

THE RESOURCES AGENCY OF CALIFORNIA  
Department of Fish and Game

**STREAM SURVEY**

File form No. \_\_\_\_\_ Date: \_\_\_\_\_

**NAME:** Big Sulphur Creek **COUNTY:** Sonoma

**STREAM SECTION:** Entire **FROM:** Mouth **TO:** Headwater **LENGTH:** 21 miles

**TRIBUTARY TO:** Russian River **TWP:** 11 No. **R:** 10 W. **SEC:** 7

**OTHER NAMES:** Unknown **RIVER SYSTEM:** Russian River

**SOURCES OF DATA:** obtained from personal observation and from local residents

<b>EXTENT OF OBSERVATION</b> Include: Name of Surveyor, Date, Etc.
<b>LOCATION</b>
<b>RELATION TO OTHER WATERS</b>
<b>GENERAL DESCRIPTION</b>
Watershed
Immediate Drainage Basin
Altitude (Range)
Gradient
Width
Depth
Flow (Range)
Velocity
Bottom
Spawning Areas
Pools
Shelter
Barriers
Diversions
Temperatures
Food
Aquatic Plants
Winter Conditions
Pollution
Springs
FISHES PRESENT AND SUCCESS
OTHER VERTEBRATES
FISHING INTENSITY
OTHER RECREATIONAL USE
ACCESSIBILITY
OWNERSHIP
POSTED OR OPEN
IMPROVEMENTS
PAST STOCKING
GENERAL ESTIMATE
RECOMMENDED MANAGEMENT
SKETCH MAP
REFERENCES AND MAPS

**EXTENT OF OBSERVATION:** Surveyed on August 6, 7, 8, 9 and 12 [1968] by Seasonal Aides Bruce Thomson and Jim Michaels, by car, with frequent stops for closer observation on foot.

**RELATION TO OTHER WATERS:** Big Sulphur Creek contributes summer and winter flow to the Russian River and provides spawning and nursery area for both steelhead and king salmon. Big Sulphur Creek is one of the larger tributaries to the Russian River System.

**GENERAL DESCRIPTION:** (Watershed and immediate drainage basin). Big Sulphur Creek drains approximately 85 square miles of rugged mountainous terrain to the East side of the Russian River drainage. The stream heads from the Northwest slope of Pine Mountain near the Sonoma-Lake County line and flows about 20 miles in a Northwesterly direction to enter the Russian River about 1 mile Northeast of the town of Cloverdale.

**Immediate Drainage Basin:** The immediate drainage basin is a relatively steep-sided "V"-shaped canyon. The lower 1/2 mile of stream courses across the relatively flat Russian River flood plain. Vegetative cover includes open grassland, dense stands of chaparral interspersed with oak and some conifer on protected slopes and canyons. Riparian cover includes oak, alder and willow. Vegetative cover was generally lacking in the mid-stream area. The streambed is generally wide and flat with extensive deposits of gravel found along most of the mid-canyon and lower stream channels. The Pacific Gas and Electric Company operates an active geothermal steam plant in the upper drainage. Mercury mining operations are also evident in the drainage.

**Altitude:** 350 feet near the confluence with the Russian River and about 3,000 feet in the headwaters.

**Gradient:** About 1 to 2 feet per 100 feet of stream throughout most of the mid and lower drainage. The gradient in the headwater was about 5 to 10 feet per 100 feet of stream.

**Width:** Stream averages about 15 feet wide and ranges from 1/2 to 40 feet. The streambed, including dry gravel bars ranges upward to about 100 feet in width.

**Depth:** Ranges from 1 inch to 15 feet. The average depth of the riffles was about 5 inches, whereas that of the pools was about 3 feet.

**Flow:** A flow estimate made by the float method near the USGS Gauge Station on August 6, was 5.0 c.f.s.

**Velocity:** 25 percent of the stream was considered sluggish, with the remaining portion considered to be rapid.

**Bottom:** Overall composition of streambed materials was estimated: 5 percent bed rock, 30 percent rubble, 40 percent gravel, 15 percent sand and 10 percent silt. The riffles were composed primarily of boulders, rubble and gravel, whereas the bottom of pools was generally sand and silt.

