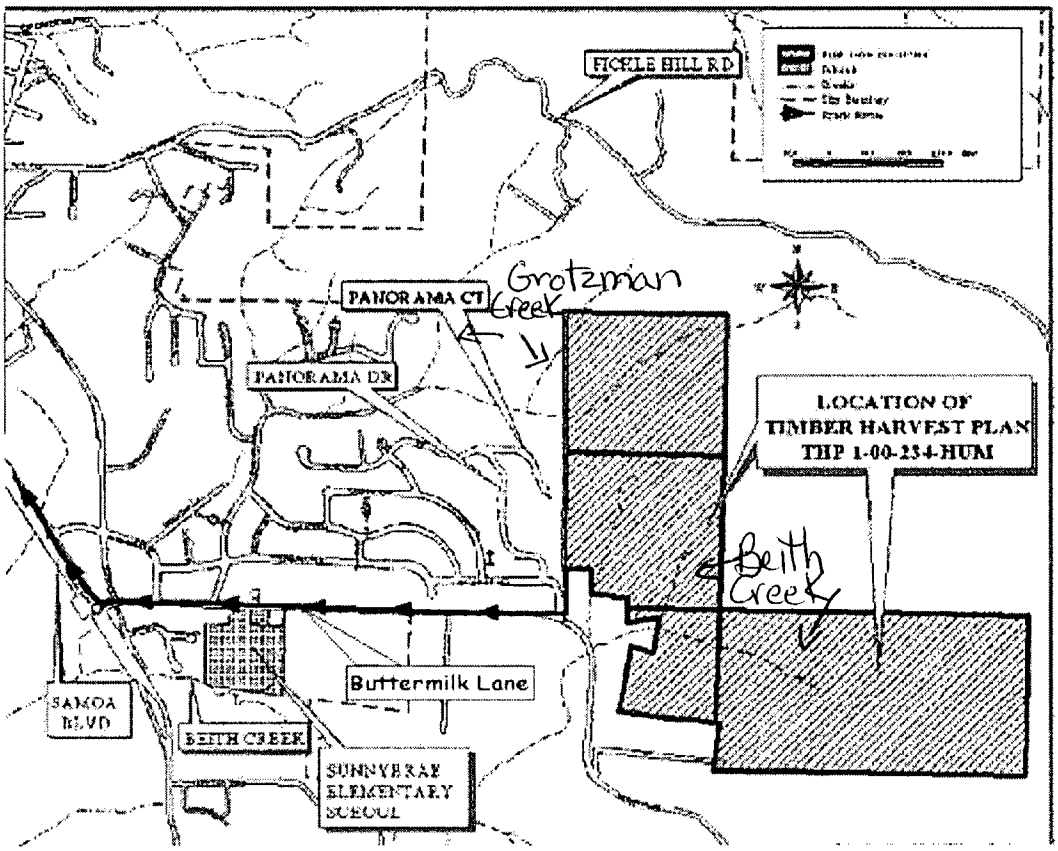
1992 Higgins et al, Humboldt Chapter American Fisheries Society

Year Unknown, Barrett *Transactions of America's Fisheries*

History report complied by SANA, Sunny Brae Arcata Neighborhood Alliance

Maps from Yahoo and SANA

Turbidity data complied by Clark Fenton with volunteer help


FICKLE HILL RD
PANORAMA CT
Grotzman Creek
PANORAMA DR
LOCATION OF
TIMBER HARVEST PLAN
THP 1-00-234-HUM
Beith Creek
Buttermilk Lane
SAMOA BLVD
BEITH CREEK
SUNNYBRAE ELEMENTARY SCHOOL

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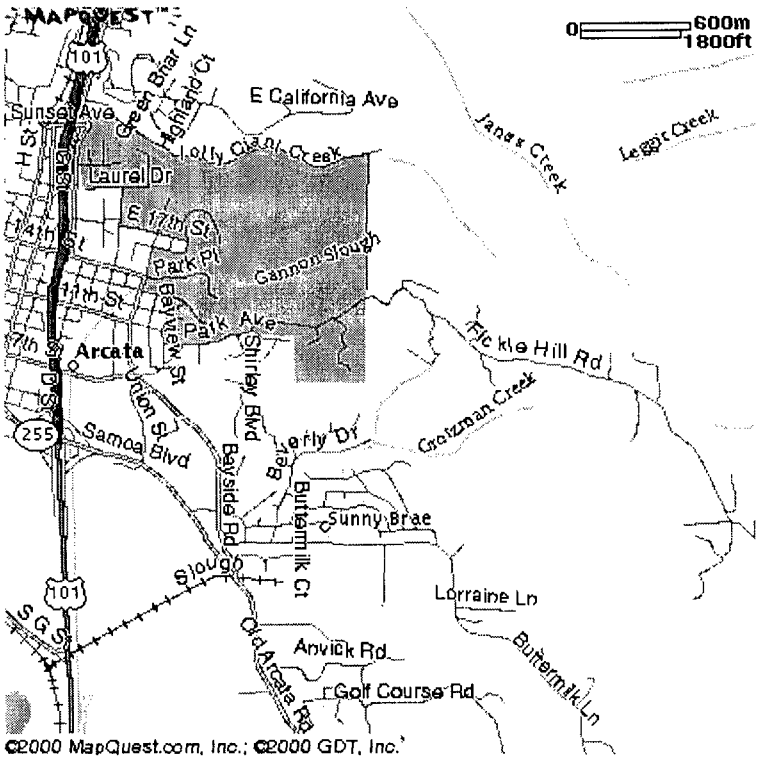


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# History Committee Research

# 08/14/00 DRAFT

Using THP#100234 HUM, SANA documents, library research, Internet research, and responses to questionnaires, this document was compiled and drafted by the committee gathering information about the physical history of the Sunny Brae and Arcata areas.

## OVERVIEW

On June 14th, Timber Harvest Plan (THP) #1-00-234 HUM was filed with the California Department of Forestry by Sierra Pacific Industries (SPI) for 171 acres on the southwest slope of Fickle Hill above and adjacent to Sunny Brae. The plan, in which SPI originally presented 20% selective cuts, has turned out to include a series of 17 clear-cuts equaling 28 acres and up to 2 _ acres each. Selection cuts will equal 73 acres, leaving 70 acres of deferred areas, and yielding an estimated harvest of 1 million board feet. The THP evolved from a three month, summer-only operation, to a possible three-year plan, including felling trees during winter. A geologic report, included in the THP, has identified 13 small to medium sized unstable areas within the plan, including landslides, some of which have already had impacts on **Grotzman Creek, Beith Creek, Gannon Slough**, and the surrounding neighborhood. In total, there are 2 _ miles of watercourses throughout the THP, four miles of roads and skids, and 16 creek crossings. The plan includes tractor logging on slopes over 65%.

As a result of the increase in logging cuts, duration of the logging operation, plus winter logging, citizens have become correspondingly concerned with this THP. Area residents are particularly informed regarding the environment and the logging industry. Due to such ecological literacy, many Sunny Brae neighborhood residents have expressed great concern being down hill from and adjacent to the THP in question. The Sunny Brae / Arcata Neighborhood Alliance (SANA) has been effectively working to ensure that Sierra Pacific's right to pursue a profit on it's timber-production zoned land does not come at the expense of the safety, property, or quality of life of the neighboring community. Citizen concerns expressed at the local SANA meetings included potential landslides from increased erosion, additional flooding from watershed disruption, and destruction of roads from logging truck traffic. Access to the site would be from Buttermilk Lane and Samoa Boulevard before leading to Arcata's main entrance and exit to Highway 101. SPI estimates 24 logging trucks a day (12 each way, twice daily) will use the city streets one of which passes directly in front of Sunny Brae Middle School on Buttermilk Lane. Citizens have also named the physical safety of schoolchildren and residents in truck traffic, increased truck traffic beyond normal business hours, reduction

of property values, and destruction of wildlife habitat as major concerns regarding the THP.

