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MS

STATE WATER RESOURCES CONTROL BOARD

STATE OF CALIFORNIA

IN THE MATTER OF CITY OF LOS ANGELES WATER RIGHT LICENSES 10191 AND 10192 FOR DIVERSION OF WATER FROM STREAMS TRIBUTARY TO MONO LAKE	**CALIFORNIA TROUT'S EXHIBITS (VOL. 2 OF 2)**

September 22, 1993

Submitted by:

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NATURAL HERITAGE INSTITUTE

Counsel for California Trout, Inc.

EXHIBIT IDENTIFICATION INDEX
HEARING REGARDING AMENDMENT OF THE CITY OF LOS ANGELES WATER RIGHT LICENSES FOR DIVERSION OF WATER FROM STREAMS THAT ARE TRIBUTARY TO MONO LAKE

Participant: California Trout, Inc.

Exhibit Number	Description	Status as Evidence	
		Introduced	Accepted
CT-1	Testimony of Jean E. Baldrige		
CT-1A	Statement of Qualifications of Jean E. Baldridge		
CT-2	Testimony of Larry Dale		
CT-2A	Statement of Qualifications of Larry Dale		
CT-2B	W. Michael Hanneman, "Marginal Cost Pricing and the New LADWP Water Rates"		
CT-3	Testimony of David Fullerton		
CT-3A	Statement of Qualifications of David Fullerton		
CT-3B	"Memorandum of Understanding Regarding Urban Water Conservation in California" (Sept. 1991)		
CT-3C	"Assumptions and Methodology for Determining Estimates of Reliable Savings from the Installation of ULF Toilets" (June 30, 1992)		
CT-3D	Western Utility Consortium, "Program Outline for Multi-Utility Clothes Washer Incentive Eligibility Standards" (August 15, 1993)		
CT-4	Testimony of Carl F. Mesick		
CT-4A	Statement of Qualifications of Carl F. Mesick		

Exhibit Number	Description	Status as Evidence	
		Introduced	Accepted
CT-4B	Trihey & Associates, "A Proposed Plan for the Monitoring of Fish Populations in Rush and Lee Vining Creeks, Mono County, California," inc. cover letter from Jean Baldrige to Mark Hill (July 28, 1992)		
CT-5	Testimony of Elden Vestal		
CT-5A	Statement of Qualifications of Elden Vestal		
CT-5B	Excerpts of Elden Vestal's Weekly and Monthly Reports (1939-1950)		
CT-5C	Recreation Map of Mono Basin (1938)		
CT-5D	Photo of Lee Vining Creek (1916)		
CT-5E	Mono Lake Tributary Streams Chart by Vestal (Feb. 5, 1990)		
CT-5F	Excerpts from 29th Biennial Report of Fish & Game Commission (1924-1926)		
CT-5G	Excerpts from 30th Biennial Report of Fish & Game Commission (1926-1928)		
CT-5H	Photo of Rush Creek at L.A. Venturi Weir (1940)		
CT-5I	Photo of Rush Creek egg-collecting station (Oct. 16, 1939)		
CT-5J	Photo of cutthroat throat (1940)		
CT-5K	Photo of Rush Creek below Gorge (Feb. 21, 1947)		
CT-5L	Photo of brown trout (Oct. 16, 1939)		
CT-5M	Photo of Rush Creek (Feb. 21, 1947)		
CT-5N	Field notes of Elden Vestal (Jan. 21, 1947)		
CT-5O	Photo of Rush Creek at fish trap and weir (April 10, 1947)		
CT-5P	Photo of angler on Rush Creek (May 2, 1948)		
CT-5Q	37th Biennial Report of Fish & Game Commission (1940-42)		
CT-5R	Photo of anglers on Rush Creek (Nov. 2, 1948)		

Exhibit Number	Description	Status as Evidence	
		Introduced	Accepted
CT-5S	Elden Vestal, "Creel Returns from Rush Creek Test Stream, Mono County, California," 40 Cal. Fish and Game Reports 89-104 (1954)		
CT-5T	Photo of Rush Creek (1986)		
CT-6	Testimony of Peter Vorster		
CT-6A	Statement of Qualifications of Peter Vorster		
CT-7	El Dorado Superior Court, "Agreement on Parker and Walker Creek Modification" (filed Aug. 1, 1990) (public document submitted by reference)		
CT-8	El Dorado Superior Court, "Agreement on Rush and Lee Vining Creeks' Restoration Program" (filed Nov. 2, 1990) (public document submitted by reference)		
CT-9	Trihey & Associates, Comparison of Historic and Existing Conditions on Lower Lee Vining Creek, Mono County, California (Jan. 1992) (public document submitted by reference)		
CT-10	Trihey & Associates, A Conceptual Plan for the Restoration of Aquatic and Riparian Habitats in Rush and Lee Vining Creeks, Mono County, California (2nd draft May 1991) (public document submitted by reference).		
CT-11	Trihey & Associates, Description and Evaluation of Restoration Alternatives for Lower Lee Vining Creek, Mono County, California (Jan. 1992) (public document submitted by reference)		
CT-12	Trihey & Associates, Overview of 1992 Restoration Treatments (Feb. 1993) (public document submitted by reference)		
CT-13	Trihey & Associates, Past and Present Geomorphic, Hydrologic, and Vegetative Conditions on Rush Creek (Sept. 1992) (public document submitted by reference)		
CT-14	Trihey & Associates, Rush & Lee Vining Creeks: 1991 Restoration Work (Oct. 25, 1991) (public document submitted by reference)		

Exhibit Number	Description	Status as Evidence	
		Introduced	Accepted
CT-15	Trihey & Associates, Summary Comparison of Pre-1941 and Post-1941 Conditions affecting Fish Populations in Lower Rush Creek, Mono County, California (Sept. 1993) (public document submitted by reference)		
DFG-15	Testimony of Thomas R. Payne, including all exhibits referenced in DFG-15 (submitted by DFG)		
NAS&MLC-1W	Testimony of Dr. Scott Stine re fishery, including all exhibits referenced in NAS&MLC-1W (submitted by NAS&MLC)		
NAS&MLC-1Y	Testimony of E. Woody Trihey re stream restoration, including all exhibits referenced in NAS&MLC-1Y (submitted by NAS&MLC)		
NAS&MLC-1X	Testimony of E. Woody Trihey re streamflow recommendations, including all exhibits referenced in NAS&MLC-1X (submitted by NAS&MLC)		

STATE WATER RESOURCES CONTROL BOARD

STATE OF CALIFORNIA

IN THE MATTER OF CITY OF LOS ANGELES WATER RIGHT LICENSES 10191 AND 10192 FOR DIVERSION OF WATER FROM STREAMS TRIBUTARY TO MONO LAKE	**CALIFORNIA TROUT EXHIBIT 5 (CT-5)**

TESTIMONY OF ELDEN VESTEL

I, Elden Vestal, hereby declare:

INTRODUCTION

1. I submit this declaration on behalf of California Trout, the Mono Lake Committee, the National Audubon Society, and the California Department of Fish and Game (DFG). I have personal knowledge of all matters herein, and if called as a witness before the Board would be competent to testify thereto.

2. I served as a State Fisheries Biologist in the Mono Basin 1939-1950. I was personally familiar with the conditions of the fisheries, and fish habitat conditions which prevailed in the Basin, during that period. In addition, my official capacity required that I be familiar with State reports regarding historic fisheries, and habitat conditions, in the Mono Basin prior to 1938, extending back to the late nineteenth century. I am confident that my personal recollections of the Mono Basin, supplemented by my contemporaneous photos and notes, as well as prior documentation, accurately reflect historic fishery conditions. Attached hereto as exhibit CT-5A is a true and

correct copy of my resume setting forth my qualifications and work history.

EXPERT QUALIFICATIONS

3. I am a Fisheries Biologist. My academic qualifications relevant to this title consist of a Masters Degree in Zoology obtained in 1936 and graduate work which I performed in Zoology in 1937. Prior to that, I had obtained a Bachelor of Arts Degree in Letters and Science in 1934 and a General Secondary Teacher's Credential in 1935.

4. I have personal knowledge of the conditions that existed in Rush, Lee Vining, Parker and Walker Creeks, including their fisheries, from 1939 to 1942 and from 1946 to 1950. This knowledge is based primarily upon the work I did for the Department of Fish and Game in the Inyo-Mono Region from 1939 to 1950. I also have some knowledge of these tributaries to Mono Lake based upon my personal experience as a fisherman and information I obtained from briefings and liaisons with wardens, hatchery personnel, Forest Service personnel, anglers and old-timers in the district. I considered all of these people to be reliable sources of information. I was also familiar with the historic conditions prevailing in these tributaries prior to my arrival in the Basin, 1880-1938, due to my review of State records and documents and information relayed to me about the area by old timers in the area.

5. I worked for the California Department of Fish and Game (originally the California Division of Fish and Game) in various capacities from 1938 to 1978. I began work in 1938 as an Inland Water Fisheries Researcher and thereafter worked in positions of increasing responsibility as a District Fisheries Biologist.

6. My work in connection with the tributaries to Mono Lake began in 1939 when I became District Biologist in charge of fisheries investigations and management in the Inyo-Mono Region of California. I continued working in the Inyo-Mono Region in various Fisheries Biologist positions from 1940 to 1950, with the exception of a leave from December 1942 to March 1946 when I served in the military.

7. My work involving the tributaries to Mono Lake ended in 1950 when I became District Fisheries Biologist with supervisory responsibility for San Joaquin-Sierra Region 4, Fresno. From 1953 to 1966, I worked as Fisheries Biologist III with continued supervisory responsibility in Region 4. From 1966 to 1979, I worked as Fisheries Management Supervisor for Central Coastal Region 3.

8. In my position as District Biologist for the Inyo-Mono Region, from May 1939 to June 1940, I organized and conducted an inventory of all waters in the Inyo-Mono Region, including Rush, Lee Vining, Parker and Walker Creeks. In my Fisheries Biologist positions from 1940 to 1950, I supervised all fisheries investigations and management in the Inyo-Mono Region. From 1946

to 1950, I also planned and supervised a Rush Creek Test Stream study.

9. My work from 1939 to 1942 involved regular visits to Rush and Lee Vining Creeks and occasional visits to parts of Walker and Parker Creeks. I continued to visit Rush Creek regularly and Lee Vining Creek occasionally in connection with my work from 1946 to 1950, and I visited Parker Creek in connection with a 1946 survey of Parker Lake.

10. I made brief notes of my daily and monthly activities from 1939 to 1950 in Weekly and Monthly Reports required by the Department of Fish and Game. Many of my visits to the Mono Lake tributaries are reflected in these notes. A true and correct copy of excerpted portions of these reports is attached hereto as exhibit CT-5B. I did not record every occasion when I examined a portion of the Mono Lake tributaries in my Weekly and Monthly Reports.

11. I made some visits to the Mono Lake tributaries on route to other locations or in conjunction with other activities. For example, I visited Lee Vining Creek when travelling back and forth to the District Ranger's office located on Lee Vining Creek. I also visited Parker and Walker Creeks in conjunction with visits to Rush Creek because these are tributaries to Rush Creek and have an impact on Rush Creek conditions. I also made brief visits to the Mono Lake tributaries to investigate matters such as reports of stranded fish. Finally, I routinely inspected

the Mono Lake tributaries on opening days and on other "pressure point" days such as Memorial Day to assess the amount, distribution and results of angling activity.

12. My Weekly and Monthly Reports reflect a number of visits to the "L.A. Venturi Weir." This weir is on Rush Creek and contained a Parshall Flume, which was installed by DWP to measure flows in Rush Creek. It also constituted a barrier to fish migration along Rush Creek at high flows. My visits to the L.A. Venturi Weir, therefore, involved an assessment of conditions on Rush Creek.

13. In addition to my work activities, I visited portions of Rush Creek several times in the spring and fall, from 1939 to 1941, to do spot fishing. I also fished occasionally on Lee Vining Creek.

14. During my reconnaissance, inspection and other visits to the Mono Lake tributaries, I commonly evaluated stream temperatures and flows, effects of diversions on the streams, fish catches (including the size, species and condition of the fish), amount and type of angling activities, numbers of visible fish, stranded fish reports, pollution reports, barriers to fish migration and other such matters pertinent to my work. On Rush Creek, I also examined the state of the egg-collecting station on a regular basis in the spring and fall.

15. In addition to personal visits, while I worked in the Mono Lake area, I obtained information from wardens, hatcherymen,

Forest Service personnel, anglers and old-timers concerning stream conditions, angling activity, fish catches, fishery conditions and other such matters pertaining to the Mono Lake tributaries. When travelling, I frequently stopped to talk to wardens who were part of the Fish and Game team in the Mono Lake area in order to obtain such information. I also stopped to talk to anglers and made telephone calls to anglers I had met previously to inquire about their angling activities and success. I was also in regular contact with several hatcherymen familiar with conditions in the Mono Lake tributaries.

HISTORIC FISH POPULATIONS; LATE 19TH CENTURY - 1940s

Overview of Mono Tributaries as Productive Fisheries

16. Rush Creek undoubtedly supported thriving, healthy trout populations from the time trout were first introduced into the system from about 1880 through the mid-1940s. In my experience, cutthroats (also referred to as black-spotted), rainbow and brown trout all flourished in Rush Creek, and lower Rush in particular, over this period of time. The Rush Creek egg collecting station produced millions of trout eggs annually and served as a prime source of trout throughout the Eastern Sierra, and even the rest of California.

17. I attribute the unusual productivity of Rush Creek to a fortuitous blend of factors. The level of flow, the channel and the habitat complexity of lower Rush Creek combined to make it a

fishing paradise, more than deserving of its reputation as an excellent trout stream, among the best in the Eastern Sierra. Rush Creek ranked close to Hot Creek in terms of the numbers and size of trout produced. Rush Creek Ranch, located on lower Rush Creek, featured the fine fishing for many years. Attached hereto as exhibit CT- 5C is a true and correct copy of a tourist map of the area from the 1930s labelling the area a "fishermen's paradise" and providing references to fishing locations and suppliers in the Mono Basin.

18. Lee Vining Creek also supported excellent trout fisheries during this historical period. Trout populations in Lee Vining may not have been as high as those in Rush Creek, but it was without question a fine trout stream. Again, this was due in part to the excellent trout habitat provided by the Creek. People in Lee Vining considered this reach to afford the best trout fishing in the canyon. The historic conditions of Lee Vining Creek are clearly represented in a photograph of the Creek taken by Joe Dixon in 1916 from the mouth of the stream above where it enters into Mono Lake. A true and correct copy of this photograph is attached hereto as exhibit CT-5D. In my opinion, this 1916 photo depicts the conditions in Lee Vining as I experienced them from 1939 to 1942. The photo shows a rapid trout stream with abundant whitewater, short pools, pocketed and extended gravels, rubble, some boulders and dense riparian cover.

