STATE OF CALIFORNIA

DEPARTMENT OF FISH AND GAME

INTRAOFFICE CORRESPONDENCE

DATE December 28, 1953

TO: Willis A. Evans, Fisheries Management Supervisor - Region III

FROM: Herbert E. Pintler, Assistant Fisheries Biologist - Region III

SUBJECT: Rough Fish Control Project - Sonoma County Electric Shocking Survey, August 18-28, 1953

The period from August 18 - 28, 1953 was spent in Sonoma County checking fish populations in Sulphur, Dry, Maacama and Sonoma Creeks. The purpose of the project was (1) to learn the benefits of the 1952 chemical treatment in Sulphur Creek, and (2) to determine the feasibility of chemical treatment of the other creeks by learning the present fish populations therein. The objectives are set forth more fully in a letter from Evans to Pintler, dated August 17, 1953.

A small Homelite gasoline motor and generator were used to shock fish in typical pool and riffle areas. The shocked fish were collected, identified, counted and measured. Results are summarized under headings below, followed by appendices giving details.

I. Sulphur Creek

A. Background and Results: Sulphur Creek is located in Sonoma County. It enters the Russian River about a mile east of Cloverdale, California. The drainage extends eastward and is over forty miles in length. The creek was chemically treated with rotenone in August, 1953 following a brief electric shocking survey of the existing fish population (see Tables 21 and 22, Appendix X). The treatment eliminated all fish life up to natural barriers, except in a few tributaries and headwaters where trout were exceptionally abundant. Roach were known to exist above these points. In a typical treated area, 100 percent of the fish population was composed of rough fish.

The object of the present project was, therefore, to check the results of the 1952 chemical treatment. Table 22, Appendix X shows the comparison of fish populations checked in 1952 and 1953, in a pool and riffle area at a point about seven miles upstream from the mouth, and above a falls which is apparently a natural barrier to rough fish. The results showed an increase to 99.3 percent in the trout population and a corresponding drop in rough fish. Although this scarcely seems typical, it is strengthened by warden reports of nearly 100 percent of the anglers catching limits of 5" - 9" trout during the opening weeks of the 1953 season. Appendices I, II and III give details of the 1953 electric shocking sampling in Sulphur Creek.

B. Conclusions:

It is concluded that chemical treatment of Sulphur Creek has definitely cut down the rough fish for the time being. The presence of a natural barrier less than a mile from the mouth undoubtedly played a major role in preventing rough fish from invading the area during the 1952-53 winter high water period. Although the chemical treatment was successful in bringing about an increase in the trout population, it is not known what exact factor is responsible. It appears that the presence of rough fish is detrimental to the development of a good trout fishery. It is still a question of whether the adverse effects of the presence of rough fish is due to predation or to competition. There is also a question as to the desirability of eliminating the entire rough fish population, since the existence of particular species or population levels of a species might provide food for the larger trout and act as a food buffer between the large trout and the fingerlings.

C. Recommendations:

1. That the area below the barrier falls be chemically treated in the fall of 1953 in order to cut down the number of rough fish which might conceivably surmount the barrier at high water.

2. That the falls be checked frequently to note any change in the slide area which would tend to diminish the barrier.

3. That a recheck of the drainage by electric shocking be made in August, 1954 to determine how sustained the effects is of the rough fish control.

4. That a check of fishing success at the opening of the 1954 trout season, preferably by wardens be made to learn in which direction it is going.

II. Dry Creek

A. Background and Results: Dry Creek is a tributary to the Russian River about two miles south of Healdsburg, Sonoma County. It arises just north of the Sonoma-Mendocino County line and consists, with tributaries, of about 140 miles of stream. In November 1952, a section of about ten miles from the dried-up section near the mouth, upstream, was chemically treated to observe the effects of partial treatment. Approximately 90 percent of the fish killed in the treated area were rough fish, the remainder being rainbow trout steelhead.

The objective of the 1953 electric shocking survey on Dry Creek was to determine the feasibility of complete treatment of the

APPENDIX I

Data Obtained from Pool and Riffle Area No. 1,
Sulphur Creek, Sonoma County by Electric Shocking

Date: August 19, 1953

Location: T. 11 N., R. 8 W., Sec. 19, MDB&M, just above the Geysers Resort.

Area and Pool Description: Area is located in a narrow canyon with a moderately steep gradient. Surrounding countryside is high and covered with an oak-grass association. Fumaroles are present in the immediate area. The rocky banks show a white to pink sulphurous deposit tasting like alum. About half the area is well shaded. Area is about 15' x 50' with a maximum depth of 5 feet. Bottom is mostly bedrock covered with a little gravel and in some spots a red sediment. Aquatic plants are almost absent.

Participants: Messrs. Wm. Irish and Ben Howe, Sonoma County Fish Rescue Crew; H. Pintler and T. Merkel, Inland Fisheries Branch; Warden Harley Groves, Wildlife Protection Branch.