Citizens of Arcata, California, are a noted environmentally conscious population both in thought and action. Of particular concern is the health of the ecosystem especially the watersheds as they affect the quality of life. Any natural or human induced event which affects the watercourses, in this case super-surface and subsurface **Grotzman Creek** and **Beith Creek**, and **Gannon Slough**--which drains into protected Arcata Bay--will inevitably have detrimental impacts on water quality, water drain-off and wildlife habitat. In other words, SANA neighbors are mainly concerned with resultant flooding in areas surrounding the proposed logging site notably the Sunny Brae, Fickle Hill, and Jacoby Creek neighborhoods. It is understood that flooding inherently affects riparian zones, creek sedimentation levels, fish habitat, human residences, places of school, worship and business, and both arterial and connector roads.

The Sunny Brae neighborhood, directly downhill from the proposed steep logging site has a history of year round excess run-off and citizens have reported extensive and repeated repairs to their homes, properties and adjacent roads. Sunny Brae's year round run-off has increased because of past logging events and, during the rainy season, the neighborhood often floods causing both property and road damage. Some Sunny Brae residents have reported having to install sump pumps, French drains, and larger drainpipes to mitigate flood damage. Other residents have replaced water-damaged floors or have avoided using their flooded backyards during winter as a result of over-flowing local creeks. Such a presence of excessive water run-off, accumulation, and pooling under normal winter circumstances gives rise to citizen concerns regarding changes in watercourses that may induce additional flooding and erosion due to future logging.

The following research, particularly the expert reports in the *1998 Arcata General Plan: 2020*, excerpted in this report, further substantiate citizen concerns regarding flooding not only for the present health of the ecosystem and quality of life, but also for the significant impact flooding may have on future generations.

## FLOODING

According to the *1998 Arcata General Plan: 2020*: "The Federal Emergency Management Agency (FEMA) has estimated the areas inundated by floods that occur on average every 100 years (more frequent floods are smaller and would inundate smaller areas; the 100 year flood is commonly used in emergency planning.) These 100-year flood areas include:...Most of the land between Old Arcata Road and the Bay, including U.S. 101" (p. ___) Sunny Brae's **Gannon Slough** drains into this area and then into Arcata Bay. In turn, **Arcata Bay** drains into Humboldt Bay. Humboldt Bay, is California's second largest estuary with its northernmost basin being Arcata Bay, which is fed by four tidal sloughs--McDaniel, **Gannon**, Butcher and Mad River. (p. 6-3, *1998 Arcata General Plan: 2020*).

Flooding is a major hazard over most of the Coastal Zone in Arcata. Nearly all of the agricultural land and some of the industrial and residential land in the zone is within the 100 year flood plain....The southern portion of the area in the "Q" street to Buttermilk

Land section of the Coastal Zone is subject to flooding. The City recently changed the zoning on a 100-acre parcel west of U.S. Highway 101 from industrial to agricultural because of flooding and other environmental problems....A substantial portion of the vacant parcel between U.S. Highway 101 and Union Street is in the 100-year flood plain (p. VIII-2, *Coastal Land Use Element*, City of Arcata, August 1979).

In 1979, the city of Arcata analyzed the Coastal Land Use Element and reported the area's historical tendency to flood:

> Lands south and west of Arcata, as well as most of the East Bay plain, were originally salt marsh. Through diking and filling, these areas have been converted to agricultural, commercial, and residential uses. However, because of low elevations and high water table, flooding still occurs....Dikes have been constructed along the perimeter of the Bay and a the banks of Janes Creek/McDaniel Slough, **Gannon Slough**, and Jacoby Creek; the major work on these dikes was done in the early 1900's, with minimal maintenance being provided by the City in subsequent years (pp. XI-1 — XI-2).

The 1998 Arcata General Plan tends to corroborate these findings on pp. 5-12 — 5-13: "Arcata is subject to relatively frequent and extensive high flows in several of its small creeks. This problem results from characteristics of the drainage system:

- Arcata creeks originate on the hillsides, so rainfall rapidly drains into the center of town;
- The center of Arcata is relatively flat, so creeks slow down, deposit sediment, and widen in the areas most susceptible to flood damage;
- Accumulation of sediment and debris, and tide gates, reduce the ability of creeks to convey high flows;
- Urbanization causes higher runoff rates and reduces the wetland areas available for high flows to infiltrate to groundwater or to be detained; and
- Creeks and riparian areas have been extensively straightened or channelized and put in culverts, which reduces in-channel storage of floods and can cause flood waters to accumulate more quickly."

Arcata's creeks--Janes, Sunset, Jolly Giant, Campbell, Fickle Hill, Grotzman, Beith and Jacoby Creeks--and "their associated riparian zones provide wildlife habitat, flood control, recreation and scenic enjoyment, and educational opportunities. More specifically, riparian woodlands are characterized by high plant productivity supporting abundant and diverse wildlife species" (p. 6-3, *1998 Arcata General Plan: 2020*) and are, therefore, vital to the local ecosystem to protect and restore from future flooding.

The General Plan continues onto report the area's flood history: "The Mad River poses a second flood hazard for Arcata. The highest flood on record for the Mad River was in 1964, with an estimated flow of 81,000 cubic feet per second and a return interval of 50 years. This flood caused flow across Arcata Bottoms into **Arcata Bay** and significant

damage" (p. ?). Since **Gannon Slough** drains directly into Arcata Bay, flooding in the bay negatively effects **Grotzman Creek** which, in turn, drains into **Gannon Slough**.

While both "Janes Creek and **Grotzman Creek** have a combination of existing flooding problems as discussed in the previous section, and large areas of potential buildout, including in their headwaters" (p. 5-19, *1998 Arcata General Plan: 2020*), "**Grotzman Creek** has been extensively placed in culverts and backs up into residential areas." Therefore, with normal winter rainfall, **Grotzman Creek** floods regularly. The General Plan further states that there could be a distinct loss or degradation of sensitive habitats if watercourses are encroached upon by growth. It seems likely, then, that "The City's watercourses, which run throughout urban and residential areas, are especially vulnerable to encroachment and degradation" since "Arcata's stream courses currently serve as storm drains" (p. 6-20, *1998 Arcata General Plan: 2020*)

Furthermore, "Higher stream-flows and pollutants associated with urban runoff have already significantly altered the creeks from their natural condition. Portions of Janes, Jolly Giant, Campbell and **Grotzman Creeks** are culverted or covered, causing further degradation of creek resources (p. ___, *1998 Arcata General Plan: 2020*).

In *Clearcut: The Deforestation of America*, Nancy Wood summarizes the consequences of increased sedimentation in watercourses:

> The next worse effect of clearcutting is sedimentation caused by erosion when logging occurs on steep slopes or upon unstable soils. Hurlon C. Ray, director of water quality for the Pacific Northwest Division of the Environmental Protection Agency, testified that steams in logged areas have been found to contain 78,000 times more sediment than they contained before logging. Sedimentation from poor logging practices chokes streambeds many miles downstream. This causes loss of natural stream vegetation and destroys fish habitat. Silt in the spawning bed smothers the fish eggs, Ray said. And he added that clearcutting also leads to greater spring runoff, increasing the danger of floods (p. 23).