19. Attached hereto as exhibit CT-5E is a true and correct copy of a chart that I prepared reflecting data that I collected on all of the Mono Lake tributaries, dated February 5, 1990. The chart is based upon my early field notes, weekly and monthly logs, photographs and other accumulated materials.

Rush Creek Fish Production

20. I will now address quality of the historic fisheries in the Mono Basin in greater detail. As indicated above, I am very familiar with Rush Creek fish population due in part to my experience in the Basin and the test stream study, and in part to my experience with the state's fishery planting data for the region. Trout are not native to the Eastern Sierra, but easily colonized many of these streams once they were introduced. The Eastern Sierra streams are widely recognized for their good fishery habitat.

21. The first trout were probably introduced into Rush Creek in about 1880. Old timers in Lee Vining and the Mono Lake area told me that cutthroat trout were present in lower Rush Creek by the turn of the century. These were most likely imported from the nearby East Walker River Basin. Black-spotted cutthroats rapidly dominated the Rush Creek system. Brown trout were introduced into Rush Creek in about 1917. Browns tend to be a hardier trout species, and eventually supplanted the cutthroats. Nevertheless, the cutthroats in Rush Creek in the early years (1880-1930s) were so dense and so vigorous, that they

propagated in great numbers in the Rush Creek system for many years.

22. Prior to the City of Los Angeles' expansion of Grant Lake dam in the early 1940s, the upper and lower Rush Creek were part of a comprehensive fish production system. I am certain that the cutthroat which populated lower Rush Creek in large numbers after being planted in the 1880s were able to migrate beyond Grant Lake. Cutthroats spawned in the lower portion of Rush Creek totally colonized the system and migrated throughout. As a result, Gull, Silver and Grant Lakes were populated with cutthroats from the Rush Creek system. When I visited the L.A. Venturi Weir, I sometimes saw cutthroats and other fish migrating upstream despite the barrier that this presented. Attached hereto as exhibit CT-5F is a true and correct copy of Rush Creek at the L.A. Venturi Weir showing typical conditions at that location.

23. An egg collecting station was established on upper Rush Creek in 1923 owing to the productivity of the Creek's trout fishery. Fish eggs were collected from this station and distributed to other less productive streams throughout the Eastern Sierra. Attached hereto as exhibit CT-5G is a true and correct copy of a photograph of the egg-collecting station which I took on October 16, 1939. The photo clearly shows the richness of the Rush Creek habitat at that time.

24. In addition, a decision was made in 1925 to establish a hatchery on an upper tributary of Rush Creek in order to take advantage of the superior breeding and nursery habitat. The hatchery was built the following year. At that time, hatcheries were located in excellent fish breeding areas in order to collect wild fish eggs to rear fish for distribution to other less fortunate streams.

25. My recollections concerning the abundance of fish in Rush Creek are supplemented by contemporaneous fishery data from the period. For example, the 29th Biennial Report of the California Fish and Game Commission, for the years 1924-1926, stated that the take of these black-spotted trout eggs was:

> "very gratifying" because "black spotted trout of this region have an excellent lot of eggs that produce vigorous embryos and develop into strong healthy fish." Report at 55.

26. The same Report stated that the take of black-spotted trout eggs from Rush Creek and its tributaries exceeded 1.0 million in 1925. DFG planted 727,500 eggs from this station that year. The FGC stated at that time:

> It was a common sight to see 20-30 boats on June Lake during fishing season and all parties catching fish. The native trout of the Lake were the black spotted trout that would ascend to Rush Creek during heavy rains and snows. Report at 55.

A true and correct copy of the relevant pages of this Report is attached hereto as CT-5H. Thus, the viability of the trout

fishery was clearly recognized, and even celebrated, in the pre-diversion period.

27. Records from later CFG Biennial reports confirm the continued productivity of Rush Creek. For example, the 30th Biennial Report, 1926-1928, stated that the Rush Creek egg collecting station furnished:

> [A]n average of 2.0 million eggs per season [since established in 1925]. Despite many persons fishing in Grant Lake, the black spotted trout appear to be increasing. The take of eggs from Rush Creek Station during spring of 1928 was 3.0 million." Report at 47.

A true and correct copy of the relevant pages of the 30th Biennial Report is attached hereto as exhibit CT-5I. In my opinion, this extraordinary level of production is clear evidence that Rush Creek supported a major trout fishery.

28. Brown trout began to dominate the Rush Creek system in the mid-1930s. This occurred for two reasons. First, DFG began planting browns in the system in response to local angling pressure for this species. Second, the cutthroat population was diminished by the intense level of angling in the region. As early as the 1930s, brown trout were producing excellent fishing in lower Rush Creek.

Quality of Rush Creek Fish

29. There is no doubt that Rush Creek produced among the largest and hardiest trout in the region, in keeping with the statement in the FGC report, cited above, regarding the potency of Rush Creek fish eggs. I took a number of photographs during

my tenure in the region which attest to the very high quality of the fish produced by Rush Creek. Attached hereto as exhibit CT-5J is a true and correct copy of a photograph of a cutthroat which I took at Upper Blue Lake on June 24, 1940, representing the typical size and condition of the cutthroats I saw in Rush Creek from 1939 to 1942.

30. In my own experience, I recall that Rush Creek fishing was particularly spectacular below the Gorge. Attached hereto as exhibit CT-5K is a true and correct copy of a photo I took of this section of Rush Creek on February 21, 1947 showing wonderful gravels, riparian cover of dense willows and cottonwoods and a good fishing area. In the late 1930s, people were catching predominantly brown trout in lower Rush, although I knew of people who caught rainbows and the very rare Eastern brook trout. I personally observed all three species in this area at that time. Without exception, the trout caught on lower Rush were in good condition. I never saw, and never heard of, anyone catching fish on Rush Creek which were of poor quality.

31. Part of the attraction of lower Rush Creek as an angling mecca (see below) stemmed from its reputation as an area for catching large trout. I regularly observed brown trout in lower Rush Creek averaging 13 - 14 inches in length, and people often spoke of catching even larger fish, up to 18-20 inches. Attached hereto as exhibit CT-5L is a true and correct copy of a photograph of an 18 inch brown trout which I saw at the Rush

Creek egg-collecting station on October 16, 1939. This photograph represents the typical size and condition of the adult spawning brown trout I observed in Rush Creek at that time.

Rush Creek Habitat

32. The quality of the Rush Creek habitat in the historical period was clearly the most important factor in the superior quality of the fishery. The lower section, given natural flow levels, was a very rich area for trout food production, and contained excellent trout habitat in terms of riparian cover and gravels. The reach from the narrows to the Lake, the delta area, in particular provided this type of important habitat not only in terms of food production, but also channel refuge and cover. The excellent quality of the delta area is illustated by exhibit CT-5M. Attached hereto as exhibit CT-5M is a true and correct copy of a photograph that I took of Rush Creek on February 21, 1947, as it enters the delta of Mono Lake, during a time of relatively high water flow (170 c.f.s.).

33. During the historical period, flow levels in Rush Creek normally reached a spring run of a maximum of about 175 c.f.s.. This flow level would increase to 300 c.f.s. in wet years. Parker and Walker streams contributed about 50 c.f.s. to this flow, the rest coming from the Grant Lake runoff.

34. Attached hereto as exhibit CT-5N is a true and correct copy of field notes (with an attached typewritten translation) that I took on the same day, describing the conditions on Rush

Creek. I particularly noted the excellent gravels, riparian cover and accessibility for fishing in various locations.

35. The springs and watercress beds contributed importantly to the production of more than a dozen kinds of stream bottom foods, as shown by occasional check of large gravel and rubble, as well as trout stomachs. The springs in the meadows area in particular provided this type of significant habitat. Attached as exhibit CT-50 is a true and correct copy of a photograph I took on April 10, 1947 showing Rush Creek as it moved downstream from the meadows and into the delta area. This photograph contains a weir and fish trap and shows very good fish habitat, before the L.A. diversions had a serious impact on the area.

36. Attached hereto as CT-5P is a photograph I took of an angler fishing on Rush Creek as it existed in 1947, with dense riparian cover, beautiful gravels and a nice flow of approximately 20 c.f.s.. This photograph is representative of the conditions on Rush Creek before L.A.'s diversions began to have a serious impact.

37. As I recall, Parker and Walker Creeks were continuous streams in their natural condition, especially in the wetter years. They contributed important nursery and breeding areas for Rush Creek, as well as food production for trout, particularly in the lower reaches. Parker and Walker also supported their own fisheries.

Rush Creek Angling

38. The quality of Rush Creek as a historic trout stream is evident not only in the fish population records, but in its extraordinary popularity as a fishing area during the 1920s-1940s. To a large extent, Fish and Game Commission policies regarding fishery management in the Mono region were driven by the intense popularity of the region as a fishing mecca.

39. Once again, contemporaneous records from that period illustrate this point. The 29th Biennial FGC Report states that the Division decided to establish the Rush Creek hatchery "to supply this now famous fishing region where thousands of persons form southern California and other places spend their vacations." 29th report at 56. (See Exhibit 5-G) Mono County ranked number one in the entire State for fishing and yield from planted rainbow and naturally propagated brown trout. Attached hereto as Exhibit CT-5Q is a true and correct copy pages from the 37th Biennial Report of the Fish & Game Commission, containing a Table showing Mono County's ranking for trout catch.

40. This record is entirely consistent with my own observations. As indicated above, I enjoyed fishing in the region during my time there, and I saw considerable evidence of the area's fishing popularity. Angling on Rush Creek during the period I was working in the Basin averaged 10 anglers per mile or 35 anglers a day. This is a very high level of fishing intensity for a stream of this size. Attached hereto as exhibit CT-5R is a

true and correct copy of a photograph I took on May 2, 1948 showing numerous anglers on a stretch of Rush Creek, before L.A.'s water diversions had seriously degraded fishing conditions.

41. In addition to personal observations, I received reports concerning the abundance of fish and the popularity of angling on the Mono Lake tributaries from local wardens and sportsmen. I was also aware that the area was often advertised with special emphasis on the wonderful fishing opportunities.

42. Fishing on these streams was so productive that for many years (up through the 1940s), it supported a major resort community prior to the impact of LA's major diversions out of the Basin. While I cannot quantify the economic impact of the pre-diversion fisheries, I am confident in saying that the Mono tributary streams supported a large commercial enterprise that could not have existed in the absence of excellent fishing.

Lee Vining Fishery

43. Lee Vining was also considered to be an excellent trout stream. I recall that fish caught on Lee Vining may have been somewhat smaller than those on Rush, closer to the 8-10 inch range on average. The section of Lee Vining from the Ranger Station to the mouth was one of the best fishing sections in the canyon. My statement in this regard is based on reports from local wardens and local fishermen such as Bill Banta, Gus Hess and others with whom I was in close communication.

44. I inferred from these reports that portions of Lee Vining were comparable to Rush Creek. Warden reports were prepared to make fish planting recommendations and to ensure maintenance of a normal prediversion population, meaning maintenance of normal habitat conditions throughout all seasons and life cycle stages.

45. In my judgment, as indicated above, the conditions reflected in the 1916 photo of Lee Vining Creek were just about the same as those which existed in 1940; dense riparian cover, alders, willows, short pools and pocketed to extensive gravels. In 1940 the riparian corridor was just about the same.

Impact of Irrigation Diversions

46. The irrigation diversions affected Walker and Parker primarily, while trout angling took place far downstream on lower Rush and in the reach from above the old highway 395 bridge to the Bend below Grant Lake dam. Rush Creek was not as substantially affected due to return flows and springs. Portions of Rush Creek would be intermittently dry in the fall as the result of irrigation, but not sufficiently to cause major damage to the trout fisheries.

47. Rush Creek went dry or nearly so in the reach from just above the Old 395 Bridge up to the mouths of Parker and Walker Creeks when major diversions occurred to sheep range in summer. Losses of trout occurred at this time due to stranding, although some trout were able to migrate upstream or downstream from the

main stem reach affected. The trout fishery survived and repopulated the dry portions of Rush Creek when flows were restored.

48. I do not recall any significant irrigation diversions from Lee Vining Creek. I do not recall Lee Vining Creek going dry in the same manner as Rush Creek.

HISTORIC FISH POPULATIONS; 1940s - Early 1950s

49. After World War II, I returned to the Mono Basin in my capacity as a District Fisheries Biologist. The angling pressure, which had always been intense in this region, had become even more severe. DFG policy, which had always been geared to satisfaction of the fishing public, moved toward producing more and even larger fish. Toward this end, I was placed in charge of a major experiment to determine how the Commission could enhance fish catches. This would turn out to be the most extensive study of the Rush Creek fishery ever conducted. A true and correct copy of my report is attached hereto as exhibit CT-5S.

50. Rush Creek was ideal for this experiment because it was typical of heavily fished trout streams of the Eastern Sierra, it was near highway 395, and access for planting and fishing could be controlled. Coincidentally, it was in 1947 that LA began diverting major amounts of water out of the Mono Basin. With the onset of major diversions, ecologic constriction of Rush Creek, Parker

Creek, Walker Creek and Lee Vining Creek occurred with increasing severity.

51. From 1947 on, no water was released into Rush Creek from Grant Lake dam during the entire trout season. As a result, the test stream at the upstream barrier was completely dry by late August in 1948 and by mid-July in 1949. The entire summer flow was supplied by the springs below the Rush Creek Test Stream barrier. The springs declined steadily; and the minimum flow in the best stream fell from 24 c.f.s. in 1947 to 12 c.f.s. in 1948, 13 c.f.s. in 1949, and 2 c.f.s. in 1950 and 1951. Mean flow during the 1951 season was only 2.5 c.f.s..

52. Except for required irrigation releases, similar ecologic constriction occurred in Parker, Walker and Lee Vining Creeks. By the end of 1951, severe encroachment by riparian cover had occurred in Rush Creek and instream habitat improvements were attempted to preserve a semblance of the once famed trout stream. The tributaries were reduced to minimum survival conditions for fish.

53. I did not assess the conditions of the Mono Lake tributaries from the time that I stopped working in the area in 1951 until I visited Rush Creek in 1986. When I returned in 1986, I was shocked by the devastation of the stream that had occurred since I worked in the Mono Basin. The stark contrast between the conditions of the stream as I knew it from 1939 to 1947 and the conditions existing in 1986 is dramatic. Attached hereto as exhibit CT-5T is a true and correct copy of a photo I took in 1986

from the other side of the stream in the same area reflected in photo constituting Exhibit 5-O. The contrast represented by these two photos is representative of the changes in the conditions all along Rush Creek.

CONCLUSIONS

54. There is no doubt in my mind that Rush Creek was an excellent trout fishery for approximately 50 years prior to LA's diversions in the late 1940s. I believe similar conclusions are warranted with regard to Lee Vining Creek as well. This conclusion is based on my expertise as a fishery biologist with considerable firsthand experience in this extraordinary basin.