**Spawning Area:** 10 percent of the stream appeared to be suitable for spawning of both steelhead and king salmon. Gravel was generally loose and appeared to lack

large concentrations of fine sand and silt.

Pools: Big Sulphur Creek contains excellent pool development in the ratio of 70-30 pool to ripple area, respectively. Pools average 15 by 45 feet long and 3 feet deep.

Shelter: 9 percent of the pools contain good shelter for fish, consisting primarily of large jagged rocks and undercut banks. Pools in the mid area generally lack shelter.

Barriers: A ten-foot high falls was found one-fourth mile upstream from the PG&E Geothermal Power Plant. Falls were considered to be a complete barrier to migrant salmonids.

Diversions: A ½ H.P. pump was found near the mouth. A temporary dam of about 4 feet high was found about 1 mile upstream from the Russian River. A ten-foot high permanent dam was found about 3 miles upstream from the Geysers Road. This latter pond is used as a duck pond.

Temperatures: Air temperatures recorded at 10 a.m., 12:30 and 2:30 were 78°F, 91°F, and 94°F, respectively. Water temperatures reported at the same time periods were 64°F, 77°F, and 80°F, respectively.

Food: Caddisfly larvae - about 10 larvae per square foot; Mayfly larvae were also observed.

Aquatic Plants: Green algae was found in an abundance throughout most of the stream.

Winter Conditions: High water marks near the mouth indicate a maximum rise of 10 to 15 feet.

Pollution: A 9-mile section of stream located between the PG&E plant at the Geysers and the confluence with Little Sulphur Creek was found to be devoid of fish life. It was also suspected that Thermal Well Exploration and numerous mercury mine operations in the drainage may also contribute to pollution of the stream. A 2-mile section immediately upstream from the Geysers was also found to be devoid of fish.

Springs: There are several steam geysers near the town of Geysers Resort which have been put to work generating electrical energy. A small hot springs is located up-stream from Cobb Creek. Water temperature of other springs was 120° F. There is a Geysers area in the headwater of the Big Sulphur Creek range. This geysers contributes flows in the amount of about 1/10 c.f.s.

FISHES PRESENT AND SUCCESS: Resident trout, steelhead, Sacramento squawfish, roach and suckers. Smallmouth bass were found in the first 1/4 mile of stream and numbered about 50 per 100 feet of stream. Their condition appeared to be good. Size of the smallmouth bass ranged from about 1 to 6 inches and averaged about 4 inches. Juvenile steelhead were found up to the confluence with Little Sulphur Creek. A resident trout population was found upstream from the void area to the headwaters. Juvenile steelhead downstream from Little Sulphur Creek numbered about 25 for 100 feet of stream and ranged in size from 1 to 6 inches, averaging about 2 inches in size. Salmonids found downstream from Little Sulphur Creek showed heavy infestation of copepods. Salmonids found upstream from the void area were in excellent condition. Numbers were about 100 fish per 100 feet of stream. Roach and suckers were dominant fish in all parts of the stream, except the area above the hot springs. Sacramento squawfish were observed only in the first 2 miles of stream. Roach were found in numbers of about 250 fish per 100 feet of stream and averaged about 2 inches in length. Suckers averaged about 6 inches in length and were found in numbers of about 150 fish per 100 feet of stream.

OTHER VERTEBRATES: Garter snakes, frogs and ducks.

FISHING INTENSITY: Unknown

OTHER RECREATIONAL USE: None

Accessibility: Geysers Road follows Big Sulphur Creek up to the Geyser's Resort, a distance of about 16 miles from which a trail follows the Creek up for another 4 miles. A BLM access road into the pine mountain recreation area provides access to the headwater.