## CREEKS/RIPARIAN

"The Arcata planning area is influence hydrologically by many watersheds. A watershed is a region or area drained by a network of surface or subsurface watercourses and have the potential for impacts on coastal streams, wetlands, estuaries, and groundwater basins through runoff and percolation. (Eureka General Plan) Jacoby Creek, Jolly Giant Creek, Campbell Creek, **Grotzman Creek**, Janes Creek, and Mad River are each major watersheds located in the planing area. The City of Arcata contains several waterways in its planning area that convey water from the coastal mountains or upland areas east of the city which subsequently drain into Humboldt Bay. These waterways are usually referred to as creeks. As these waterways approach the bay they become tidally influenced; these sections of the waterways are referred to as sloughs. The riparian areas along these waterways are very important corridors of vegetative habitat and are vital to the survival of fish and wildlife" (Appendix, p. 8, *1998 Arcata General Plan: 2020*).

"Campbell, **Beith**, Fickle Hill, and **Grotzman Creeks**; and **Gannon Slough** drain the

southeastern portion of the City , which includes the communities of Bayside and **Sunny Brae**....Campbell, **Beith**, Fickle Hill and **Grotzman Creeks** flow separately through the agricultural land between Old Arcata Road and Highway 101, until they meet immediately east of Highway 101 and collectively form **Gannon Slough. Gannon Slough** is controlled by a tidegate on the east side of Highway 101, then flows west under Highway 101, and into Arcata Bay. Fish sampling has indicated that the tidegate is not a complete barrier to anadromous fish migration, as evidenced by the capture of juvenile salmon from Campbell Creek below Seventh Street. As of the 1998: Arcata General Plan: 2020, however, "Intensive studies of these four watersheds are limited" (Appendix, p. 13).

## BEITH CREEK

"The **Beith Creek** watershed drains the southwestern slopes of Fickle Hill. The size of the watershed is approximately 1-2 square miles. The lower portion of the creek was channelized sometime before 1941 and now flows year-round.

Cutthroat trout and silver salmon were once abundant in the creek, but now are limited. The creek has suffered from the cumulative impacts of land development and past/present management activities. The tidal floodgate on **Gannon Slough**, culverts, channelization, housing development, timber harvests, cattle grazing, and runoff from streets and a golf course, have probably negatively impacted **Beith Creek**. (Cannata 43) The riparian vegetation on **Beith Creek** consists largely of hardwoods, willow, alder, and some Sitka spruce (J. Williams 39). The presence of adequate riparian cover correlated with rearing pools in the streambed is uncommon in **Beith Creek**. The lack of adequate rearing habitat in addition to the other negative impacts discussed earlier has resulted in a dwindled fish population in **Beith Creek**.

Source:
Inventory Assessment of **Beith Creek**, Arcata, CA.

By J. Williams and S. Cannata, et al."

(Appendix, p. 14, *1998 Arcata General Plan: 2020*)

## GROTZMAN CREEK

"The **Grotzman Creek** watershed consists of two forks; the north and south. The main channel is a perennial first order stream. The predominant soil series in the watershed is of the Melbourne series with Hely becoming prevalent on the southern side of the south fork. Both of these soils are considered highly productive timber soil. The Melbourne series has a medium erosion hazard while Hely has a high erosion hazard. Approximately 3 _ years ago [1994 or 1995?], a slide occurred on county land in the upper portion of the watershed which has resulted in increases of sedimentation in the streambed.

....The Riparian zone is provided cover by a diversity of species including coast redwood, red alder, redwood sorrel, sword fern, and rushes. The creek also

contains a lot of woody debris which provides substrates for lower trophic level aquatic organisms that subsequently provide food for fish. The woody debris is also important because it helps to create rearing pools for young fish.

Although the creek looks healthy, a study done by Susan Bowie in 1993 indicated that no fish were present on either fork of **Grotzman Creek.** Bowie did observe many Pacific giant salamanders and invertebrates.

Source:

Bowie, Susan. A Biological Field Study of Fish Habitat on the North and South Forks of **Grotzman Creek**, Arcata, CA. Dept. of Wildlife, Humboldt State Univ. Arcata, CA 95521. Jan-May 1993."

(Appendix, p. 14, *1998 Arcata General Plan: 2020*)

# SUNNY BRAE FLOODS:

The following citizens have reported flooding in the Sunny Brae neighborhood:

### *Beverly Drive under which Grotzman Creek flows:*

281 Beverly Drive, Arcata, CA 95521

Fenton, Clark

Recalls debris on Beverly from flooding. Has documented Grotzman Creek at high flows during winter with photographs and has current water quality samples showing sedimentation levels.

647 Beverly Drive, Arcata, CA 95521

Cameron, Bruce M.

In 1997 Beverly Drive flooded causing damage to property. Water damage resulted in cracks in driveway and a flooded crawl space under the house. Two sump pumps were bought, burned-up and replaced. The insulation under the house got wet and was also replaced. The flooring got wet and has never been the same. Has possible receipts for documentation.

647 Beverly Drive, Arcata, CA 95521

Gonsalves, Peter

Reports continuous run-off from upper Beverly Drive. Flooding occurs under house where pump has been placed. In fact, several pumps have burned out. It one walks up Beverly Drive, one will see that no photos or videos needed are needed. There is ample evidence that water flows up from the cracks in road down hill, 24 hours a day, seven days a week.

1708 Beverly Drive, Arcata, CA 95521

Drabkin, Elizabeth

"I am the current resident at 1708 Beverly Drive, and my experience with flooding was after Edith Stromberg, who continues to log, cut 35 acres on the hill in back of Beverly Drive, either in '96 or '97. The winter directly after the logging operation, Beverly Drive flooded, we had to sandbag,

people could not back their cars out of their driveways, etc. I created a sandbag wall to protect my house, but the water started coming up in my neighbor's yard like geysers. It was coming up through the ground, as our underground drainage pipe was blocked by a large piece of "slash," which is wood that was scrapped and burned after the logging. Being downhill from my neighbor, the water started lifting the bricks in my walkway, as well as causing damage to my driveway, which is documented, as I had a homeowner's insurance agent inspect it. Additionally, the ground between my neighbor's and my house became so waterlogged, that it could not support the weight of the three 20 year old pine trees that were there, and the trees which were very tall, toppled, missing a car by inches, completely blocking the street, and pulling down power lines. Two trees fell, the third tree I had to have cut because it was leaning and I was afraid it would fall on my house."

1708 Beverly Drive, Arcata, CA 95521

Armstrong, Susan

(Year 1975) "Drive flooded and kids rode rafts down the road. Sandbags saved many house floors. Dot Sundstrom's family room flooded. Main damage was in lifting of floor tiles. I had to have a sump pump running permanently while I lived there 1972-1981. Strong and united neighborhood opposition (Beverly Drive) resulted in Stromberg's proposed 1975 building of houses on Panorama being modified so that: no logging (to build homes on Panorama) allowed within 25 feet of property lines of homeowners on Beverly. The last two lots he had planned were not allowed (above end of Beverly). He was required to build Sunny Brae Park."

## *Panorama Drive (which borders the THP)*

Draper, Margaret

"Live on Panorama Drive. Concerned about sliding/scouring of Grotzman–we live steeply perched above Beverly Drive. We live on a property that shows evidence of movement, jackstrawed trees, ground cracks. We have concerns that damage to Grotzman could result in scouring of the channel below us in Beverly cul de sac w/ resultant collapsing of sides of the drainage, which would affect us. Our land is unstable and we do not want triggers. The cracks in our soil could be photographed."

2210 Panorama Drive, Arcata, CA 95521

Harrell, Bryant & Elizabeth Harrell

Logging will occur right behind us. Our garage is permanently very damp. Tools rust. Fickle Hill is full of springs. One flows out of the Durbins' property into the Gaasches' driveway all winter, and then flows strongly down the gutter in front of our property."

Lives within 300 ft. Panorama Court.