Dated: September 22, 1993

Elden Vestal

ELDEN VESTAL

QUALIFICATIONS OF WITNESS

NAME: Elden H. Vestal

FORMER POSITION: Fisheries Management Supervisor (Retired 12-31-78)

LAST EMPLOYER: State of California, Department of Fish and Game, Region 3, Yountville, CA., 94599

HOME ADDRESS: 3042 Donna Drive, Napa, CA., 94558
Ph: (707) 224-3543

EDUCATION: University of California, Berkeley
Bachelor of Arts Degree, Letters and Science, 1934
General Secondary Teacher's Credential, 1935
Master of Arts Degree, Zoology, 1936
Graduate Work, Zoology, January - May, 1937

LENGTH OF EMPLOYMENT WITH DEPARTMENT OF FISH AND GAME: 41 years

EXPERIENCE: California Division of Fish and Game

1938-1940: Junior Inland Water Fisheries Researcher Participated in California Trout Investigations (Jan.-July 1938); assisted fisheries survey of Eel River watershed; participated in salmon and steelhead life history studies at Waddell and Scott Creeks and South Fork of Eel River (Aug. 1938-April 1939). Assigned District Biologist in charge of fisheries investigations and management in the Inyo-Mono Region of California (May 1939-June 1940). Principal activities included organizing and conducting a continuing inventory of all waters in the area; planning and conducting biological survey and fisheries and limnological studies at June and Gull Lakes; and planning, testing, and conducting first large-scale chemical treatments of inland lakes and streams in California for eradication of undesirable fish.

1940-1950: Became, in succession, Jr. Fisheries Biologist, Jr. Aquatic Biologist, Sr. Fisheries Biologist, Assistant Fisheries Biologist, and District Fisheries Biologist. Remained in charge and supervised all fisheries investigations and management in the Inyo-Mono Region from July 1940 to November 1950, including planning and

conducting Rush Creek Test Stream studies on trout planting and fishery yield, at June and Gull Lakes and Rush Creek Test Stream.

1950-1951: District Fisheries Biologist. Transferred to 9-county San Joaquin-Sierra Region 4 with headquarters in Fresno; in charge and supervision of fisheries investigations and management (December 1950 to December 1951). Activities all broadened by diversity and complexity of watersheds with increasing number of investigations and studies on dams, diversions, and other water quality development and problems and effects on anadromous and inland fisheries and wildlife resources.

California Department of Fish and Game

1952-1953: Continued as District Fisheries Biologist, in charge and supervision of fisheries investigations and management in 9-county San Joaquin-Sierra Region 4 (Jan. 1952-June 1953) with headquarters in Fresno.

1953-1960: Became Fisheries Biologist III and continued in charge and supervision of fisheries investigations and management in 9-county, San Joaquin-Sierra Region 4 (July 1953 through 1959) with headquarters in Fresno.

1960-1964: Assigned as Fisheries Biologist III to coordinate and supervise all water projects activities affecting fish and wildlife resources in 9-county Region 4.

1964-1966: Continued to November 14, 1966, as Fisheries Biologist III to coordinate and supervise all water projects activities affecting fisheries resources in 9-county Region 4.

1966-1971: Appointed Fisheries Management Supervisor for 15-county Central Coastal Region 3, (November 15, 1966-1971) with headquarters in Yountville, to coordinate and supervise all inland, coastal and bay-estuarine fisheries investigations and management activities concerning hatchery production and fish planting, habitat maintenance and improvement or rehabilitation, fish rescue, water projects and water quality, and anadromous fisheries.

1971 to Date: (Same as above, excluding water quality.)

PUBLICATIONS: Numerous reports and special articles (Calif. Fish and Game)
Co-author: Mammoth Lakes Sierra - A Handbook for Roadside and Trail, Published by Sierra Club, 1959, plus revisions. Republished 1989; (5th edition).

CHRONOLOGY: Elden H. Vestal--From Weekly and Monthly Reports to the Department of Fish and Game, 1938 - 1950

April 30, 1938: Left Coleville for Garner's Camp at Convict Lake and arrived at 10:30 a.m.; pending instructions as per accommodations for party awaited for Dr. Needham; later proceeded to open cabin reserved and unpacked some of equipment from U.S. Bureau of Fisheries truck.

May 1, 1938 : Day occupied in reconnaissance and checking catches at Convict Lake.

(Remained on Convict lake and Convict Cr. projects until July--then began Eel R. survey w/ Leo Shapovalov, Sr. Fisheries Biologist, and later work at Benbow Dam on salmon and steelhead migration project).

April 30, 1939: Transferred to Mono-Inyo programs.

May 1, 1939 : Recon of Inyo-Mono Area, particularly upper Rush Cr.-June L. drainages and checked special points with maps on hand.

May 2, 1939 : Using contour maps, made detailed circuit of June L., Gull L., Fern and loer Rush Crs., Silver L.; examined and photographed L.A. Ventur Weir, inlet and Grant L., dam at lower end of Grant L. Made general check of available catches for species, number and size of fish taken from open waters in the area.

(Next several days cont'd area orientation recon and checking catches HQ established at Fern Cr. Hatchery and as summer base, by May 20).

May 22, 1939 : Began RT marking for June L. creel project (at Hot Cr. Hatchery).

May 23, 1939 : Conferred with Dist. Rgr. Bill Fisher at LeeVining Rgr. Stat. This was my first general recon of LeeVining Cr.

May 26, 1939 : Second mtg w/ Fisher (and visit to LeeVining Cr., vicinity of Rgr. S

(Into June , 1939, cont'd June L. creel project, aided by TriC boys from Mammoth).

June 13, 1939 : Accompanied Slim Tatum, packer, and Leon Talbott, hatcheryman, and pack train to higher lakes in Rush Cr. drainage. Examined and took photos of Rush Cr. above and below Waugh L.; found Power Co. accepting about 100 CFS at Rush Cr. Meadows (Temp. 58.9 F) but allowing only about ½ CFS (Temp. 54 F) to flow in Rush Cr. below Waugh L. for 2½ miles of excellent stream. Arranged later w/ Mr. Killian, Supt. of Power House for at least 5 CFS to flow at all time

June 17, 1939 : Examined mouths of small streams entering Mono L. to point East of Mono Craters.

June 30, 1939 : Recon of Upper LeeVining Cr. and canyon.

July 1, 1939 : Returned to work on June L. creel project.

July 7, 1939 : Grant L. reported at very low level--6 cfs release for stock water (sheep) and no water being released from Upper Rush Cr. by Power Co.

July 8, 1939 : In evening went to see Ralph Goodman, City of L.A. in charge of water releases in Grant L. on possibility of cutting down portion of outflow. (Purpose to protect Grant L. biota from possible die-off).

July 10, 1939 : Conferred with Supt. Killian, So. Sierras Power Co.) with purpose of releasing more water into Grant L.

July 11, 1939 : Late afternoon, went to L.A. Venturi Weir and outlet of Grant L. to check on prevailing flows in and out of lake; no changes in general level of lake noted.

July 19, 1939 : Went to Grant L. and took temps and est. of flows in Rush Cr. above and below reservoir; took photos oflake and lower Rush Cr. at old highway bridge.

July 20, 1939 : ---For 1 hour in p.m. went to Grant L. to check on flows in and out of reservoir; flows now satisfactory toward raising level of lake.---

July 22, 1939 : Conferred with Rgr. Fisher at LeeVining Rgr. Sta. re: size (numbers) and range of sheep in Mono Basin.

July 23, 1939 : Accompanied pack train to Rogers Lks.---took notes and photos of lake --also notes and photos of flows in Upper Rush Cr.; est. 30 CFS with Waugh L. overflowing.---

Summary for July re: Grant L.: On July 7, it was reported that Grant L. was at a very low level; this was investigated in the evening. It was found that sheepmen in the Mono Basin were withdrawing over 6 CFS and little or no water was being released from Upper Rush Cr. by the Nev-Calif. Electric Corporation. A series of warm days occurring at this time increased the possibility of Grant L. becoming over-heated with consequent chance for an epidemic to arise among the biota in the lake. On the following day an appointment was held in LeeVining with Mr. Ralp Goodman, hydrographer for the Los Angeles Department of Light and Power Mr. Goodman declared that at least 25 CFS was required by the stockmen for irrigation purposes and to water the sheep on the Mono range. It was clear, hoever, that less water would be needed within about two weeks, since much irrigation would be discontinued. Goodman agreed to hold the release down if arrangements could be made with the power company to turn down some water supplementary to the regular outflow fr Silver L. Such arrangements were made and the decline of Grant L. level checked. On July 10-11, 14, and 22 the flows in and out of the lake and the condition of Grant L. itself was examined. By July 22, the level of the lake had raised about three inches. Especially, from July 27 on thunder showers and cool winds materially aided the general condition of the reservoir for its users.

(Rest of July and Aug. cont'd June L. creel project and lake survey work as time allowed---latter concentrated on high elevation waters).

August 3, 1939 : Checked on flows at Grant L.; with recent rains lake has risen abou 20 inches and inlet stream has increased markedly. Over 25CFS being released at the outlet instead of conserving the water while availabl

August 17, 1939: ---Checked on water in Rush Cr. and outlet below Grant L--flows in both places about the same--18 CFS ---.

August 24, 1939: ---At Grant L. examined inflow and outflow; the flows still about even, being between 15 and 18 CFS. Hiked into Parker L. basin and examined both stream and lake (elev. 8,350 ft.); ---trout checked (EB in catches were small and in poor condition.

August 30, 1939: ---Went to Grant L. and checked flows at inlet (L.A. Venturi weir) and outlet. Inlet flow est. 20 CFS while outlet about 18 CFS.

(In Sept., in addition to June L. project and survey work, began exper. w/ derris on chubs from Gull L. at Fern Cr. Hatchery).

Sept. 28, 1939: ---Drove to weir on Parker Cr.; since recent thunderstorms the flow through the weir has increased by approx. ½.
(Cont'd June L. project and derris experiments into October).

October 13, 1939: At Rush Cr. Egg-collecting station examined traps and stream for specimens of upstream migrant LL (for species photo work).

October 16, 1939: Test shot of LL made at egg-collecting station on Rush Cr.

October 22, 1939: At Rush Cr. egg-collecting station rephotographed male and female LL in color from traps.

(June L. creel project cont'd through rest of October.).

November 8 to November 18, 1939: In November returned to Benbow Dam and salmon and steelhead work there; later returned to winter HQ at Mt. Whitney Hatchery to work up June L. and other project data, for balance of Nov. and during winter months.

March 9, 1940 (Sat.): Examined part of Grant L.-Mono Tunnel Aqueduct where this structure crosses U.S. 395. Above Cain Ranch , diversions from Grant L. outlet pouring water at this time out into Mono Basin; one diversion was flowing 5 CFS. at Grant L. all but 35 ac. of ice gone and lake within 4 ft. of overflow; temps. taken and outlet stream est. at 40 CFS.---.

March 24, 1940: ---Reexamined lower Rush Cr. and diversions. There is now about 10 CF flowing in Lower Rush Cr., beyond the diversions and probably about 60 CFS distributed out over Mono Basin. Apparently, the D of W and P will try to reduce Grant L. before the bids are opened April 5 for the construction of the dam. Examined Grant L. (now entirely ice-free) and took temps. Examined Rush Cr. egg-collecting station and at L.A. Venturi (est. 50 CFS flowing passed weir).---.

April 2, 1940 : ---Examined aqueduct and diversions from Rush Cr. below Grant L. dam; examined shoal and gravel areas in Grant L. for spawning RT and took temps.

April 17, 1940: ---Until mid-afternoon examined Rush and Parker Cr. diversions in Mono Basin, mainly above U.S. 395, following reports of stranded trout in stream beds from which water recently diverted by stockmen.

April 23, 1940:---Investigated intense mining pollution in LeeVining Cr. reported by interested persons in LeeVining; the stream coming from the Simpson Mine near LeeVing Peak was found to be the main channel for tailings from the mine. The detritus was so heavy in the water that a small bit of solution held in the hand completely obscured the palm. The stream was flowing about 3 CFS with a water temp. of 43. OF. The unimpounded silt empties into Lower LeeVining Cr. near the LeeVining Rgr. Station.

May 1, 1940 :Checked available catches from Rush Cr. and Grant L.;lower Rush Cr. below Grant L. dam turned out some very good trout (LL and RT up to 8 inches long) and Grant L. was fair until strong winds appearing at about 11:30 a.m. drove anglers from the lake.

May 2, 1940 :Same thing occurred---Winds of high velocity (about 40 m.p.h.) drove most anglers from Grant L. and Silver L. and boat operators would not allow their boats to go out. (Important that good stream fishing available when lakes dangerous, espec. Grant and June Lks.)

May 9, 1940 :Gull L. to June L. to LeeVining Cr., to Lower Rush Cr., to Grant L. to Silver L. to June Lake and return to Gull L. Examined LeeVining Cr. from below power house to Rgr Station and although stream still very murky from mining debris it is by no means as heavily discolored as when seen a week ago; local anglers have contended that Lower Lee-Vining Cr. is one of the best trout sections in the canyon. Examined Lower Rush Cr. at Dombrowski place and at intervals to U.S. 395. Work on Grant L. dam and new road on west side progressing rapidly. Due to wind few anglers were seen on the lake and along shore.

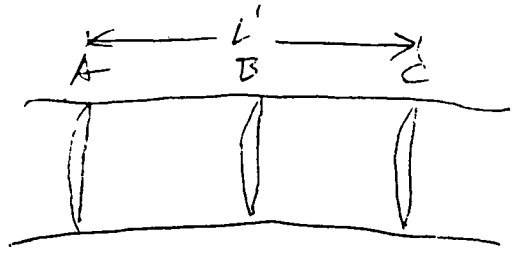
May 14, 1940 : Drove to Little Walker L.---set gill net at 12:45 p.m. on south side of lake. While examining lake shore and marginal bottoms trolled completely around the lake during remainder of day.

May 15, 1940 :At 6:30 a.m. drew gill net and found 13 EB enmeshed. Reset net on opposite side of lake and with plankton cone used at June L. made a preliminary haul over a surface course of ¼ mile; took and preserved stomachs, scales and measurements and generally examined fish taken. In evening examined plankton sample under microscope.

May 16, 1940 : Drew gill net and found 46 EB enmeshed (net had set 14 hrs.). Took stomachs, scales, weights and measurements from the fish taken; the trout, all apparently in fine condition, varied from 6 to 12¼ inches with an average length of 8.1 inches. Average weight was 7½ ounces. Took soundings of lake along length and width of lake and stepped off full shore distance. Little Walker L. is evidently 93.3 surface acres and has a maximum depth of 36 ft. 6 inches. Volume is 1945 acre ft.

May 17, 1940 : Again examined marginal areas and made second plankton haul over a course of half mile; preserved same for examination.---Returned to Gull L.

May 20, 1940 :



Av. width × Av. depth
= 20' × 0.8
= 16.0 ft²
× 5' Secs.
80.0 × 0.9 = 72 cfs

June 2, 1940 :In the afternoon drove to Grant L. dam and examined progress in construction; examined Rush Cr. at L.A. Venturi Weir, at Grant L. outlet , at culvert at old highway crossing, and two locations below U.S. 395. Returned to June L.