PAST STOCKING: Unknown

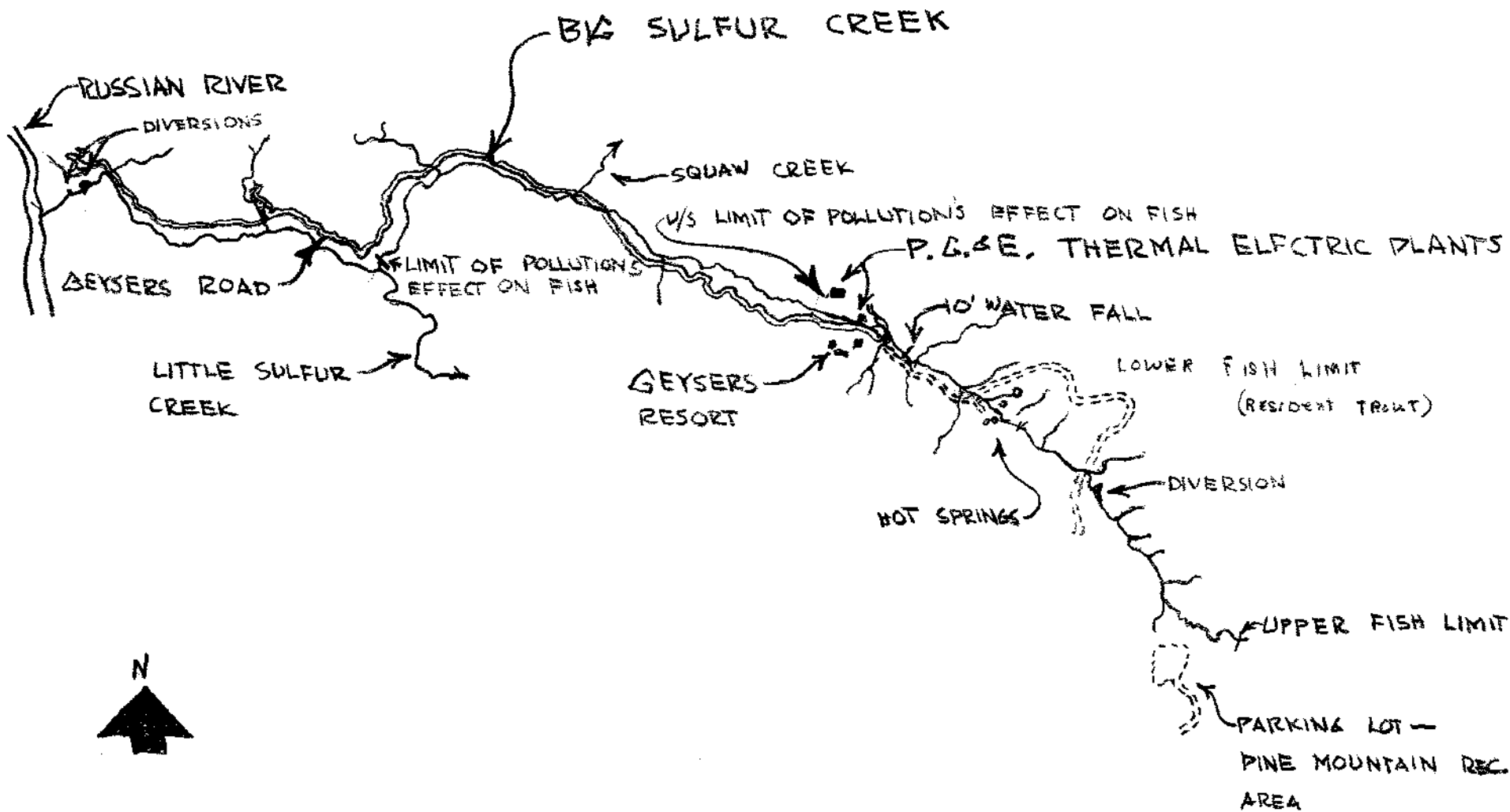
GENERAL ESTIMATE: Big Sulphur Creek is a large and important tributary to the Russian River system. High summer stream temperatures and pollution from thermal steam development near the geysers is believed to limit the salmonid nursery area, in the main stream. The stream contains an abundance of good spawning gravels for both steelhead

and king salmon. Surveys have been compiled for tributary streams and have been filed under the appropriate names.

RECOMMENDED MANAGEMENT: The stream should be managed as a spawning and nursery area for steelhead and king salmon. Control of non-game fish population should be considered. Pollution from the PG&E Plant and the Union Oil Company Thermal Well development should be eliminated. Mercury Mine operations should be periodically checked for their effect upon the fishery resources.

REFERENCE AND MAPS: USGS 15-minute series. Kelseyville quad. and Metsker's map of Sonoma County. Survey by Bruce Thomson.

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11/6/68



# BIG SULFUR CREEK