Baralca, Carmen

"I work at home art and writing. I will not be able to do either while this goes on. We already have full capacity water coming down our driveway in winter. Anymore than that would no doubt cause problems."

## Shirley Drive (west of THP site)

K C Roberts (Currently lives on Fickle Hill Road)

Owned a home on Shirley Drive in late 70's — early 80's. Experienced continual erosion and run-off problems. Concern for the stability of the slope caused him to sell his home in 1981. In the winter of 81— 82, he saw a picture of his house on the front page of the newspaper, with a slide wrapped around it (type and amount of damage unknown).

## Virginia Lane (parallels Grotzman Creek)

1635 Virginia Way, Arcata, CA 95521

Martinez, Lynne

"We have a crack in the wall and our front door sticks when the earth shifts. When we lived on Crescent Way, we had a creek running under the floorboards of our closet."

## Chester Street

1203 Chester Ave, Arcata, CA 95521

Sorter, Andrew and Heather

"Lifetime Sunny Brae resident. Sandbagging in front of my house in 1998." (See entry regarding father's house 1762 Buttermilk, James Sorter.)

## Crescent Way

965 Crescent Way, Arcata, CA 95521

McFarland, Jeanne

"This could adversely affect my property value if the harvest is not done with utmost caution on unstable (potential) slopes. Excess water run-off through my backyard. (I've lived there for 10 years). Our soil is only 1_" deep until CLAY (impermeable) is reached. This run-off happens whenever back-to-back storms happen. All of the Sunny Brae low lands are threatened by an increased peak overland flow off of clear cuts above us. The house below me (945?) on the S.E. corner of Crescent and Bayside, turns into a swamp and small lake (photos available after ANY storm). Visible drainage/run-off ditches in my backyard."

Past address: Crescent Way

Current address: 1635 Virginia Way, Arcata, CA 95521

Martinez, Lynne

"When we lived on Crescent Way, we had a creek running under the floorboards of our closet."

## Buttermilk Lane (borders Beith Creek)

1456 Buttermilk Lane, Arcata, CA 95521

Dresser, Philip

"I've lived at this location since November 1979. By December or January of every year, one day of steady rain brings standing water in my backyard which takes at least one day (with no rain) to run off. Most years the back yard is not usable until March or April."

1740 Buttermilk Lane, Arcata, CA 95521

Kuttner, Guy & Cindy

"The drainage in our backyard (the cul-de-sac at St. Alban's church) became so bad 5 years ago that we had standing water year round, rendering any area outside the house useless–The city of Arcata, while not accepting blame, paid for materials (we supplied labor) to help us excavate our yard, laying 300' of French drains–after PG&E logging adjacent to THP, the drains were inadequate and we sandbagged our house–in early 90's a mix of heavy rain, then sleet, then earthquake facilitated that fall of a tree with a 36" diameter. Luckily, it missed our house and fence, landing in our yard. This is to say that our neighborhood is vulnerable to unpredictable natural forces. [Documentation] photos, receipts, and records at city of Arcata, and Winzler and Kelly (Gary Davidson).

1762 Buttermilk Lane, Arcata, CA 95521

Sorter, James

Reports: "30 years flooding in back yard and road deterioration."

2777 Buttermilk Lane, Arcata, CA 95521

Redwine, Craig

"My property is bordered on 2 sides by Beith Creek. I have a well that is my only source for domestic water supply."

## Crestwood Drive (East edge of THP site)

799 Crestwood Drive, Arcata, CA 95521

Jack and Rusty Stoob

Along with other neighbors, experienced a slide off of a neighboring property. "...our own and two other homes' access roads were covered to a depth of some four or so feet in debris. Also, the debris did flow to within about a foot of one home, completely ruining that home's back yard." "It cost the five homeowners affected $6,971.96 to have the debris removed. It took some 40+ truckloads, 57 hours of trucking effort, and a small fee for one dumpsite for the material."

An engineering report, prepared by Winzler and Kelly of Eureka, describes the slide as 200 feet long and up to 80 feet wide, and on a slope of 55% to 65%. It also notes that there had been some grading or road-building at the upper-end, which may have provoked the slide. The report concludes that more sliding may be expected, and that it may again block the access road. To protect against further damage the report suggests construction of a retaining wall, 60 feet wide and 15 feet tall, at an estimated cost of $125,000.

- **ADDRESS?**

100 to 200 feet from the power lines. Panorama area. Top of hill.

Nichols, Karen

"The last clear cutting due to Davies Tree Co. really destroyed the mountain. They had to cut due to keeping the lines clear for PG&E, but they really cut the water bars deep. The natural water flow down the mountain flows to the right–towards my property. If there is more equipment traffic and re-cutting of new water bars, I'm concerned about the stability of the mountain–shifting and also the PG&E towers."

300 ft. from THP

Wrenden, Denise

This THP "Affects the entire town as even visitors driving through town will see the land raped by this. Roads are full of big pocks getting bigger all the time. Major water run-off down hill from other house. I fear [that if an] earthquake happened it would cause unbelievable damage. A landowner down hill cut a number of trees causing our house to shudder and quake for every tree that fell."

## RIPARIAN LIFE

Riparian plant communities in the Planning Area include the Arroyo willow series, Hooker willow series, Mixed willow series, and Red alder series. These series exhibit an overlap in species composition, but they vary in the dominance of canopy species. Artroyo willow (*Salix lasiolepis*) most frequently dominates Arcata's creekside zones. Hooker willow (*Salix hookeriana*) stands are found close to the coast. Other willow species common in the Planning Area include Sitka willow (*s. sitchensis*) and Pacific *willow (S. lucida* ssp. *Lasiandra*). Red alder (*Alnus rubra*) is the dominant tree in stands bordering the upper reaches of the mad River in the Planning Area. Commonly associated species include bigleaf *maple (Acer macrophyllum*) and black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) (p. 6-3 — 6-?, *1998 Arcata General Plan: 2020)*

(p. 6-13, *1998 Arcata General Plan: 2020*)

- Red alder riparian forest (Red Alder series) is rated G3 S3.2. The global ranking is 10,000-50,000 acres remaining, and the state ranking is "threatened" with 10,000-50,000 acres remaining.

- North coast riparian scrub / forest (Arroyo willow, Hooker willow, and Mixed willow series) is rated G3 S3.2. The global ranking is 10,000-50,000 acres remaining, and the state ranking is "threatened" with 10,000-50,000 acres remaining.

- North coast black cottonwood riparian forest (Black cottonwood series) is rated S1.1., the most sensitive state ranking: "very threatened" with less than 2000 acres remaining. No global ranking has been established. The Black cottonwood series is not well-established in the Planning Area. Black cottonwood occurs as a component of the Red alder series, found bordering the mad River, but the species does not reach a position of dominance in this area. Not far south of the planning area, bordering the Eel River, are the largest low elevation stands of the Black cottonwood series in California.

(p. 6-19, *1998 Arcata General Plan: 2020*)

Impact: Reduction in Population or Range of Rare, Threatened, or Endangered Species

Analysis of Impact: Habitat encroachment as a result of development is of special concern in areas where rare, threatened, or endangered species are known to occur. For species having limited distribution, the loss of even small amounts of habitat can lead to critical declines in the population and may eventually lead to elimination of the species.

(p. 6-20, *1998 Arcata General Plan: 2020*)

Impact: Loss or Degradation of Sensitive Habitats

Loss of riparian vegetation can cause erosion of stream banks, which adds sediments to the creeks and reduces water quality.