June 9, 1940 :In the afternoon examined the east shores of Grant L. where literally thousands of chub minnows (Siphateles obesus) 1 to 2½ inches long were observed in the marginal water.---

June 22, 1940 :---Drove to Grant L. and examined progress in construction of dam---.

July 8, 1940 :---Began study of I.C. Russell's "Quaternary History of the Mono Basin" borrowed from Mr. Thomas McKee (Gull L. resident and concessionaire at Gull L. for many years).

July 7, 1940 : Continued study of same.

July 13, 1940 : Continued study of same;---in the afternoon drove to Grant L. stopping to examine flow at L.A. Venturi Weir and on lower Rush Cr. to examine progress in construction of Grant L. dam.

July 30, 1940 :---drove to Grant L. and lower Rush Cr. stopping to examine flow in Reversed Cr., Rush Cr., at the L.A. Venturi Weir, examined constructi progress on Grant L. dam, and examined flows and condition of lower Rush Cr. Much of the new diversion from LeeVining canyon to the Mono Aqueduct is completed.
(Meantime, preparations stepped up for chemical treatment of Gull .).

Sept. 21, 1940 :---Continued around the "loop" in observation trip to Rush Cr., Grant L., and lower Rush Cr. Grant L. dam is now near completion and large tracts of aspen grove and sagebrush are being cleared below Rush Cr. Egg-collecting Station by bulldozers.---.

October 6, 1940:Returned (from supervisor Walter Dombrowski place on lower Rush Cr.) via Grant L. and Rush Cr. and examined progress in construction of Grant L. dam and the clearing work below Rush Cr. Egg-collecting Sta.

Nov. 20, 1940 : ---examined progress in construction of Grant L. dam; dam is nearly complete and lake is raising rapidly. Workmen have heavily muddied th entire lake. At L.A. Venturi Weir observed Loch Leven above the weir lately released from the Rush Cr. traps.

Nov., 1940 mo. report, par. 2: Two observational trips were made to Rush Cr. and the Grant L. basin Nov 5 and 20. Photos were made of the new dam and of the arboreal carnage from clearing operations in the upper section of the lake basin, particularly along Rush Cr. for a half mile below the egg-collecting station. At this point in time the dam is completed and Grant L. is raising rapidly. According to an engineer in the employ of the DWP all construction bldgs and housing are to be moved from City property by Jan 1, 1941.

March 12, 1941 :Accompanied by Messrs. Robert Gerth, Sr., and Jr., R.C. Lewis and Donald Lewis, District Ranger from LeeVining, skiied into Parker L. with survey equipment---. Ice sheet 24 inches thick with all but about one inch being snow ice. At 1:30 p.m., outlet flowing an est. 3½ CFS, temp. 38 F. At station 1, lake center and 200 yds from outlet, depth 17.5 ft., pH 6.4, O2 4.3 p.p.m. and temp. 40 F.---data from bottom water sample. Sample from the top just beneath the ice sheet tested pH 7.0, O2 at 8 p.p.m. and temp. 37 F. Trip in required 2 hrs.; run out aided by good snow required one hour. Clear, warm, cldy by nightfall.

July 27, 1941 : ---From mid-afternoon, drove to Grant L. and examined flows in lower Rush Cr. and at L.A. Venturi Weir;Grant L. has declined about 2 feet i past three weeks. (According to boatman, large numbers of Loch Leven are still being caught by troll fishermen).

August 1, 1941 :Examined water supplies and temperatures of Big Springs and Rush Cr. Springs (lower Rush Cr.); interviewed Walter Dombrowski in LeeVining, regarding the latter as to the source of the largest spring and below the old gravel pit of West Portal.---.

August 10, 1941:---During lull of mid-afternoon (June L. creel project) drove to Grant L. to examine flows in Rush Cr. and at L.A. Venturi Weir (Grant L. had declined about 10 ft.), number of boats and anglers on the lake, number of anglers along Rush Cr. above the weir, ---.

August 29,1941 :---Drove with Messrs. Alan C. Taft and Nate F. Milnor to Little Walker L; examined outlet of lake and stream below; examined intake for the Mono Aqueduct.

Sept. 12, 1941 :Via pack stock from Silver L., rode into Parker L. for survey of that water in view of proposed golden trout culture there. A gill net set for 3 hours took 4 EB; one escaped in hauling net. Av. and extremes in CF for 6 trout (3 more borrowed from angler) were).982 (.882--1.102). Surface area of lake was computed (pacing method) at 16.3 acres. Plankton sample taken and preserved showed abundant copepods and water fleas for this time of year. Water sample taken at 22,5 ft tested 51F, pH 7.8, and 02at 7.8 p.p.m. (Est. potential for 300 brood fish).

October 22, 1941:---En route from LeeVining found Rush Cr. low and no water at all coming from poer house;examined L.A. Venturi Weir and Rush Cr. traps (Early November chemical treatment of Crystal L., Los Angeles Co.).

Nov. 8, 1941 :---Drove to Rush Cr. Egg station to Grant L. dam to Lower Rush Cr. to East Portal of Mono Tunnel. Examined outlet (as much as could be seen) at Grant L. dam and lower Rush Cr.; examined Upper Owens R. above and below East Portal. Stream and marginal areas found to be badly scoured and silted by recent huge volumes of water (200 CFS) from tunnel; many rough fish and small trout left stranded in pools and bends in old river channels flooded. Many loch leven apparently were driven from their spawning grounds and migrated through the tunnel into Grant L., since promptly the traps on Rush Cr. became so laden with fish that Leon Talbott had to shut them down.

Dec. 24, 1941 : Examined flows in Reversed Cr. (est. 3 CFS) and Rush Cr. 50 CFS) both of which streams are seemingly nigh for this time of year. (Grant L. beginning to freeze over).

(Left for military service (after vacation) on or about Dec. 1, 1942. No activities recorded re: Rush Cr. and Grant L. through the year.).

April 30, 1946: Examined lower Rush, Parker, and Gibbs Creeks following report from Walter Dombrowski of LeeVining that diversion of flows in the stream was causing loss of "hundreds" of trout. Rush Cr. was reduced to 14 CFS, Gibbs Cr. ws intermittent, and Parker Cr. was reduced to a flow of about $1\frac{1}{2}$ CFS. One brown trout about 12 inches long was seen stranded in Gibbs Cr.; none were found in the others.

May 24, 1946: ---At L.A. Venturi Weir on Rush Cr. watched some 33 large Black-spott trout attempt make the dash over the weir (est. flow 125 CFS). Fish earlier reported by Warden Jim Loundagin. Five more seen downstream below the weir.

Sept. 17, 1946: June L. to Parker L. and return. Examined Parker L. and Creek above and below lake from standpoint of possible EB egg source. It was inferred from observations that Parker L. would make and excellent supplementary egg source to Little Walker L.;a road could rather easily be built directly to the lake.

Oct. 23-24, 1946: Field conference with Brian Curtis, Supervising Fisheries Biologist During the afternoon on Oct. 23 typical sections of Loer Rush Cr. were seen in view of the proposed test stream work there.---Later the County Assessor and Walter Dombrowski were interviewed re: property ownership along Lower Rush Cr.

Mo. rpt. for Feb., 1947, p. 1, item 3:
Approximately 2 full days were occupied in resurvey and preparationsof the Rush Creek Test Stream area, inwhich survival to the creel studies will commence May 1. Conferences were held on May 2 with Walter Dombrowski,who will operate the project, and Co. Supervisor, Venita R. McPherson, whose aid has been enlisted in construction of a road bridge across the creek, which will provide access to about 2 miles of the stream above.

Mo. rpts. for Mar., Apr., May, Jun., Jul., Aug., Sept., Oct., Nov.:
Preparations for and initiation of Rush Cr. Test Stream creel project.

Mo. rpt. for Dec. 1947:
During the afternoon of 4 Dec 1947, Vestal accompanied Mr. Claude James Hydrographer, City of L.A. DWP, on his monthly measurement of Rush Cr. flow in the test stream area taken at the upper bridge. Measurements made with a Gurley current meter, indicated a flow that date of 23 CFS. In addition, notes were made and temps. taken along the stream from the barrier in the Gorge down to the lower bridge.

Mo. rpt. for January , 1948:
During the afternoon of 14 Jan., a series of water samples were taken and analyzed at 4 stations along the test stream starting from the lowere bridge. A jump stick measurement of stream flow was taken at a station about 100 yds. above this bridge for comparison with the metered flow by the City of L.A. DWP earlier in the week. Examination of the upstream barrier in the Gorge showed it to be operating in good condition The downstream weir, in the extreme lower portion of the stream will have to be rebuilt as soon as possible.

Mo. rpts. for Feb.,Mar.,Apr.,May,Jun.,Jul.1948:
Rush Cr. Test Stream creel project was cont'd according to plan.

Mo. rpt. for Aug. 1948:
Rush Cr. Test Stream creel project cont'd according to plan.
On Aug. 11, the flow was determined (float method) by Williams and Vestal at a station 1 mile above the mouth of the stream to be 15.3 CF It is believed that from now on no appreciable further decline in flow will occur.

Mo. rpt. for Sept., 1948:
Rush Cr. Test Stream creel project was cont'd.---Fall grading of the test stream road was begun Sept. 27. On this same date it was observe that the stream bed above and over the upstream barrier was completely dry, while approx. 15 CFS is flowing in the test stream at a point ½ mile below the barrier from spring entries.

Mo. rpt. for Oct., 1948:
Rush Cr. Test Stream creel project was cont'd.

Mo. rpt. for Nov., 1948:
RCTS creel project data were analyzed and project report prepared.

Mo. rpt. for Dec., 1948:
Five trips to RCTS project area made during the month, occupying 3 days for inspection and cleaning of downstream weir and fish trap near the mouth of the stream. On Dec. 18, one BN 13½ inches long was found dead on the screen.

Mo. rpt. for Feb, 1949 :
RCTS visited on Feb. 3 and 16 and downstream weir and trap inspected and cleaned.

Mo. rpt. for Apr., 1949:
RCTS project plans and preparations for continuance completed. Plan of City of L.A. DWP for installation of Parshall flume at upper bridge was postponed (at the request of the Dept. of Fish and Game).

Mo. rpts. for May through Dec., 1949:
RCTS project cont'd on schedule and end-of-season data analysis and report completed Dec 20, for submission Jan. 9, 1950.

Mo. rpts. for Mar. through Dec., 1950:
RCTS creel project cont'd as scheduled and data summarized and report outlined(for later completion).
In July, flow in the stream continued to decline to 6 CFS, consequence of several dry years and a major diversion out of the Mono Basin by th City of L.A. DWP. In Sept., the stream increased slightly, following mid-month precipitation.

(E.H. Vestal transferred HQ to District 6, Fresno; completed about Feb. 1,19

DIVISION OF FISH AND GAME

Fishculturist's Weekly Report

INSTRUCTIONS FOR MAKING THIS REPORT

At the end of each week forward a concise report of the official duties performed during the week. State condition of the weather, number of fish taken, spawned, etc., and any items of interest connected with the work.

HATCHERY June Lake, Mono County DATE May 7, 1939

SUNDAY April 30 *(Give date)*

Richmond to Bakersfield via Walker Pass to Lone Pine. Stopped for brief parley with William A. Dill in Fresno. Stopped at a number of places along the Kern River to examine that stream and items of geological and biological interest in the drainage.

MONDAY May 1

Lone Pine to Independence to Bishop to Hot Cr. to June Lake. Stopped at Mt. Whitney to confer with Mr. George McCloud. Stopped at U.S.Forest Service office in Bishop for maps of Mono-Inyo area. Stopped at Hot Cr. to confer with Bob Lewis. Looked over upper June Lake-Rush Cr. drainage and checked special points with maps on hand.

TUESDAY May 2

Using contour maps, made detailed circuit of June Lake, Gull Lake, Fern and lower Rush Crs., Silver Lake, examined and photographed L.A.-Venturi weir, inlet and Grant Lake, dam at lower end of Grant Lake. Made general check of available catches for species, number, and size of fish taken from open waters in the area.

WEDNESDAY May 3

At north end of June Lake observed Mr. Hussey of Fern Cr. hatchery and assistants locate, seine, and take eggs from gravid steelhead rainbows attempting to spawn in sparsely gravelled areas. In the afternoon conferred with C.J. Walters, warden from Independence; also again conferred with Mr. George McCloud who brought eggs(RT) from Mt. Whitney for culture at Fern Cr.

(OVER)

THURSDAY May 4

In the morning went to Gerth's pier and observed large seine and mot
used to attract fish for eggtaking. Using U.S.G.S. maps checked Mammoth
Cr. and Mammoth Lakes area insofar as penetrable to snow banks. On Deadr
Cr. took data and photographed a fishwheel and dam placed at the mouth
the canyon by a local resort owner; this barrier has cut off some choice
trout stream for 2/3 mile below the popular Big Springs Public Camp.

FRIDAY May 5

In the morning checked creels in Reversed Cr. and Rush Cr. area
until 10 a.m. Rest of day, through noon, utilized in work on manuscript,
for publication and in correspondence largely pertaining thereto.

SATURDAY May 6

From 5a.m. to 9a.m. checked available catches at Gerth pier on June
Lake for species, size range, and numbers of fish caught; total would
approximate 900 fish, of which at least half were over 10" long. Rest of
day utilized in added work on manuscript, correspondence, stomach analys
on trout from Benbow Dam, rearrangement of specimens collected at Benbo
and cleaning up Ford 5952.

RECAPITULATION

Fish and Eggs (Variety)	From Previously Reported	Taken or Received	Balance on Hand

Signed

DIVISION OF FISH AND GAME

Fishculturist's Weekly Report

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HATCHERY June Lake, California DATE May 21, 1950

SUNDAY May 21 *(Give date)*

Day stormy and generally inclement. Practically entire day occupied in preparing correspondence, weekly report, and review of recent conservation literature received.

MONDAY May 22

June Lake to Mammoth to Hot Cr. hatchery and return. After establishing set-up at Hot Cr. rearing ponds began marking Rt of 20,000 held back for experimental plant in June Lake. Marking Ad and Lv. Assisted by tri-C boys Pierce Smith, Bill Williard, and Melvin Brewer; total for day: 3220. Fish planted by Johnson and Gilman in N end of lake. Accompanied by Bob Lewis went to Long Valley project and found pond level for some with est. 400 pounds fish dead in muck on bottom; because of such bottom and really condition of water useless to attempt seining of few live fish left.

TUESDAY May 23

June Lake to Mammoth to Hot Cr. hatchery to receiving and return to June Lake. Continued marking Rt with tri-C boys Smith, Williard, and Brewer. Boys are cooperating very well and are doing fine job of marking. Total for day 4774. At receiving Ranger Stat. interviewed Dist. Ranger Bill Tsher and arranged for tri-C boys to help in creel census at June Lake.