Physical Measurements: Air temperatures 83°F. at 3 P.M.; Water temperatures 75°F. at 3 P.M.; Flow: approximately 2 c.f.s. estimated.

Status of Area: Shocked but not treated with rotenone in 1952.

Fish Collected: See following tables, a recap of which is shown immediately below.

Species	Number	Percent of Population	Size
Rainbow Trout - Steelhead	31	5.3	1.6" to 4.0"
Western Sucker	4	0.7	1.4" to 8.8"
Western Roach	544	94.0	0.9" to 4.2"
Pacific Lamprey	3	-	20.8" to 22.9"
Total	582	100.0	

APPENDIX II

Data Obtained from Pool and Riffle Area No. 2, Sulphur Creek, Sonoma County by Electric Shocking

Date: August 18, 1953

Location: T. 11 N., R. 9 W., Sec. 4, MDB&M, about 75 yards below the mouth of Squaw Creek.

Area and Pool Description: Area is located in a narrow canyon and has characteristics quite similar to Area No. 1, except that it is almost completely shaded and is downstream beyond the vicinity of the fumaroles. The area is about 18' x 70' with a maximum depth of 6 feet.

Participants: Warden and Mrs. Harley Groves, Messrs. Wm. Irish and Ben Howe, Sonoma County Fish Rescue Crew, H. Pintler and T. Merkel, Inland Fisheries Branch.

Physical Measurements: Air temperature; 86°F. at 2:15 p.m.; Water temperature 78°F. at 2:15 p.m. Flow: approximately 3 c.f.s. estimated.

Status of Area: Treated with rotenone and shocked in 1952.

Fish Collected: See following table, a recap of which is shown immediately below.

Species	Number	Percent of Population	Size
Rainbow Trout - Steelhead	3393	99.3	5.8" per ounce
Western Sucker	23	0.7	1.7" to 4.2"
Pacific Lamprey Ammocoetes	3	-	1.9" to 5.9"
Total	3419	100.0	

There were several hundred fish under an inch in length left in the pool. Those examined appeared to be the Western Roach.

APPENDIX III

Data Obtained from Pool and Riffle Area No. 3, Sulphur Creek, Sonoma County by Electric Shocking

Date: August 20, 1953

Location: T. 11 N., R. 10 W., Sec. [5] MDB&M, just above the old powerhouse opposite Leubold's ranch and about 0.7 miles below the lowermost falls.

Area and Pool Description: Canyon is wide with low banks at this point, the stream channel being flat, open and shallow. There is no shade. Willows line the banks but the nearby hills are open grasslands and vineyards with some oaks. The stream bottom here is mainly gravel with a few large boulders and out-croppings of bedrock. The area is about 40' x 80' with a maximum depth of 4 feet.

Participants: Messrs. Wm. Irish and Ben Howe, Sonoma County Fish rescue Crew, H. Pintler and T. Merkel, Inland Fisheries Branch.

Physical Measurements: Air temperature: 80°F. at 9 a.m.; Water temperature, 78°F. at 9 a.m.; Flow: approximately 3 c.f.s. estimated.

Status of Area: Treated with rotenone but not shocked in 1952.

Fish Collected: See following tables, a recap of which is shown immediately below.

Species	Number	Percent of Population	Size
Rainbow Trout - Steelhead	27	5.5	2.6" to 5.9"
Western Sucker	40	8.2	1.1" to 6.4"
Sacramento Squawfish	379	77.7	1.2" to 7.4"
Splittail	1	0.2	3.7"
Western Roach	34	7.0	Up to 3.3"
Tule Perch	7	1.4	2.7" to 4.0"
Total	488	100.0	

In addition 20 Pacific Lamprey ammocoetes from 2.2" to 5.2" were taken.

Table 24

A Comparison of Fish Populations Sampled by Various Means in Selected Areas of Sulphur, Dry, Maacama and Sonoma Creeks, Sonoma County in 1952 and 1953

SPECIES	S U L P H U R C R E E K									
	Area No. 1 Net Treated in 1952				Area No. 2 Treated in 1952				Area No. 3* Treated in 1952	
	1952 Shocking		1953 Shocking		1952 Spot Treatment		1953 Shocking		1953 Shocking	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Rainbow Trout-Steelhead	35	8.9	31	5.3	0	-	3393	99.3	27	5.5
Western Sucker	9	2.3	4	0.7	134	58.0	23	0.7	40	8.2
Carp										
Hardhead										
Sacramento Squawfish					97	42.0	0	-	379	77.7
Splittail									1	0.2
Western Reach	35	88.8	544	94.0					34	7.0
Green Sunfish										
Tule Perch									7	1.4
Cottid (sp.?)										
Stickleback										
Total	395	100.0	579	100.0	231	100.0	3416	100.0	488	100.0

* Below barrier falls.