## MEDIA REPORTS FLOODING

The media has also recorded past flooding events in the area. Dorothy Frank reports, on page 13, in *West Coast Disaster–California and Oregon*, that on Columbus Day in 1962:

> Humboldt County, California felt the brunt of the storm on Thursday, as well as Friday, when virtually every community in the area was thrown into darkness and without telephone communication. Some of the communities experiencing such were: Orick. Trinidad, Big Lagoon, Orleans, Hoopa, Willow Creek, Salyer, Carlotta, Swain's Flat, Bridgeville, Fruitland, Fort Seward, Garberville, Weott, Meyers Flat, Petrolia, Honeydew, Capetown, portions of Eureka, Bayside, parts of Arcata, Blue Lake and McKinleyville.
>
> Storm damages were mounting into the thousands of dollars as gales of hurricane force, driving saturating rains before them, continued on Friday the 12th as well as on Thursday. At the height of the downpour, all the major rivers in Humboldt County were rising with the greatest threat recorded at Fernbridge where the river was expected to crest at 18 feet, a half foot above flood Stage.

*The Redwood Record*, contains a February 27, 1986 report about a subsequent Humboldt County Flood. On page 59 of the Garberville daily, one finds "Hundreds Evacuated: Humboldt Listed" as President Ronald Reagan declares Humboldt County a national disaster area due to flooding.

President Reagan finally added Humboldt to the list of flood ravaged counties in California designated as federal disaster areas...The reason we were not put in the original group is because federal officials must verify our damage estimate figures," Mike Maguire of the Office of Emergency Services told county supervisors Tuesday. "They couldn't make it up here because the roads were closed."

## EARTHQUAKES: The Potential to Increase Flooding & Erosion

In addition to the potential increase in flooding due to logging, SANA is concerned with both the triggering and the exacerbating of the effects of local earthquakes. After all, the Fickle Hill Fault Zone–an active Holocene fault--runs through the THP in question.

In the *Coastal Land Use Element*, published by the City of Arcata, in August 1979, there are the following geologic hazards in the Arcata Coastal Zone. The report begins with "The entire Coastal Zone in Arcata is subject to high groundshaking" since:

> The Arcata Coastal Zone is located in a seismically active area. The effects of earthquakes on a number of regional faults will be felt in the Coastal Zone. The two most important faults are the San Andreas Fault, which is expected to be the source of an 8.0 to 8.5 magnitude earthquake in the next 50 to 100 years; and the Falor-Korbel Fault, which is expected to generate the following activity:
>
> Magnitude Recurrence Level
>
> 100 years

250 years

> The expected maximum ground acceleration in the Coast Zone from activity on the Falor-Korbel Fault will exceed the lateral force requirements of the 1973 UBC by four to five times; and, the San Andreas Fault will produce maximum ground accelerations of about 150% of the 1973 BUC requirements.
>
> Liquefaction is the major seismic hazard in the Arcata area. The flatlands to the west and south of town are underlain by alluvial deposits and former bay muds, and are classified as having a high liquefaction potential....The Arcata General Plan states that a critical facilities should not be located in an area of high liquefaction potential. The entire Coastal Zone in Arcata is an area of potentially high liquefaction.
>
> The following public and private critical facilities in the Coastal Zone are presently located in an area of high liquefaction potential.
>
> California Highway Patrol Office
>
> U.S. Highway 101 and the Samoa Boulevard overpass
>
> Bloomfield School, Jacoby Creek School, St. Mary's School, and Equinox School (pp. VIII-1 - VIII-2)

The following excerpts from An Explanatory Text to Accompany the Fault Activity Map of California and Adjacent Areas, by Charles Jennings, substantiates the above findings. In regards to faults and future earthquakes, Jennings explains on page 3:

> The faults shown on the *Fault Activity Map of California and Adjacent Areas* have been ruptured at least once in the geologic past, but which ones are likely to cause earthquake sin the future? No clear-cut answer exists because the mechanics governing earthquakes are still not fully understood. Our best judgment is based on whether a fault is actively slipping or has had displacement in the recent geologic past,. However, several recent earthquake shave been attributed to "blind" faults under folded terrain and these faults are much more difficult to recognize.

Jennings continues on page 4:

> Although it is not possible to tell if a fault will be reactivated, we assume that if a fault has been active for millions of years and has been active in historic or recent geologic (Quaternary) time, it is very likely to become active again. This assumption is borne out by studies of historically active faults in California and elsewhere.
>
> In California, special definitions for active faults were devised to implement the Alquist-Priolo Special Studies Zones Act of 1972, which regulates development and construction in order to avoid the hazard of surface fault rupture. The State Mining and Geology Board established Policies and Criteria in accordance with

the Act. They defined an "active fault" as one which has "had surface displacement within Holocene time (about the last 11,000 years).

The Fickle Hill Fault and nearby McKinleyville Fault zones are both Holocene Faults (p. 25). Jennings reports that " Of recent concern is the possibility that faults, even geologically ancient ones (that is, pre-Quaternary), can be reactivated by the influences of man." According to the map legend associated with Jenning's *An Explanatory Text to Accompany the Fault Activity Map of California and Adjacent Areas*, Holocene fault displacement (during past 10,000 years) without historic record can be evidenced by such Geomorphic features as: sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. According to the legend explanation: "Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting."

## CONCLUSION

The concern for the health of the natural, physical and social environments are repeatedly echoed in the 1998 City of Arcata General Plan: 2020 and substantiated by additional research. The Arcata area has a history of flooding and problematic watercourses. It seems prudent for SANA to question steps being taken that will further detriment local waterways. Since the cumulative effects of land management practices are more clearly understood today than during the 1975 logging of the same forest, the consequences of these effects on creeks and watersheds are known to be heavier, more costly, and longer lasting. To remedy such cumulative effects, there are current city and neighborhood plans and actions for not only protecting, but also restoring Arcata's riparian zones and watersheds. To reiterate, SANA, according to its mission statement, respects Sierra Pacific's right to pursue a profit on it's timber-production zoned land providing that it does not come at the expense of the safety, property, or quality of life of the neighboring community. While SANA is concerned with the present potential landslides from increased erosion, additional flooding from watershed disruption, and destruction of roads from logging truck traffic, it is also concerned with the consequences such detrimental effects will have on future generations.