WEDNESDAY May 24

June Lake to Mammoth to Hot Cr. hatchery to West Portal and return. Continued marking Rt assisted by tri-C boys Smith, Williard, and Brewer. Total for day 2177; together with those from yesterday, making total of 10,952, fish planted with tank truck by Talbott, Gilman, and Gray. Went to West Portal for detailed contour sheets of June-Grant Lake area.

(OVER)

THURSDAY May 23

June Lake to Mammoth tri-C camp to Hot Cr. hatchery and return. Continued marking of Rt with assistance of tri-C boys Smith, Hilliard, and Brewer. Total for day: 7200.

FRIDAY May 24

June Lake to Mammoth to Hot Cr. hatchery to Leevining and return. Cont'd marking Rt with assistance of tri-C boys Hilliard, Brewer, and subst. for Smith, Andy Anderson. Total for day: 5165. Yesterday's and today's marked fish (combined total of 12,365) planted in N. end of Lake by Talbott, Gray, and Gilman. Dep. Dist. Ranger Fisher and made final plans for tri-C boys boys from Mammoth Lake spike camp to assist creel census at June Lake.

SATURDAY May 25

June Lake to Mammoth to Hot Cr. hatchery and return. Completed marking of Rt for experimental plant in June Lake, assisted by Hilliard, Brewer, and two Scouts, also from Mammoth camp. Total for day (finished 2 p.m.): 4..3 fish planted in N end of lake by Talbott and Gray. In the evening assisted boatmen at Camp on June Lake in taking census of creels.

RECAPITULATION MARKING OF HOT CR. RT, AD & LV, FOR JUNE LAKE EXPERIMENT

Fish and Eggs (Variety)	From	Previously Reported	Taken or Received	Loss	Shipped	Balance on Hand
~~DATE~~	~~RAINBOW~~	~~HILLIARD~~	~~SMITH & substs.~~	~~BREWER~~	~~LOST~~	~~MARKED~~
May 22	3000	550	535	535	0	2220
" 23	1325	1200	1150	1100	1	4775
" 24	1802	1800	1575	1400	4	8177
" 25	1721	2000 1913	1919	1550	-	7556
" 26	1325	1715	500	1425	3	5165
" 27	1613	1300	500	1050	1	4363
	3098	8665	6179	7060	10	30000

00 112

Signed

6393 11-33 SM
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STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

Fishculturist's Weekly Report

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At the end of each week forward a concise report of the official duties performed during the week. State condition of the weather, number of fish taken, spawned, etc., and any items of interest connected with the work.

HATCHERY ~~June Lake, California~~ DATE ~~June 18, 1939~~

SUNDAY June 11 *(Give date)*

~~Took tri-C boys Melvin Brewer and Maurice Nelson to tents on June Lake to continue creel census. Returned to Fern Cr. hatchery and after tending to correspondence and preparation of report, resumed work on manuscript for Fisheries meetings. Through late afternoon until evening; checked catches at June Lake piers.~~

MONDAY June 12

~~Took tri-C boys Brewer and Nelson to Gerth and Grindley piers on June Lake to continue creel census work. Returned to Fern Cr. hatchery and continued work on manuscript for Fisheries meetings. Left close of day, returned tri-C boys to Gull Lake spike camp and continued checking until evening.~~

TUESDAY June 13, 1939

~~Took tri-C boys Maurice Nelson to June Lake to continue creel census. Accompanied Wm Tatum, Leon Talbott and pack train to Hilltop Lakes in Rush Cr. drainage and assisted in planting of Eastern Brook trout. Examined and photographed Rush Cr. above and below Mauth Lake; found Power Company releasing about 100 CFS at Rush Cr. meadows (Temp. 53.0 F) but allowing only about ½ CFS (Temp. 54.0 F) to flow in Rush Cr. below dam for 2½ miles of excellent stream. Arranged later with Mr. Killian, superintendent, for at least 5 CFS to flow at all times.~~

WEDNESDAY June 14

~~Tri-C boys off duty. High wind of almost gale proportions kept boaters off lake practically all day. Went to Bishop for ream of white manuscript paper and additional supplies; arranged with Mr. Bradley at Hazard Service Station to exchange spark plugs with those of Division. Returned to June Lake and checked catches until evening.~~

(OVER)

THURSDAY June 15

Took tri-C boys [illegible] to June Lake to continue creel census. High and cold wind throughout day generally spoiled angl. on lake and many fish[illegible]. At Fern Cr. hatchery resumed Fisheries manuscript. Returned Brewer to [illegible] of day. New C boy Robert Higar off duty.

FRIDAY June 16

Took tri-C boys Brewer and Higar to June Lake to continue creel census. Returned to Fern Cr. hatchery and continued work on manuscript for Fisheries meetings. Swept and straightened up V8 3952; checked distributor points and oiled fan bearing.

SATURDAY June 17

In the morning, took tri-C boys Melvin Brewer and Robert Higar to June Lake to continue creel census. Went to Leevining to arrange with District Ranger Fisher for C-Boys to live at guard station at Gull Lake in my absence until June 29. Examined mouths of small streams enetering Mono Lake to point East of Mono Craters. Returned to June Lake and completed and read to copy paper for Fisheries meetings; checked catches until evening at north pier and measured and took scales from Red Hts returned from the lake.

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

60 118

[SIGNED]

95875 12-38 5M. STATE PRINTING OFFICE

THURSDAY June 9

Attended symposium on Dams and the Problem of Migratory Fishes at Stanford University. Removed and packed books and papers of mine in the laboratory at the Natural History Museum. Returned to Richmond and repacked equipment for trip to June Lake.

FRIDAY June 10, 1939

Richmond to Tracy to Big Oak Flat to Yosemite to Tuolumne Meadows to Lee Vining to June Lake via Tioga Pass. Spent 3 hours in afternoon from 2 to 4 p.m. visiting Yosemite Valley and the hatchery there. Stops were made en route to Tioga Pass at upper Tuolumne River, Lake Tenaya, Snow Flat, Tuolumne Meadows, and upper Lee Vining Canyon.

SATURDAY July 1

Checked catches with trip boys assisting at June Lake for most of day until evening. In midday, when angling on lake some but at a lull, tended to accumulated correspondence.

RECAPITULATION

Fish and Eggs (Variety)	From	Previously Reported	Taken or Received	Lost	Shipped	Balance on Hand

00 122

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THURSDAY July 6

Tri-C boys off duty. Remained at June Lake and checked creels throughout day. Loreof marked trout are shown up in catches almost daily; scales and measurements re taken of these trout as they appear.

FRIDAY July 7, 1939

In the morning took the remaining tri-C boy to June Lake to assist in creel census work (Melvin Brewer having left to take over a job in S. Calif.). Went to Bishop for supplies. Reported that Grant Lake was at very low level and investigated this; stockmen are drawing out about 6 CFS and there is none being released from upper Rush Cr. by Power Co.

July 8
SATURDAY Took tri-C boy to June Lake and checked creels through most of day until evening. For a time in the afternoon, took CF&G boat on the lake and mapped certain of plant beds, gravel and sandy areas and locations of springs supplying the lake. In the evening went to Lee Vining to see Mr. Ralph Goodman, City of L.A., in charge of water release in Grant Lake on possibilities of cutting down a portion of the outflow.

RECAPITULATION

Fish and Eggs (Variety)	From	Previously Reported	Taken or Received	Loss	Shipped	Balance on Hand
		00 124				

Signed .....

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DIVISION OF FISH AND GAME

Fishculturist's Weekly Report

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HATCHERY June Lake, California DATE July 16, 1939

SUNDAY July 9 (Give date)

At June Lake, checked creels in morning until 10 a.m.; returned to Fern Creek Hatchery and tended to correspondence and weekly report. Returned to June Lake and checked creels until evening.

photos July 10 & ab... Saddlebag

MONDAY July 10

Took tri-C boy to June Lake to assist in creel census, and with him checked creels until 11 a.m. Interviewed Supt. Killian, S.S. (Southern Sierra) Power Co., with purpose of releasing more water into Grant Lake. Tended to Correspondence. [illegible] drove to Saddlebag Lake and hiked into upper chain of lakes including Steelhead lake at head of Lundy Canyon. Returned to Fern Cr. hatchery.

TUESDAY July 11, 1939

[illegible] [illegible] Bill Lake [illegible] camp for change of tri-C help boys [illegible] [illegible] [illegible] [illegible] plant of [illegible] from Fern Cr. hatchery to Thousand Island Lake; trout arrived in real fine condition after 5 hr. trip; lost - 23 fish out of 20,000. Returned to June Lake and checked creels until [illegible]. Before night went to [illegible]-Venturi weir and outlet of Grant lake to check on prevailing flows in and out of lake; [illegible] [illegible] in general level of lake noted.

WEDNESDAY July 12

Took tri-C boys to June Lake to assist in creel census and with them checked creels until 10:30 a.m. Returned to Fern Cr. hatchery and tended to correspondence. Returned to June Lake and checked creels until evening. Noticeably since before the July 4 holiday fishing on the lake has declined [illegible] [illegible] effort (at times more) in angling; the [illegible] [illegible] [illegible] [illegible] in the lake.

(OVER)

80 125

DIVISION OF FISH AND GAME

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HATCHERY [illegible], California DATE July 23, 1939

SUNDAY July 16 (Give date)

Took tri-C boys to June Lake to assist in creel census work. Returned to Fern Cr. hatchery and tended to correspondence and weekly report. [illegible] then returned to June Lake and checked creels until evening. Noticeably fewer of the 1 and two year old rainbow trout are being taken by anglers; more of this year's [illegible].

MONDAY July 17, 1939

In morning took tri-C boys to June Lake to assist in creel census there. Went to [illegible] near Bridgeport and hiked in to Barney L. on upper Robinson Cr.; took notes and photographs on lake and Robinson Cr. (an excellent [illegible], especially between Barney L. and [illegible]); returned to Bridgeport. Made brief visit to Lundy L. and examined creek above and below lake; [illegible]. Returned to Fern Cr. hatchery.

TUESDAY July [illegible]

One of tri-C boys off duty. Took other to June Lake to assist in creel census. [illegible] Convict Cr. [illegible] with [illegible] condition [illegible] of marked trout now appearing [illegible] June L. Returned to June L. and [illegible] balance, checked creels and took measurements and scales on marked trout available until evening.

WEDNESDAY July 19, 1939

Both tri-C boys off duty. Went to Grant L. and took temperatures and est. of flows [illegible] Cr. above and below reservoir; took photographs of lake and [illegible] Cr. at old highway bridge. Returned to June L. at 10 a.m. and until evening checked creels and took measurements, weights and scales on marked trout appearing in catches. [illegible] trout of year now being caught.

(OVER)

00 127

THURSDAY July 10

Two trips by to June L. to assist in creel census, set up torsion balance and continued taking measurements for check on condition factor and appearance of marked trout now appearing in catches. For 1 hr. in after noon went to Grant L. to check on flows in and out of reservoir; flows now satisfactory toward raising level of lake. Returned to June L. and continued creel census and taking of measurements.

FRIDAY July 11

Two trips boys to June L. to assist in creel census. Packed and returned torsion balance to Convict Cr. Str.; then went to Bishop for checkover and servicing of V-8 and for supplies, including poster printing outfit. Returned to Orr Cr. and completed printing on poster calling attention of anglers to marked trout in June L.; at lake set up poster and checked catches in remainder of day.

SATURDAY July 12

Two boys to June L. to assist in creel census. Went to Grant L. to check on flows in and out of lake; level of lake raising--up about 8" over level of 7/come on July 10. At Lee Vining Ranger station, interviewed Ranger and obtained information on size and range of fleet of keep in the Basin. Prepared another copy of poster on marked trout and checked catches in afternoon until evening.

RECAPITULATION

Fish and Eggs (Variety)	From	Previously Reported	Taken or Received	Loss	Shipped	Balance on Hand
		90 128				

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HATCHERY June Lake, California DATE July 30, 1939

SUNDAY July 23 *(Give date)*

Tri-C boys assigned to Cert. and Grindley piers on June Lake to continue creel census. Accompanied pack train to Upper Rogers L. and assisted in planting 2t; loss of 1 fish out of 11,000 allotment. Took notes on and photographed lake. On returne stopped for notes and photographs of flow at outlet Fern Cr.; est ± 30 CFS, with Gaah L. overflowing. Returned to June Lake and checked creels for rest of day until evening.

MONDAY July 24

Four tri-C boys to piers on June L. to continue creel census work. Forced to remain indoors and remained on hand to check creels throughout day. Lake is returning catches now an admixture of varied sizes, apparently better than half of returns consists of this year's plant.

TUESDAY July 25, 1939

Four tri-C boys to June L. to continue creel census. Went to Pine Cr. pack station. Thence to upper Pine Cr. basin and lakes; thence to upper French Canyon and Loon Lake. According to packer, Mr. Bro n, Loon L. had been dynamited. This was found to be true, since dead Golden Trout found in shallows of L. in the outlet stream showed ruptured air bladders and badly hemorrhaged blood vessel networks in the brain. Notes and sketch plans from examination of lakes in Pine Cr. basin seen. Returned to Fern Cr.

WEDNESDAY July 26

Four tri-C boy to June L. to assist in continuing creel census; other boy left duty. Went to Virginia Lakes basin and hiked into upper section and to cross over trail into upper Green Lakes basin. Made notes, photographs and sketches of upper Virginia Lakes area and preliminary sketch-plan of upper Green Lakes area. Returned to Fern Cr. hatchery in evening.

(OVER)

00 128

THURSDAY Aug 3 19 39

Too one of tri-C boys to June Lake to assist in creel census; other off duty. Remained on hand at June Lake and checked catches at one of ; At 4 p.m. went to Grant Lake to check on flows; with recent rains Grant has risen about 20" and the inlet st ream has increased markedly. More (over 26 CFS) is being released at out let instead of conserving the wa now while it is available.

FRIDAY Aug 4

In the morning took tri-C boys to June Lake to assist in creel census. Returned to Fern Cr. hatchery and tended to correspondence. Went to Wes Portal to borrow polar planimeter for surface area on Gull Lake. Returned to June Lake nd checked catches for remainder of day; from one catch too scales and measurements from marked trout returned.

SATURDAY Aug 5

In the morning took tri-C boys to June Lake toe assist in creel censu

Anglers were twice driven from lake by heavy downpour from thunderstorm. Made plankton haul at 9 a.m. from Gerth pier to center of lake and retu using diver; put net down to about 30'. Haul rich in Volvox, perplobator and ostracod crustaceans. Another haul along the surface in afternoon rich in ostracod crustaceans, Volvox, and copepods. At end of day returned tri-C boys to Gull Lake camp.

RECAPITULATION

Fish and Eggs (Variety)	From	Previously Reported	Taken or Received	Loss	Shipped	Balance on Hand

00 132

(over) Signed

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DIVISION OF FISH AND GAME

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HATCHERY June Lake, California DATE August 13, 1939

SUNDAY Aug. 6 *(Give date)*

In the morning took tri-C asst. to June Lake to continue creel census work. Returned to Fern Cr. hatchery and tended to correspondence and the preparation of a tracing of Gull L. Checked catches at June L. until 2p. then took rest of afternoon off.