Checked by C. Fenton

Provisional

By C. Fenton

4/25/01

**Grotzman Creek (GRTZ)**

Humboldt County, California

Hydrologic Year 01

Grab Sampling: Turbidity / Suspended Sediment Data

Salmon Forever / Sunny Brae Sediment Lab

| Sign-in Page # | Data Sheet # | Sample ID# | Location Sampled | Date Sampled | Time Sampled | Sampled By | Turbidity FTU | Tur. Code | Container Type | Turbidity Date run | Turbidity Time run | Turbidity By | Tum S/N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | na | GRTZ1 | 8/6/00 | 14:30 | C. Fenton | 11.9 | 0 | H | 08/6/00 | 14:31 | C. Fenton | 9614 |
| | | na | GRTZ2 | 8/6/00 | 14:52 | C. Fenton | 26.3 | 0 | H | 08/6/00 | 14:55 | C. Fenton | 9614 |
| | | na | GRTZ3 | 8/6/00 | 15:10 | C. Fenton | 11.1 | 0 | H | 08/6/00 | 15:15 | C. Fenton | 9614 |
| | | na | GRTZ5 | 8/6/00 | 18:45 | C. Fenton | 6.1 | 0 | H | 08/6/00 | 18:46 | C. Fenton | 9614 |
| 2 | | O1GR 0251 | GRTZ5 | 9/2/00 | 11:00 | C. Fenton | 7.6 | 0 | H | 09/2/00 | 18:00 | C. Fenton | 9614 |
| 2 | | 01GR 0254 | GRTZ1 | 9/2/00 | 11:45 | C. Fenton | 9.0 | 0 | H | 09/2/00 | 18:10 | C. Fenton | 9614 |
| | 6 | O1GR 0028 | GRTZ1 | ####### | 07:00 | R. Moore | 23.3 | 0 | H | 11/2/00 | 19:47 | C. Fenton | 9614 |
| 2 | 6 | 01GR 0030 | GRTZ1 | ####### | 17:30 | R. Moore | 144.0 | 0 | H | 11/14/00 | | R. Moore | 9614 |
| 5 | | 01GR 0121 | GRTZ1 | ####### | 07:02 | C. Fenton | 226.0 | 0 | H | 11/29/00 | 7:08 | C. Fenton | |
| 70 | | O1GR 0026 | GRTZ1 | ####### | 08:30 | R. Moore | 95.8 | 0 | H | 03/8/01 | 11:14 | C. Fenton | #### |
| 70 | | O1GR 0114 | GRTZ1 | 1/8/01 | 12:25 | R. Moore | 61.0 | 0 | H | 03/8/01 | 11:10 | C. Fenton | #### |
| 17 | | 01GR 0103 | GRTZ1 | 1/25/01 | 09:17 | C. Fenton | 32.5 | 0 | H | 01/25/01 | 17:47 | C. Fenton | #### |
| 58 | | 01GR 0638 | GRTZ1 | 2/21/01 | 07:01 | C. Fenton | 42.4 | 0 | H | 03/1/01 | 10:39 | D. VanDyke | #### |
| 102 | | 01GR 0113 | GRTZ1 | 4/6/01 | 16:50 | R. Moore | 926.0 | 0 | H | 04/25/01 | 16:10 | C. Fenton | 9614 |

**Grotzman Creek (GRTZ)**

Humboldt County, California

Hydrologic Year 01

Grab Sampling: Turbidity / Suspended Sediment Data

Salmon Forever / Sunny Brae Sediment Lab

| Tare Bottle Weight g | Total Bottle Weight g | Volume Bottle Wt. | Filter Total | Filter ID | Init. Filter Weight g | Final Filter Weight g | Sediment Wt. | Lab Code | Fine Mg/L | Sand Fr. Mg/L | Total Mg/L | FTU Turbidity | Container Type | Date Sampled | Time Sampled |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | 11.9 | H | 8/6/00 | 14:30 |
| | | | | | | | | | | | | 26.3 | H | 8/6/00 | 14:52 |
| | | | | | | | | | | | | 11.1 | H | 8/6/00 | 15:10 |
| | | | | | | | | | | | | 6.06 | H | 8/6/00 | 18:45 |
| | | | | | | | | | | | | 7.55 | H | 9/2/00 | 11:00 |
| | | | | | | | | | | | | 8.98 | H | 9/2/00 | 11:45 |
| 18.1 | 36.2 | 18.1 | 1 1 | 101 | 0.09971 | 0.09976 | 0.00005 | 0 | 2.76 | | 2.76 | 23.3 | H | ####### | 07:00 |
| 18.2 | 38.3 | 20.1 | 1 1 | 102 | 0.11161 | 0.1148 | 0.00319 | 0 | ##### | | 158.72 | 144 | H | ####### | 17:30 |
| | | | | | | | | | | | | 226 | H | ####### | 07:02 |
| | | | | | | | | | | | | 95.8 | H | ####### | 08:30 |
| | | | | | | | | | | | | 61 | H | 1/8/01 | 12:25 |
| | | | | | | | | | | | | 32.5 | H | 1/25/01 | 09:17 |
| | | | | | | | | | | | | 42.4 | H | 2/21/01 | 07:01 |
| | | | | | | | | | | | | 926 | H | 4/6/01 | 16:50 |

| Raw Stage | Stage | Discharge CFS | Vel. Strand hi or lo | Velocity distance | Velocity sec. | Comments |
|---|---|---|---|---|---|---|
| 2" | | | HI | 5.0' | 4.10 | width 10" intake structure at top of Beverly Drive Picture 1 2 3 |
| | | | | | 3.40 | |
| | | | | | 3.10 | |
| 1" | | | HI | 3.0' | 3.20 | Small trib Beverly Way Picture #4 4' diameter stand pipe |
| | | | | | 4.20 | |
| | | | | | 3.00 | |
| 8.5" | | | HI | 3.0' | 12.40 | 991 Shirley culvert downstream of shirley picture #5 |
| | | | | | 12.10 | |
| | | | | | 17.10 | |
| | 0.50 | | HI | 10.0' | 6.00 | box culvert downstream old Arcata Road staff plate 40" wide |
| | | | | | 9.00 | |
| | | | | | | |
| | 0.60 | | HI | 5.0 | 6.65 | rain last night 0.1 - 0.2" - No ssc |
| | | | | | 5.80 | |
| | | | | | 5.60 | |
| 1" | | | HI | 4.0 | 2.19 | 1" deep 6" wide intake structure |
| | | | | | 2.77 | |
| | | | | | 2.34 | |
| 1' | | | | | | |
| | 0.75 | | HI | 10' | 5.00 | rain start 11-13 5am |
| | 0.79 | | | | | 0.80" rain last night |
| | 0.76 | | HI | 10' | 7.00 | rain start 11-28 22:00 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | 0.70 | | HI | 10' | 6.00 | rain start 1-7-01 19:00 |
| | 0.61 | | | | | rain start 07:30 |
| | 0.36 | | | | | cloudy heavy rain at 04:45 am |
| | 0.75 | | HI | 10' | 3.00 | After 1.5 days heavy rain |

By C. Fento 4-25-01

| Sign-in Page # | Data Sheet # | ID # | Location | Date Sampled | Time Sampled | Sampled By | Turbidity FTU | Tur. Code | Container Type | Turbidity Date run | Turbidity Time run | Turbidity By |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | na | BET/G.C.RD | 08/06/00 | 15:35 | cf | 0.97 | 0 | h | 8/6/00 | 15:36 | cf |
| 2 | | 01GR 0253 | BET/G.C. | 09/02/00 | 11:30 | cf | 1.62 | 0 | h | 9/2/00 | 18:06 | crf |
| 2 | na | 01GR 0002 | BET1 | 10/19/00 | 17:30 | C.F. | 0.69 | 0 | H | 10/19/00 | 17:32 | C.F. |
| 2 | | 01GR 0107 | BET1 | 10/28/00 | 09:37 | cf | 3.56 | 0 | h | 12/3/00 | 22:40 | cf |
| | 6 | 01GR 0029 | BET1 | 10/30/00 | 07:00 | R. Moore | 11 | 0 | h | 11/2/00 | 19:45 | cf |
| 2 | 6 | 01GR 0027 | BET1 | 11/13/00 | 17:45 | R. Moore | 56.3 | 0 | h | 11/14/00 | | R. Moore |
| 5 | 6 | 01GR 0122 | BET1 | 11/29/00 | 07:17 | CF | 118 | 0 | H | 11/29/00 | 07:20 | CF |
| 70 | | 01GR 0025 | BET1 | 11/29/00 | 08:40 | R. Moore | 63.5 | 0 | H | 3/8/01 | 11:13 | CF |
| 70 | | 01GR 0111 | BET1 | 01/08/01 | 11:35 | R. Moore | 47 | 0 | h | 3/8/01 | 11:16 | cf |
| 17 | | 01GR 0106 | BET1 | 01/25/01 | 09:21 | CF | 14.5 | 0 | H | 1/25/01 | 17:51 | CF |
| 58 | | 01GR 0639 | BET1 | 02/21/01 | 07:09 | CF | 26.3 | 0 | H | 3/1/01 | 10:42 | D. Vdyke |
| 60 | | 01GR 0721 | BET1 | 03/04/01 | 13:26 | CF | 12.9 | 0 | H | 3/4/01 | 21:45 | CF |
| | | 01GR 0109 | BET1 | 04/06/01 | 17:00 | RM | 229 | 0 | H | 4/25/01 | 16:07 | CF |
| 18 | | 01GR 0350 | BET2 | 01/06/01 | 14:40 | K. Willits | 6.39 | 0 | h | 1/6/01 | 14:46 | cf |
| 18 | | 01GR 0351 | BET2 | 01/08/01 | 15:32 | K. Willits | 24.4 | 0 | h | 1/20/01 | 12:24 | cf |
| 18 | | 01GR 0352 | BET2 | 01/09/01 | 16:17 | K. Willits | 17.4 | 0 | h | 1/20/01 | 12:25 | cf |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | | 01GR 0346 | BET2 | 01/10/01 | 15:22 | K. Willits | 60.2 | 0 | h | 1/20/01 | 12:26 | cf |
| | 10 | 01GR 0348 | BET2 | 01/11/01 | 14:12 | K. Willits | 10.3 | 0 | h | 2/11/01 | 11:53 | cf |
| 18 | | 01GR 0347 | BET2 | 01/14/01 | 16:34 | K. Willits | 11.2 | 0 | h | 1/20/01 | 12:32 | cf |
| 18 | | 01GR 0305 | BET2 | 01/16/01 | 16:24 | K. Willits | 5.68 | 0 | h | 1/20/01 | 12:34 | cf |
| 14 / 18 | | 01GR 0306 | BET2 | 01/20/01 | 22:16 | K. Willits | 7.23 | 0 | h | 1/20/01 | 12:32 | cf |
| 14 | | 01GR 0606 | BET2 | 02/24/01 | 12:09 | K. Willits | 11.9 | 0 | h | 2/26/01 | 19:05 | cf |
| 14 | 10 | 01GR 0307 | BET2 | 01/23/01 | 17:27 | K. Willits | 78.1 | 0 | h | 2/11/01 | 11:47 | cf |
| 14 | 10 | 01GR 0308 | BET2 | 01/25/01 | 11:33 | K. Willits | 15 | 0 | h | 2/11/01 | 11:49 | cf |
| 14 | 10 | 01GR 0309 | BET2 | 01/29/01 | 14:05 | K. Willits | 13.4 | 0 | h | 2/11/01 | 11:50 | cf |
| 14 | 10 | 01GR 0310 | BET2 | 02/09/01 | 11:53 | K. Willits | 17.1 | 0 | h | 2/11/01 | 11:52 | cf |
| 14 | | 01GR 0604 | BET2 | 02/21/01 | 16:13 | K. Willits | 24.4 | 0 | h | 2/26/01 | 19:01 | cf |
| 14 | | 01GR 0605 | BET2 | 02/22/01 | 13:51 | K. Willits | 40.1 | 0 | h | 2/26/01 | 19:03 | cf |
| 60 | | 01GR 0723 | BET2 | 03/04/01 | 12:07 | CF | 13.4 | 0 | H | 3/4/01 | 12:21 | CF |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BET3 | 08/06/00 | 15:50 | cf | 6.58 | 0 | h | 8/6/00 | 15:55 | cf |
| 3 | 01GR 0252 | BET3 | 09/02/00 | 11:15 | CF | 7.86 | 0 | H | 9/2/00 | 18:03 | CF |
| | 01GR 0464 | BET3 | 02/20/01 | 15:00 | Cassie E. | 44.5 | 0 | h | 2/20/01 | 15:49 | S. Farhi |
| 79 | 01GR 0465 | BET3 | 02/21/01 | 06:21 | S. Farhi | 105 | 0 | h | 3/19/01 | 13:50 | S. Farhi |
| 79 | 01GR 0467 | BET3 | 02/21/01 | 07:08 | S. Farhi | 97.3 | 0 | h | 3/19/01 | 13:54 | S. Farhi |
| 79 | 01GR 0239 | BET3 | 02/21/01 | 16:55 | S. Farhi | 38.1 | 0 | H | 3/19/01 | 13:57 | S. Farhi |
| | | | 02/21/01 | 16:55 | | | | | | | |
| | | | 02/21/01 | 16:55 | | | | | | | |
| | | | 02/21/01 | 16:55 | | | | | | | |
| | | | 02/21/01 | 16:55 | | | | | | | |
| | | | 02/21/01 | 16:55 | | | | | | | |
| 79 | 01GR 0082 | BET3 | 02/21/01 | 17:30 | S. Farhi | 48.2 | 0 | h | 3/19/01 | 14:00 | S. Farhi |
| 79 | 01GR 0710 | BET3 | 03/01/01 | 19:00 | Cassie E. | 2.97 | 0 | h | 3/19/01 | 13:38 | S. Farhi |
| 79 | 01GR 0708 | BET3 | 03/01/01 | 23:00 | Cassie E. | 12.1 | 0 | h | 3/19/01 | 13:39 | S. Farhi |
| 79 | 01GR 0709 | BET3 | 03/02/01 | 01:30 | Cassie E. | 25.3 | 0 | H | 3/19/01 | 13:42 | S. Farhi |
| 79 | 01GR 0711 | BET3 | 03/04/01 | 13:30 | Cassie E. | 22.1 | 0 | h | 3/19/01 | 13:44 | S. Farhi |
| 79 | 01GR 0707 | BET3 | 03/04/01 | 18:50 | Cassie E. | 104 | 0 | H | 3/19/01 | 13:47 | S. Farhi |
| 101 | 01GR 0800 | BET3 | 04/02/01 | 11:15 | S. Farhi | 79.5 | 0 | H | 4/20/01 | 15:07 | S. Farhi |
| 101 | 01GR 0782 | BET3 | 04/02/01 | 11:45 | S. Farhi | 101 | 0 | h | 4/20/01 | 15:11 | S. Farhi |

**Beith Creek**

Humboldt County, California

Hydrologic Year 01

Grab Sampling: Turbidity / Suspended Sediment Data

Salmon Forever / Sunny Brae Sediment Lab

| Tum# | Tare Bottle Weight g | Total Bottle Weight g | Volume/ Bottle Wt. | Filter Total | Filter ID | Initial Filter Weight g | Final Filter Weight g | Sediment Wt. | Lab Code | Fne Mg/l PPM | Sand Fr. Mg/L | Total Mg/L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9614 | | | | | | | | | | | | |
| 9614 | | | | | | | | | | | | |
| 22423 | 18.1 | 37.1 | 19.0 | 1 1 | 98 | 0.11126 | 0.11132 | 0.00006 | 0 | 3.16 | | 3.16 |
| 9614 | 18.3 | 35.0 | 16.7 | 1 1 | 100 | 0.11337 | 0.11379 | 0.00042 | 0 | 25.15 | | 25.15 |
| 9614 | 18.0 | 38.3 | 20.3 | 1 1 | 103 | 0.11265 | 0.11398 | 0.00133 | 0 | 65.52 | | 65.52 |
| | 18.1 | 37.0 | 18.9 | 1 1 | 108 | 0.11247 | 0.11446 | 0.00199 | 0 | 105.30 | | 105.3 |
| 22423 | | | | | | | | | | | | |
| 22423 | | | | | | | | | | | | |
| 22441 | | | | | | | | | | | | |
| 22423 | | | | | | | | | | | | |
| 22423 | | | | | | | | | | | | |
| 9614 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22423 | 18.0 | 37.6 | 19.6 | 1 | 1 | 175 | 0.11140 | 0.11186 | 0.00046 | 0 | 23.47 | 23.47 |
| 22423 | | | | | | | | | | | | |
| 22423 | 18.2 | 37.3 | 19.1 | 1 | 1 | 176 | 0.11129 | 0.11353 | 0.00224 | 0 | 117.29 | 117.29 |
| 22423 | 18.2 | 37.8 | 19.6 | 1 | 1 | 177 | 0.10679 | 0.10731 | 0.00052 | 0 | 26.53 | 26.53 |
| 22423 | 18.3 | 38.1 | 19.8 | 1 | 1 | 178 | 0.10928 | 0.10960 | 0.00032 | 0 | 16.16 | 16.16 |
| 22423 | 18.1 | 37.6 | 19.5 | 1 | 1 | 179 | 0.11100 | 0.11127 | 0.00027 | 0 | 13.85 | 13.85 |
| 22423 | | | | | | | | | | | | |
| 22423 | | | | | | | | | | | | |
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Stage is measured at staff gage