MONDAY Aug. 7

Took tri-C boys to June L. to continue creel census. Went to Gull L. and throughout morning took soundings of lake in two directions. Max. depth found at 63'-8"; av. depth, 43'-6". Returned borrowed polar planimeter to West Portal (Engineer Herb Chapton). Returned to June L. and checked creel for rest of day.

TUESDAY Aug. 8, 1939

After taking tri-C (one boy off duty) to June L. with instructions to take an additional series of stomachs, drove to Virginia Lakes basin, hiked into Summit, Upper and Lower Hoover Lakes, and Gilman Lake and took notes and photographs of them and Green Cr. from outlet at Summit Lake to inlet Gilman L. Returned to Fern Cr. hatchery.

WEDNESDAY Aug. 9

Tri-Cs off duty. Checked catches at June L. until 11a.m. then interviewed residents on Gull L., outlining briefly plan for removal of chub minnows from lake; all persons very much in favor of this and offered help. In Leevining spoke to Dist. Ranger Fisher and arranged for additional tri-C help and equipment with which to treat the lake and handle the fish. Returned to June L. and checked catches through rest of afternoon and evening.

(OVER)

00133

THURSDAY Aug 17

[illegible] to June L. to [illegible] creel census. [illegible] duty. [illegible] to current meter on Rush Cr. and to outlet [illegible] Grant Lake; flows in [illegible] places [illegible] cfs. Returned to June L. and check catches until [illegible], then went to Convict Cr. [illegible] torsion balance from [illegible] for recheck data on condition factors of marked trout.

FRIDAY Aug 18, 1939 (Ethel accompanied on this trip)

Took tri-C boys Brunson and Hardy to June L. to continue creel census. Day [illegible] sultry and fishing on the lake generally slow. Went to Saddlebag Lake and hiked into upper Leevining and Lundy basins. Examined Lower Conness glacier Lake; water from glacier milky, causing Conness L. and Greenstone L. to be pale greenish milky in color. Took notes and pho[illegible] also of [illegible] and Cascade Lakes in upper Lundy basin. Returned to Fern Cr[illegible]

SATURDAY Aug 19

Together with tri-C boys Hardy and Brunson [illegible] torsion balance and throughout the day took data for recheck on condition factors of marked Rt from [illegible] Cr. Despite sudden change in barometer during night, fishing during the day was good, some very nice catches returned. One catch revealed [illegible] of the marked series.

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

00 136

[SIGNED] ____________________

THURSDAY Aug 24, 1939

Took tri-C boy to June Lake to assist in creel census. After checking catches at Corth pier until noon, drove to Grant Lake and examined flows both in and out of lake. The flows are still at not even, being between 15 and 18 CFS. Hiked into Parker Lake both and examined both stream and lake (8350'). This is one of the most picturesque of the typical glacial basins seen so far; trout checked in catches were small and in poor condition.

FRIDAY Aug 25

Took tri-C boys to June Lake to continue creel census. Returned to Fern Cr. hatchery and tended to correspondence and checked over some weekly reports sent by Lee Shapeyelov. Returned to June Lake and checked catches until 8p.m. Drove to upper Deadman Cr. near Crestview and examined stream in two places. Deadman Cr. goes dry on the pumice flats 3 mi. West of Crestview but is an excellent stream above for about 2½ miles.

SATURDAY Aug 26

Took tri-C boys Hardy and Brunson to June Lake to continue creel census. High wind throughout day has kept many anglers off the lake; those staying out half to fish at greater depth. Rescued fifty EB and five LL 3 to 7" from isolated chunk of Reversed Cr. near Tatum property; fish planted in Reversed Cr. opposite Fern Cr. Lodge. Returned to June Lake and checked catches for rest of day.

RECAPITULATION

BR AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

00 188

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DIVISION OF FISH AND GAME

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HATCHERY June Lake, California DATE September 5, 1939

SUNDAY Aug 27 *(Give date)*

Took tri-C boys Hardy and Brunson to June L. to continue creel census. Tended to correspondence. Until 1:30 p.m., accompanied Mr. Wallace Garth to Adobe Meadows-Indiana summit area to see this vast section and timber range. Returned to June L. and checked creels for rest of day.

MONDAY Aug 28, 1939

Took tri-C boys Hardy and Brunson to June L. to continue creel census. Returned to Fern Cr. hatchery and rode to lakes on Reversed Peak and planted 2500 RT in the two Largest. After returning pack stock, tended to correspondence. Returned to June L. and checked catches for rest of day.

TUESDAY Aug 29

Took tri-C Hardy to June L. to assist in creel census. Returned to Fern Cr. hatchery and analyzed contents of 30 RT stomachs taken in May from June L. Two stomachs contained entirely Cladocera aggregating about 5000 animals; another contained 3 sticklebacks 2½ inches long.

WEDNESDAY Aug 30

Checked catches at June L. until early afternoon (both Cs off duty). Went to Grant L. and checked flows at inlet (L.A.-Venturi weir) and outlet. At time visited, inlet flow est. 20 CFS while outlet about 18 CFS. Returned to June L. and checked catches until evening.

(OVER)

THURSDAY Sept 28, 1939

Took tri-Cs loaned by Forest Service to Saddlebag L. in assisting Mr. Hussey clean Fern Cr. hatchery of remaining Black-Spottes and Rainbow T. Fish packed in shoulder cans to Cascade, Steelhead, and Hummingbird Lakes. Returned boy to Gull L. spike camp at end of day.

FRIDAY Sept 29

Tri-C boys off duty. Cleaned exper. troughs at Fern Cr. hatchery and took additional notes on Derris experiments in progress. Went to Leevining for supplies. On returning, checked catches at June L. for remainder of day. At Fern Cr. cleaned trough holding fresh chubs for Derris experiments and introduced at 5:20 p.m. another series of fresh chubs into troughs containing water plants and Derris 1:100,000.

SATURDAY Sept 30

Took tri-C boys Harry and Brunson to June L. to continue creel census. Find water plants still resistin; Derris both 1:100,000, but all chubs dead at 7a.m. Emptied and cleaned both experimental troughs, the hatchery may be close for season. Tended to correspondence and preparation of weekly and monthly reports. Returned tri-Cs to Gull L. spike camp at end of day.

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

00-146

[SIGNED]

THURSDAY Oct 5, 1939

Took tri-c Brunson to Juns L. to continue creel census. Following receipt of glass shooting for aquarium for photographing fish, painted backdrop in oils. Drove to Grant L. and examined lower Rush Cr. for Loch Leven preparing to move upstream to spawn, atleast 150 of the fish were seen in the stream ½ mi. from upper Grant L.

FRIDAY Oct 6, 1939

Dry cold and inclement with sleet squalls and snow. Drove to Bishop to obtain rubber frame for photo aquarium; had VS 5202 lubricated and generally serviced. On returning to June L., arranged with boatmen to obtain full season's records of boats on the lake.

SATURDAY Oct 7, 1939

Snowy weather continuing with more wind and sleet.

Half day taken off. Sorted photographs taken of lakes and streams in Mono-Inyo Area this year, preparatory to filing them. Through the day fishing on the lake was practically nil due to the poor weather conditions

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

55675 [illegible] 5M.

00 148

[SIGNED]

THURSDAY Oct 1[illegible]

~~Fern Cr. to Hot Cr. Hatchery [illegible]. [illegible]~~

~~[illegible] 000 [illegible] Brook trout [illegible] [illegible] Lake.~~

FRIDAY Oct 1[illegible], 1939

~~Through out day, built [illegible] painted [illegible] aquarium to be used in color-~~

~~photography, [illegible] [illegible] [illegible] [illegible]; [illegible]~~

~~for [illegible] [illegible] subjects [illegible] [illegible] [illegible]. [illegible], drove to [illegible]~~

~~Cr. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]~~

~~of [illegible] [illegible] Loch Leven.~~

SATURDAY Oct 1[illegible]

Drove to [illegible] [illegible] photography and other [illegible]. [illegible] out into

[illegible] Cr. [illegible] [illegible] [illegible]

[illegible] sections of [illegible] [illegible]

intervals [illegible] [illegible] [illegible]

cat[illegible] [illegible]

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

00 150

[SIGNED] ______________________

53575 12-38 5M. [illegible]
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DIVISION OF FISH AND GAME

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HATCHERY June Lake, California DATE October 22, 1939

SUNDAY Oct 15 (Give date)

Drove to shaft #1 and returned via the lake and Devil's Punch Bowl. Pumping from the tunnel has again created a small lake in the basin NE of the shaft. Returning to June Lake, checked catches until evening, when resident of the town asked Div. of Fish & Game to claim newly killed spike buck deer near June L. junction; on investigation (shortly after dark) found deer taken by someone.

MONDAY Oct 16, 1939

Fern Cr. to Hot Cr. hatchery to Rush Cr. egg station and return. At Hot Cr. hatchery set up photographic aquarium for test shots of male and female BT in breeding colors. Although reflections from 10:30 a.m. until noon, severe, they seemed not to cast disturbing elements into ground glass image; therefore, it may be fully possible to photographic very well the inland water fish forms without light polarization. Returned to Rush CR. where test shot was made of LL.

TUESDAY Oct 17, 1939 (Kirman lake)

Fern Cr. to Carmen L. and return. At Carmen L., with Lenn Talbott, hauled seine on Eastern Brook trout close inshore in spawning activity. Helped Talbott sort males and females. Made photographic set-up and took two test shots of EB in brilliant and beautiful breeding colors. Returned to hatchery at Fern Cr. "This was fine brook stock of well-colored Ad EB (& two angling [illegible]

WEDNESDAY Oct 18

At June L., following correspondence, checked catches throughout the day. Fishing has picked up considerable the past several days and trollers are still leading in catch returns. Checked catches on Reverse Cr. where city employees from shaft #1 are every day "pounding" the little stream just planted, taking out the small hatchery fish. Most of these caught are 3 to 4 inches long.

(OVER)

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HATCHERY June Lake, California DATE October 22, 1939

SUNDAY Oct 22, 1939 (Give date)

At Rush Cr. Egg Coll. Stat. re-photographed Lake and female Loch Leven taken from trap, returning to June L. met Burton Frasher (Frasher's Fotos Inc.,) to review some Kodachrome transparencies with varied exposure formulae. Checked catches at Garth and Brinley piers until evening.

MONDAY Oct 23

During forenoon, tabulated data from catch records booklets at piers on June L. Remained at June Lake in afternoon and checked [illegible] creels. A high and cold wind forced most anglers off the lake in the late afternoon. A gill net, set on Gull L. shortly after sunrise, was hauled at sunset, and scales measurements and stomachs saved from KB caught.

TUESDAY Oct 24

Cold, high wind barred angling on June L. today; a snowstorm beginning at noon by evening had coated the ground to a depth of 4 inches. During the day the Fern Cr. cabin was cleaned and firewood, to supplement that used by me, slabbed off and split up. Additional equipment to be taken to Mt. Whitney on Monday was segregated and packed.

WEDNESDAY Oct 25

Throughout day continued and completed series of stomach analyses and recorded stomach data from June L. rainbow material taken in July.

(OVER)

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

Fishculturist's Weekly Report

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HATCHERY Biological Survey, Gerberville DATE November 11, 1939

SUNDAY Nov 5 *(Give date)*

Day off.

MONDAY Nov 6

In Richmond, continued calculation ofcondition factors on marked trout returned from June Lake. Tended to correspondence.

TUESDAY Nov 7

Richmond to S.F. office and return. At San Francisco office, continued and completed calculation and summary of condition factors on marked trout from June Lake.

WEDNESDAY Nov 8

Richmond to S.F. office and return. At San Francisco office summarized by months catch record data for Gerth pier from June Lake season 1939. For remainder of morning through noon until early afternoon, obtained bids on Ford V8 3002 preparatory to trading the automobile in. Following conference with Mr. A.C. Taft and Mr. A.E. Burghduff, returned to Richmond. In evening discussed program for season at Benbow Dam with Leo Shapovalov.

CC-158

(OVER)

THURSDAY March 7

In the morning reviewed publications received from the Division library at S.F., and prepared correspondence. Occupied the afternoon in editing and re-typing portions of the June L. ce creel census report.

FRIDAY March 8

Prepared correspondence. Remainder of day taken to type and complete final copy of June L ke creel census paper.

SATURDAY March 9, 1940 (Note wintry conditions with mercury at zero A.M.)

Mt. Whitney Hatchery to Fern Cr. Hatchery to June Lake to Grant Lake Aqueduct and Grant Lake and return to June Lake. At Fern Cr. Hatchery still about 12 to 14 inches of snow on road and bridge. Examined part of Grant L ke-Mono Tunnel Aqueduct near where this structure crosses highway 395. Above Cain Ranch, diversions fro.. Grant Lake outlet pouring water at this time out into Mono Basin; one diversion was flo.. 5 CFS. At Grant Lake all but 25 acres of ice gone and lake within 4 ft. of overflow; temperatures taken and outlet stream est. at 50 CFS. At June L. photographed lake in winter condition, took ten creat.res, examined gravel beds for early spawners and saw one. Ice on lake gone from large sectio.. at upper (North) end and in places around the shoreline; if mild weather continues for another week ice will be entirely gone from lake.

RECAPITULATION

ND EGGS Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

00 170

55575 12-38 SP.
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DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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HATCHERY ~~June Lake, California~~ DATE ~~March 31, 1940~~

SUNDAY ~~March 24~~ *(Give date)*

Drew gill net and took measurements, scales, and stomachs of Eb and Rt caught. Re-examined lower Rush Cr. and diversions. There is now about 10 CFS flowing in lower Rush Cr., beyond the diversions and probably about 60 CFS distributed out over MONO basin. Apparently the D of W & P will try to reduce Grant Lake before the bids are opened April 5 for the construction of the dam. Examined Grant L. (now entirely free of ice) and took temperatures. Examined Rush Cr. at egg collecting station and at L.A. Venturi Weir (est. 50 CFS flowing passed weir). Only a small part of Silver L. open at outlet at south-facing side of lake. In late afternoon again drew gill net on June L. and took scales, measurements, and stomach samples from the trout caught.

MONDAY March 25

Cleaned gill net and spread same to dry. Rowed to spring near residence area in east arc of lake to examine gravel beds for spawning fish, but saw none. Until 11:30 a.m. made re-census of trout on Reversed Cr. to check areas covered on Saturday; count fell considerably short of that obtained on Sat., probably affected by scared condition of trout. Examined outlet stream into Gull L. and again saw small Eb of year in marginal shallows. Replaced screen over culvert at outlet of June Lake, torn loose by ice during winter. Tended to correspondence and prepared weekly report. Bound and re-packed gill net.

TUESDAY March 26

June L. to Hot Cr. Hatchery to Long Valley Dam to Bishop to Independence to Mt. Whitney Hatchery. Stopped at Hot Cr. Hatchery and returned seine borrowed from Mr. Lewis for trout census on Reversed Cr. Stopped at Long Valley Dam and noted progress(?) on structure, which is now about two-thirds complete. Workmen were scarifying the bluffs on either side in preparation for the two end parts of the dam. In Bishop, conferred with Mr. L.L. Tatum on possibility of a high lake creel census the coming season. Interviewed Dr. C.W. Anderson (Rainbow Angling Club) on results of ballot enquiry on fish and game propositions among the Inyo-Mono Assoc. Stopped at Independence for mail and returned to Mt. Whitney Hatchery.

WEDNESDAY ~~March 27~~, 1940

~~Tended to correspondence in morning and conferred with visitors~~ (student of Dr. Eliot Blackwelder at Stanford University studying geological effects of L.A. Aqueduct on Inyo-Mono). Remainder of day occupied in study of papers on glaciation of the Mono and Walker basin areas sent by Dr. Blackwelder from Stanford University.

(OVER)

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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HATCHERY He reported at June Lake, California DATE April 6, 1940

SUNDAY March 31 *(Give date)*

Day taken off.

MONDAY April 1

~~Tended to correspondence in the morning and early afternoon. Reviewed current literature in fish and game management received. In the evening went to Fern Cr. Hatchery and at the request of Mr. Mc Cloud directed Asst. Warden Attwood to Hot Cr. Hatchery to assist Mr. Clarence Elliger, Hydraulic Engineer of DF&G.~~

TUESDAY April 2 Silver L. free of ice by middle last week in March.

~~At the upper end of June Lake examined gravel for spawning RT. Over one area est. 150 ft. square, counted 19 trout 7 to 20 inches in spawning activity; at least 4 of the trout were 14 inches or over. (Air: 46.6; W. 45.~~ examined aqueduct and diversions from Rush Cr. below Grant L. dam; examined shoal and gravel areas in Grant L. for spawning RT and took temperatures. Silver L. now open (opened middle of past week). Stopped at Fern Cr. H. for fall net brought from Mt. Whitney Hatchery. Unloaded equipment at Gull L. residence.

WEDNESDAY April 3

~~June L. to Thompson and Arcularius Ranches on the upper Owens River, and return. Divided upper river area into sections and began visual census of trout in the river starting at dam on Thompson Ranch. By 3p.m. forced to quit because of poor visibility created by cloudiness and high wind along river. On returning to June L. tended to correspondence for remainder of day.~~

(OVER)

00 127

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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HATCHERY June Lake, California DATE April 21, 1940

SUNDAY April 14, 1940 (Give date)

Day time off.

MONDAY April 15

At Leevining Ranger Station, interviewed District Ranger Inyo Nat'l Forest regarding concession permits on June Lake this year; boat limitations are to be set at 60 commercial boats and 40 private boats on the lake. On return to June Lake tended to correspondence and wrote report on trout census made on upper Owens River through Thompson and Arcularius Ranches.

TUESDAY April 16

Tended to correspondence and reviewed current literature in fish and game management received. Checked through figures stored in trout census on Owens River and corrected several errors in notes and weekly report for week ending April 13. Made corrections in script of report re comments to Bureau Office.

WEDNESDAY April 17, 1940

In Leevining, had car 53543 serviced and checked over, following trip to Owens R. [Until mid-afternoon examined Rush and Parker Creek diversions in Mono Basin, mainly above Highway 395, following reports of stranded trout in stream beds from which water recently diverted by stockmen. Returned to June Lake and typed final copy of trout census report to Bureau Office. 36

60 181

(OVER)

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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HATCHERY ~~June Lake, California~~ DATE ~~April 29, 1940~~

SUNDAY ~~April 21~~ *(Give date)*

~~Day taken off duty.~~

MONDAY ~~April 22~~

~~Tended to correspondence and reviewed current literature in fish and game received. For the remainder of the day, traced carbon copies of Rainbow trout used for posters at June L. and prepared posters for the coming season's catch record survey; began the printing of one by hand type.~~

TUESDAY April 23, 1940

Tended to correspondence. June L. to Leavining canyon and to canyon below Simpson mine and return. Investigated intense mining pollution in Leavining Cr. reported by interested persons in Leavining; the stream coming from the Simpson mine near Leavining Peak was found to be the main channel for the tailings from the mine. The detritus was so heavy in the water that a small bit of solution held in the hand completely obscured the palm. The stream was flowing about 4 CFS with a water temperature of 43.0 degrees. The unbounded silt empties into lower Leavining Creek near the

WEDNESDAY April 24, 1940 Leavining Ranger Stat.

On vacation leave.

Left my Station for Los Angeles + So. Calif

SR: HP 10 183

(OVER)

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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Began residence at Gull Lake w/ Ethel

HATCHERY June Lake, California DATE May 5, 1940

SUNDAY April 28 *(Give date)*

On vacation leave.

09 185

Retirement June 1.

MONDAY April 29

Typed up accumulated correspondence and prepared weekly report. Completed painting and labelling of posters to be used in creel census at June Lake. Reviewed literature in fish and game received.

TUESDAY April 30

Drove to Hot Cr. and examined sections of stream from Chance Place to mouth of gorge below Waterson's. For some unknown reason there are very few brook in the stream this year; counts at Waterson's over a section 1000 feet long showed a ratio of 3 brook trout to 5 linear feet of stream. Visited Hot Cr. Hatchery and conferred with Messrs. McCloud and [illegible] Grant L. relative to [illegible] correspondence and monthly reports.

WEDNESDAY May 1

Note catch information from lower Rush Cr.

Until early afternoon, checked vailable catches from Rush Cr.; and Grant L.; lower Rush Cr. below Grant L. did turned out some very good trout (LL an RT up to 8 inches long) and Grant L. was fair until strong winds appeared; at 11:30 a.m. drove waters from the lake, returning to [illegible] It was not entirely a surprise on May 1.

(OVER) [illegible] of the lakes and streams open

[illegible] winds [illegible]
Drive [illegible] the [illegible]

THURSDAY May [illegible]

Again, for most of the day, checked available catches from Kush Cr., Grant L., and Gull L. Winds of high velocity ([illegible] m.p.h.) very early drove most anglers from Grant and Silver Lakes, and boat operators would not allow their boats to go out. The closure of Reversed Creek is keenly felt in the Area and the general opinion is that it should be re-opened as soon as possible.

FRIDAY May [illegible]

[illegible] correspondence and revel of survey, fish and game literature most of day [illegible] duty. [illegible] today many anglers are [illegible] the first three days fishing.

SATURDAY May [illegible]

From [illegible] a.m. until 7 p.m., checked creels at [illegible] Lake in starting the 1940 creel survey there. Despite high wind in the morning anglers caught plenty of trout--numbers of large males and females [illegible] in spawning color, and numbers also of Eastern Brook in excellent condition. Independent counts by Warden [illegible] and myself showed a return of between 1156 and 1200 trout taken. At 3p.m., there were 77 boats out and 159 persons fishing, or 2.07 persons per boat; the figure does not include shore fishermen. Approximately 84.4% of the return were marked trout of the 1939 plant from Hot Cr. Hatchery.

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

00 186

[SIGNED] ____________________

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THURSDAY May 1949

Gull L. to June L., to Leevining Cr., to lower Rush Cr., to Grant L., to Silver L., to June L., and return to Gull L. Examined Leevining CR. from ranger station to below power house in Leevining, and although stream still very murky from mining debris it is by no means as heavily discolored as when seen a week ago; local anglers have contended that lower Leevining Cr is one of the best trout sections in the canyon. Examined lower Rush Cr. at Dombrows tie place and at intervals to Highway 395. At Grant L., work on new dam progressing rapidly and on on new highway on west side of futur reservoir. Few use of wind, few anglers were seen in the area and along the shore. In return to Gull L., stopped at June L. postoffice.

FRIDAY May 13

Tended to correspondence and typed catch record forms for use in creel census at June Lake. Reviewed literature in fish and game received.

SATURDAY

Obtained help at Gull L. Spike Camp for June L. creel census and at June L. from 0800 a.m. until 6 p.m., checked creels from the lake. Took quantity of scales from an angler's catch to Farm Cr. Hatchery. Returned CDA men to Gull L. Spike Camp.

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND
		00 188						

[SIGNED]

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HATCHERY June Lake, California DATE May 29 1940

SUNDAY May 12 (Give date)

Drove to [illegible] Camp and their ERA men assigned by Forest Service to assist in creel census at June Lake and with them checked creels from 9 a.m. to 7 p.m. Returned to ERA camp; totalled catch records for the weekend and found that less than half the estimated total catch for the opening weekend was returned. The total estimated catch was 1330 trout weighing 0.81 lb. Returned

MONDAY May 13

Day taken off.

TUESDAY May 14

[illegible] June Lake to Little Walker Lake [illegible] Lee Vining [illegible] Walker Lake. Drove [illegible] and following preliminary [illegible] for [illegible], set gill net at 12:45 on [illegible] the Whitney [illegible] lake [illegible] and [illegible], trolled [illegible] and [illegible] tended to correspondence [illegible] for [illegible] supplies.

WEDNESDAY May 15

At 6:30 a.m. drew gill net and found 13 Eastern Brook [illegible]. Re-set net in five separate [illegible] with plankton [illegible] June Lake made a preliminary haul over a surface course of one-fourth mile; took stomachs and preserved, scales and measurements and generally examined fish specimens taken. In the evening examined plankton samples under microscope.

[illegible] - 89

(OVER)

Little Walker: 93.3 acres
36 ft deep
1945 AF

THURSDAY May 16

Drew gill nets and found the Eastern Brook [illegible] (net had set 14 hours). Took stomachs, scales, weights and measurements from the specimens (trout). The trout, apparently all in good condition, varied from 6 to 12¼ inches, with an average length at 8.1 inches. The average weight appeared to be 7½ [illegible]. Took soundings of lake along length and width of lake and stepped full shore distance; Little Walker is evidently 93.3 acres in surface area and has a maximum depth of 36 ft. 6 inches. The volume was calculated at 1945 acre feet.

FRIDAY May 17

Again examined [illegible] and made a second [illegible] over a course of half mile; [illegible]. Returned to clean cabin, washed car 53543 and left for Bull Lake. Tended to correspondence and took remainder of afternoon off duty.

SATURDAY May 18

Patrolled ERA [illegible] & Bull Lake [illegible] and checked [illegible] at [illegible] Lake from 8 a.m. until 6:15 p.m. A miserable wind from the north all day made the lake choppy and fishing mediocre; only the best anglers and those who from previous experience "knew the spots" caught fish. Returned ERA [illegible] to camp at end of day.

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

00 190

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DIVISION OF FISH AND GAME

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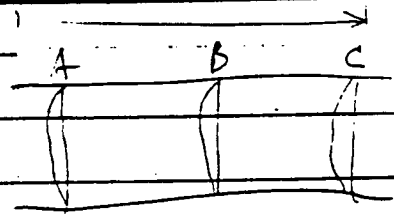
HATCHERY June Lake, California DATE May 27, 1940

SUNDAY May 1, 1940 *(Give date)*

Outlined EM men at Gull Lake Spike Camp and with these men checked same on from 8:30 a.m. until 7 p.m. Fishing was generally slow all day and consecutively few trout were returned. At 9:30 a.m. there were 99 cars and 113 persons on the lake. Returned EM men to Gull L. camp.

MONDAY



Lay in bed off duty.

AU width x Av Depth = 20' x 0.8
0.5
16.0
5
80.0 .9 = 72

TUESDAY

Laid in bed off duty. In the afternoon tended to correspondence and made out reports in which no fish were received.

WEDNESDAY

Drove to Mt. Whitney Hatchery and visited hatchery and obtained set of Kamloopic and photographic aquarium for use at June Lake headquarters. On return, examined Division Creek above power house and obtained two flies and bad battery in car which checked over in Bishop.

191

(OVER)

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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HATCHERY June Lake, Calif. DATE June 9, 1940

SUNDAY June 2, 1940 *(Give date)*

Obtained ERA (emergency relief administration, a sub- of WPA) help at Gull Lake spike camp and with them checked creels at June Lake ~~throughout~~ the day. Returned ERA men at close of day to camp. In the evening wrote up some notes taken at Little Walker Lake and tended to correspondence.

MONDAY June 3,

Obtained ERA help at Gull Lake spike camp and started them in checking of creels at June Lake. Most of the day taken off duty. At close of day returned ERA men to camp. Tended to correspondence. Part of afternoon required to examine and kill deer injured on highway into June Lake; Turned animal over to local wardens for distribution.

TUESDAY June 4

Obtained ERA help at Gull Lake spike camp and directed them to check creels at June Lake during the day. Drove to Bridgeport and thence down East Walker River as far as the State line. In return examined side streams and river itself at intervals to Sweet Water Reservoir. Drove to Green Creek and examined creek at Power house. Returned to June Lake and en route examined Dog Creek in three places. At close of day returned ERA men to camp.

WEDNESDAY June 5

Obtained ERA help at Gull Lake camp and directed them to check creels at June Lake during the day. Half of day taken off. Met Dist. Biologist Brian Curtis and conferred with him during early afternoon. Soaked plankton net and made sample haul in June Lake with Ekman dredge; examined bottom samples. At Close of day returned ERA men to camp.

195

(OVER)

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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HATCHERY June Lake, California   DATE June 16, 1940

SUNDAY June 9 (Give date)

ERA men assisting on June L. creel inventory were obtained from their Gull L. Camp and checked catches throughout the day; at the close of the day the men were returned to the Gull L. camp. In the afternoon examined the east shores of Grant L. where literally thousands of chub minnows (Siphateles obesus) 1 to 2½ inches long were observed in the marginal water. In the evening drove to Hot Cr. Hatchery and borrowed a hand seine from Mr. Lewis and conferred with him further on the proposed marking of RT.

MONDAY June 10

Obtained ERA assisting in June L. creel census project and directed them to check catches throughout the day. Drove to Sonora Pass and in return examined a number of the upper tributaries of the West Walker R. down to Pickel Meadows, for stranded trout. At Pickel Meadows 17 young trout, 1¼ to 1 3/4 inches long, together with many pollywogs, were seen in side-water (70 degrees F.), but none observed stranded, nor did residents at Leavitt Meadows know of any occurrence of stranded fish. On return examined Green Cr. at two places below the Green Lakes Camp. Returned ERA men to camp. In the evening returned hand seine to Hot Cr. Hatchery.

TUESDAY June 11

Obtained ERA men at Gull L. Spike Camp and directed them to check catches at June L. throughout the day. Tended to correspondence. Half of day taken off duty. Returned ERA men to camp.

WEDNESDAY June 12

Obtained ERA men at Gull L. Spike Camp and directed them and assisted them in checking catches at June L. throughout the day. Drove to upper end of June L. and interviewed and checked creels of anglers on north shore. Returned ERA men to camp at end of day. In the evening conferred with Mr. Nate Milnor at his residence on Silver Lake.