| FTU | Type | Date | Time | Raw | Stage | Discharge | Vel. Strand | Velocity | Velocity | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| Turbidity | Bott. | | | Stage | | CFS | hi or lo | distance | sec. | |
| 0.97 | h | 08/06/00 | 15:35 | | | | | | | Beith downstream of Golf Course Road |
| 1.62 | h | 09/02/00 | 11:30 | 2" | | | | | | |
| 0.69 | H | 10/19/00 | 17:30 | | 0.26 | | | | | No SSC,Baseline, New Staff gage,GeromesHse |
| 3.56 | h | 10/28/00 | 09:37 | | 0.39 | | | | | |
| 11 | h | 10/30/00 | 07:00 | | 0.5 | | hi | 10' | 9.00 | peak stage 10-29 9pm |
| 56.3 | h | 11/13/00 | 17:45 | | 0.65 | | hi | 10' | 5.50 | rain start 11-13 5am |
| 118 | h | 11/29/00 | 07:17 | | 0.8 | | | | | |
| 63.5 | H | 11/29/00 | 08:40 | | 0.8 | | HI | 10' | 8.50 | Rain start 11-28-00 22:00 |
| 47 | h | 01/08/01 | 11:35 | | 0.67 | | hi | 10 | 5.00 | rain start 1-7-01 19:00 |
| 14.5 | H | 01/25/01 | 09:21 | | 0.6 | | | | | raining |
| 26.3 | h | 02/21/01 | 07:09 | | 0.62 | | | | | |
| 12.9 | H | 03/04/01 | 13:26 | | 0.5 | | | | | Discharge 73" from bridge down to surface |
| 229 | H | 04/06/01 | 17:00 | | 0.73 | | HI | 10' | 4.50 | After steady rain for 1,5 days |
| 6.39 | h | 01/06/01 | 14:40 | | 0.52 | | hi | 10' | 16.72<br>15.61<br>17.37 | Karissa w/ Sunny Brae School Science Project |
| 24.4 | h | 01/08/01 | 15:32 | | 0.95 | | hi | 10' | 15.17<br>15.56<br>12.62 | sunny afterstorm |
| 17.4 | h | 01/09/01 | 16:17 | | 0.86 | | hi | 10' | 14.40<br>16.32<br>18.47 | stormy |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 60.2 | h | 01/10/01 | 15:22 | 1.06 | hi | 10' | 9.04<br>8.12<br>8.02 | overcast after storm |
| 10.3 | h | 01/11/01 | 14:12 | 0.88 | hi | 10' | 12.63<br>12.11<br>10.63 | sunny afterstorm |
| 11.2 | h | 01/14/01 | 16:34 | 0.75 | hi | 10' | 15.25<br>14.28<br>14.82 | sunny & windy |
| 5.68 | h | 01/16/01 | 16:34 | 0.7 | hi | 10' | 11.57<br>16.30<br>9.54 | sunny |
| 7.23 | h | 01/20/01 | 22:16 | 0.65 | hi | 10' | 16.45<br>10.47<br>11.43 | overcast |
| 11.9 | h | 02/24/01 | 12:09 | 0.87 | hi | 10' | 6.98<br>9.77<br>8.28 | foggy |
| 78.1 | h | 01/23/01 | 17:27 | 1.1 | hi | 10' | 9.80<br>11.91<br>12.03 | rainy |
| 15 | h | 01/25/01 | 11:33 | 1.02 | hi | 10' | 8.81<br>8.89<br>9.10 | sunny |
| 13.4 | h | 01/29/01 | 14:05 | 0.94 | hi | 10' | 7.31<br>6.34<br>6.27 | sunny |
| 17.1 | h | 02/09/01 | 11:53 | 0.78 | hi | 10' | 9.33<br>7.28<br>8.57 | foggy & rainy |
| 24.4 | h | 02/21/01 | 16:13 | 0.95 | hi | 10' | 8.83<br>6.58<br>6.76 | rainy & windy |
| 40.1 | h | 02/22/01 | 13:51 | 1.18 | hi | 10' | 7.10<br>6.80 | break in storm |
| 13.4 | H | 03/04/01 | 12:07 | 0.82 | | | | No ssc - took discharge |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 6.58 | h | 08/06/00 | 15:55 | 2" | 0.95 | hi | 4.0' | 3.50 | Beith downstream of Old Arcata Road,staff gag |
| | | | | | | | | 3.60 | |
| | | | | | | | | 3.40 | |
| 7.86 | H | 09/02/00 | 11:15 | | 0.95 | HI | 7 | 2.82 | Beith Dnstrm OAR staff gage - no ssc |
| | | | | | | | | 3.10 | |
| | | | | | | | | 2.51 | |
| 44.5 | h | 02/20/01 | 15:00 | | 0.28 | | | | light rain last 1.5 hours |
| 105 | H | 02/21/01 | 06:21 | 4.5" | | | | | Light rain started 1.75 hours earlier |
| 97.3 | H | 02/21/01 | 07:08 | 3.1" | 0.31 | | | | Overcast no rain in 2 hours |
| 38.1 | H | 02/21/01 | 16:55 | 4" | 0.36 | HI | 10' | 3.48 | Steady rain 44" culvert |
| | | | | | | | | 4.19 | |
| | | | | | | | | 3.13 | |
| | | | | | | LO | 10' | 4.74 | |
| | | | | | | | | 5.12 | |
| | | | | | | | | 4.48 | |
| 48.2 | h | 02/21/01 | 17:30 | 4.5" | 0.45 | | | | steady rain |
| 2.97 | h | 03/01/01 | 19:00 | 0.18' | 0.18 | | | | culvert invert 42.2" no rain,has been steady |
| 12.1 | h | 03/01/01 | 23:00 | | 0.24 | | | | raining steady - culvert invert 41,6" |
| 25.3 | H | 03/02/01 | 01:30 | | 0.3 | | | | Culvert invert 41" heavy rain, start 3/3/01 12:00 |
| 22.1 | H | 03/04/01 | 13:30 | | 0.25 | | | | Culvert invert 41.5" currently light sprinkling |
| 104 | H | 03/04/01 | 18:50 | | 0.56 | | | | Culvert invert 38.4" heavy rain |
| 79.5 | H | 04/02/01 | 11:15 | | 0.45 | | 10' | 5.67 | |
| | | | | | | | | 4.44 | |
| | | | | | | | | 3.62 | |
| 101 | h | 04/02/01 | 11:45 | | 0.26 | | 10' | 6.17 | |
| | | | | | | | | 7.01 | |
| | | | | | | | | 5.54 | |

Petition for listing Beith and Grotzman Creek as 303d

(added information)

Turbidity measurements were complied by trained Salmon Forever volunteers. Margaret Lang, a Humboldt State University environmental engineering professor and head of quality control certified the training for Salmon Forever. Eileen Cashman was also responsible for quality control and volunteer certification. She too is a professor of environmental engineering at Humboldt State. All citizens grab-sampling participants receive this training.