197

(OVER)

THURSDAY June 20 [illegible]

Marked (VV) and preserved samples of rainbow trout for display at June Lake. Cleaned and repacked marking equipment. Tended to correspondence. At June Lake checked catches until late afternoon; assisted in planting final allotment of trout to June Lake. Returned fish can and aerator to Hot Creek Hatchery and obtained summary of planting data from Mr. Lewis; experimental group of trout averaged 1.3 per ounce. At Mammoth camp completed report of work progress of try-C boys in my charge. Returned to Gull Lake.

FRIDAY June 21, 1940

Gull Lake to Bishop to Sabrina and North Lakes to Bishop and returned to Gull Lake. Examined upper Bishop Creek below Lake Sabrina; Took temperatures and examined part of Lake Sabrina. Interviewed Mr. Hobsen of Lake Sabrina Camp, regarding higher lakes in North fork of Bishop Creek Basin. Examined Lallarck Creek above Marion Lake and North Lake. In Bishop, had car 5543 serviced and checked over also obtained supplies. Returned to Gull Lake.

SATURDAY June 22

Tended to correspondence. Prepared portable tank for new Derris root experiments. At June Lake checked and recorded catches and took and recorded weights and measurements from marked trout returned from the lake. During past several days of warm weather, fishing has been described as "slow"; anglers are attempting to fish deeper into the colder water levels. Near the close of day drove to Grant lake and examined progress in the construction of the Grant Lake dam; Returned to Gull Lake.

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

10-200

[SIGNED] _____

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THURSDAY July 4

Checked creel from anglers returning from June Lake at boat landings t
t roughout the day and took scales and measurements from marked trout
appearing in catches. In the mid-afternoon took three plankton sampl s
at the surface zone of water at three stations in the lake. Divisions
visitors at the lake during the da included Theodore Coul Ed ns and Jame
Loundagin.

FRIDAY July 5

Tended to correspondence. At June Lake continued checking of angler's
catches at boat landings and measured and took scales from marked trout
available. For a brief interval during the early afternoon visited
Fern Cr. Hatchery; on return to June Lake examined upper section of
Reversed Cr. from Gull L. Station to first meadow.

SATURDAY July 6

Throughout the day at June L. checked anglers creels at boat landings
and took scales and measurements from marked trout available; angling
returns tended to pick up today with several couples returning from the la
with near limits including more larger trout from the 1939 plant. Began stud
of I.C. Russell's "Quaternary History of the Mono Basin" in geological repor
borrowed from Mr. Thomas McKee. Conferred in the early evening with Mr.
McCloud regarding the proposed experiment on Gull Lake.

RECAPITULATION

FISH AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

204

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DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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HATCHERY June Lake, California Date July 14, 1940

SUNDAY July 7 *(Give date)*

At June Lake continued creel census and took measurements, weights, and scales from all marked trout available. Continued study of I.C. Russell's "Quaternary History of the Mono Basin" and perused literature in fish and game received. In the evening drove to Hot Cr. Hatchery and borrowed 30 ft. seine for netting of chubs from Gull L.

MONDAY July 8

Most of day taken off duty. In the afternoon distributed jars of samples of 1940 marked trout to boat piers on June Lake.

TUESDAY July 9

In the morning seined samples of chubs of two sizes from Gull L. and took them to Fern Cr. Hatchery for holding; returned 30 ft. seine to Hot Cr. Hatchery. At Convict Cr. Exper. Stream weighed up samples of derris root for experiments and conferred with Dr. H.S. Davis on action of derris and effect of certain other chemicals on Ichthyopthirius. It was the opinion of Dr. Davis that derris root would have little effect on this cili parasite; discussion was held regarding speed of action of derris at different temperatures. Returning to Hot Cr. Hatchery took water samples for parasite analysis and discussed eradication measures with Mr. Lewis.

WEDNESDAY July 10

Practically entire forenoon and part of afternoon required to filter and examine samples of water taken at Hot Cr. Hatchery for free-swimming and encysted stages of Ichthyopthirius. Continued creel census at June L. in the afternoon and reviewed biological literature received; tended to correspondence.

(OVER)

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

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HATCHERY June Lake, California DATE August 4, 1940

SUNDAY July 28 (Give date) *Louis [illegible] fire! [illegible]*

Tended to correspondence and until mid-afternoon continued checking of angler's catches and the measuring and taking of scales samples from marked and unmarked trout returned from June Lake. From mid-afternoon until evening, joined Forest Service men and residents in fighting severe blaze just north of Gull Lake. Fire was controlled just before engulfing residential district on west end of June Lake.

MONDAY July 29

Continued registration of angler's catches and the taking of scales and measurements from marked and unmarked trout from June Lake. In the afternoon, [illegible] from lake, drove to Gull Lake guard station and examined outlet flow of Gull L.; the flow is now about 110 c.f.m. and the lake appears to be dropping [illegible] rather steadily. Also examined map of Gull Lake at guard station drawn by a Forest Service official.

TUESDAY July 30, *1940*

Obtained boat and oars from Cherokee Lodge and began detailed re-sounding of Gull Lake in the morning; work carried for and until noon. Then brisk wind made maneuvering of the rowboat and the taking of soundings difficult. In the afternoon, drove to Grant L. and lower Rush Cr., stopping to examine flows in Reversed Cr., Rush Cr. at the L.A. Venturi weir, examine construction progress on Grant L. dam, and examine flows and condition of lower Rush Cr. Much of the new diversion from Leevining Canyon to the Mono Aqueduct is completed.

WEDNESDAY July 31 *Soundings at Gull L. — max 61 ft AV 37½ ft*

In the morning, during calm on the lake, completed soundings on Gull L. and totalled and averaged figures; in the series the maximum was found at 61 feet and the average depth at 37½ feet. Tended to correspondence and part of monthly reports while continuing the June L. creel census for the remainder of the day; most anglers reported that fishing was "better", but said that it could still pick up plenty to be called "good".

00 211

(OVER)

THURSDAY Aug 15

forenoon, at June Lake [illegible] census, recording catches and taking scales and measurements from marked and unmarked trout returned. In the afternoon, drove to Independence and obtained second sample of Bisby powder for tests, from supply stored at Mt. Whitney Hatchery. In return, stopped at Tinnemaha Dam to investigate report of fish dying below the dam; catfish were found dying in small numbers from a skin disease resembling furunculosis. Had oil changed in car

FRIDAY Aug 16

Took scales and measurements from marked and unmarked trout returned. Large numbers of marked trout of the 164 series from [illegible] continue to appear in catches. In mid-afternoon, using a brush hook, loaned by [illegible] Service to clear [illegible] path through reeds for boats in Gull Lake; in places the reeds are so dense and interwoven that the margi lake can be [illegible] completely obscured.

SATURDAY Aug 17

Took scales and measurements from marked and unmarked trout returned. For [illegible] afternoon, drove to Rush Cr. and [illegible] Venturi weir and examined stream bed for Lahontan Cutthroat reported to be migrating. None were seen, however, after careful search from Rush Cr. [illegible] Taking Station to mouth ½ mile above the weir.

RECAPITULATION

...AND EGGS (Variety)	FROM	PREVIOUSLY REPORTED	TAKEN OR RECEIVED	LOSS	NUMBER PER OUNCE	NUMBER OF OUNCES	NUMBER SHIPPED	BALANCE ON HAND

00216

[SIGNED]

14873 12-38 SW.
STATE PRINTING OFFICE

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

FIELD CORRESPONDENCE

FROM: Elden H. Vestal PLACE June Lake, California

TO: Bureau of Fish Conservation DATE June 30, 1939

SUBJECT: Monthly report for June 1939

Throughout the month the creel census work on June Lake was continued with the assistance of tri-C boys obtained from the Gull Lake spike camp. The boys have been rather carefully selected and seem to be well adapted to the work. Records are daily kept at the two principal piers on the lake in the marine catch record booklets, which have been adapted to the survey on the suggestion of Mr. Taft. Following the July 4 holiday, which is practically a mid-point in the season, records will be summarized for inclusion in the next monthly report.

Each day, with several exceptions, in the period June 1-18, after taking the tri-Cs to the lake and getting them started in the registration of catches, the main part of the day was occupied in preparation of a manuscript for the American Fisheries Society meetings in the last of the month. This was completed June 18.

On June 6 and 14 trips were made to Bishop largely to service V8 5952. Although the care is in need of several large repairs, such as renewal of the intermediate gear (the slipping out of the 2nd gear has twice nearly caused a bad accident on steep grades), grinding of valves, possibly installation of oversize pistons and new rings, reline brakes, and a new tire, it was deemed unwise to undertake anything but the most needed and least expensive repairs in view of a contemplated change of the car by the Bureau.

On June 13, a pack trip was made with Mr. Slim Tatum, packer at June Lake, Leon Talbott, and others to higher lakes in the Rush Cr. drainage for acquaintance with this area and to assist in the planting of the Eastern Brook trout assigned. Examinations and photographs were made of the stream (Rush Cr.) above and below Waugh Lake. Above the Lake at Rush Meadows, the Southern Sierras Power Company was accepting about 90 CFS (Temp. 58.0 F) but allowing only about ½ CFS (temp. 64.0F) to flow into Rush Cr. below Waugh Lake for 2½ miles of excellent trout stream. Following the trip, arrangements were made with Mr. Killian, superintendent of the Power Company, for at least 5 second feet to flow in Rush creek at all times.

Arrangements were made June 17 with District Ranger Fisher at Leevining for the tri-C boys assisting in the creel census work on June Lake to stay at the Gull Lake guard station in my absence during a trip to Humboldt County. This was done to obviate a transportation problem to June Lake for the boys during this time.

June 19-24 was occupied in a trip to Garberville, Humboldt County, for additional information on the feeding habits and population of American mergansers in the South Fork of the Eeel River. The principal

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

FIELD CORRESPONDENCE

- 6 -

PLACE

DATE Sept., 1940

OM:

C

JECT:

Sept 21, 1940
Bridgeport & Twin Lakes
Grant Lake

c. An observational trip was made to Rush Cr. and Grant Lake dam on Sept. 21; along lower Rush Cr., large tracts of tamarack and beautiful aspen groves are being ripped out by the work of bulldozers now at Grant Lake will back up later into this one time beautiful camping area.

d. On Sept. 26 a trip was made to Twin Lakes above Bridgeport and a gill net set in the upper lake. Marginal areas were carefully examined for inlet streams and beds of aquatic plants; the dams at outlets of both lakes and outlet control mechanisms were examined. In the mid-afternoon, the gill net was drawn after having set for 6 hours and 7 chubs (Siphateles obesus) and 2 suckers (Catostomus arenarius) were obtained.

e. On Sept. 29, budgets for the biennium July 1, 1941 to July 1, 1943 were completed and submitted to the Bureau office.

Miscellaneous Activities:

1. Considerable amounts of time during the month were taken in official correspondence and review of biological and fish and game literature received.

2. Publics received during the month were acknowledged.

3. Copies of J.O. Snyder's "Trouts of California" were distributed to volunteers in the Bull Lake Project.

Edward A. Strand

District Biologist

U9 256

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

FIELD CORRESPONDENCE

FROM:

TO:

SUBJECT:

PLACE

DATE Nov. 2, 1940

completed and in operation.

During the later stages in the refreshening of Gull Lake, especially on calm days, a rich green bloom appeared on the surface in certain areas, depending on the direction of the wind. Close examination revealed the material to be decomposing particles of algae under which would gather in a raft-like mass of about 5 acres in extent at the surface and float about the lake. When a wind of moderate or high velocity churned the lake, the material would be widely dispersed about the entire lake in its upper strata.

B. Minor Activities:

1. On Oct. 8, in return from a conference with Mono County Supervisor Walter Dombrowski, at Mono Lake, routine observations were made at Grant Lake dam and along Rush Creek. On the same day a 50 foot seine was returned to Hot Creek Hatchery.
2. A semi-annual conference of the Inyo-Mono Association was attended at June Lodge, June Lake, on Oct. 10.
3. Most of Oct. 16 and 18 were taken at Carmen Lake and Rush Creek Egg-taking Stations in color photography of Eastern Brook and Loch Leven trout.
4. A trip to Bishop was made on Oct. 17 for additional cement for the Gull Lake check dams. At the same time the State car assigned was serviced, lubricated, and otherwise checked over.
5. On Oct. 24 part of the day was taken to consult and repair the aquarium used in color photography of trout.
6. Parts of ten days during the month were taken in official correspondence and review of biological and fish and game literature.
7. Trips were made on Oct. 9,10, and 11 for experimental series of Eastern Brook trout for use at Gull Lake.

District Biologist

HA 268

Nov 1 — Monthly field report; helped plant Gull L.
2 — helped plant Gull L.
3 — Corres. Fishing & [illegible] line-cone; helped plant Gull L.
4 — Gull L. plant completed (76,200 at 1.1 per ounce)
5 — Exam. [illegible] areas on Gull L.; obtaining stat. data, [illegible]
6 — " " of " " "; [illegible] catch [illegible] from [illegible] for 19[illegible]
7 — Corres & lit; cont'd & compl. [illegible] of catch [illegible] [illegible]

Major activities

1. [illegible] creel ~~[illegible]~~ 1, ~~[illegible]~~ 5-7, 8,

2. Gull L. 1-4, 5-9, 10, 18, 20,

Minor activities — misc. & office work

1. Corres + lit. 1-2, 3, 6, 10, 23,
2. Observations to [illegible] & [illegible]. 5, 20,
3. Vacation ~~[illegible]~~ 11-17 incl.; (interim [illegible] of Gull L.); 25-30
4. Location of ~~[illegible]~~ + lake 18, 19, 22,

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

Fishculturist's Weekly Report

Gull L. tested 9/11/40
Restocked w/ EB 11/4/40

INSTRUCTIONS FOR MAKING THIS REPORT

At the end of each week forward a concise report of the official duties performed during the week. State condition of the weather, number fish taken, spawned, etc., and any items of interest connected with the work.

HATCHERY June Lake, California DATE November 10, 1940

SUNDAY November 3, 1940 (Give date)

Tended to correspondence. With Mr. Burton Frasher Sr., from Pomona, Calif. examined bottom and marginal live-cars and principal parts of the shore-line while he, at intervals, took movies to add to his already valuable and interesting reel on the Gull Lake project. Remained on hand to assist J. H. Cook from Hot Creek Hatchery unload large can truck with trout for Gull Lake. — photo of Harry Cook unloading cans of EB for Gull Lake

MONDAY November 4

Day taken off duty. Re-stocking of Gull Lake completed by late afternoon with last of 76,200 trout, including 4 experimentals released from one of the live-cars, averaging 1.1 per ounce. Examination of live-cars at margin and bottom late in day showed all controls still lively and apparently in first- rate condition.

Cost/76,200 trout (total)

TUESDAY November 5, 1940

Early in morning, with Gull Lake calm, examined marginal areas for presence of newly planted trout; especially near Gull Lake camp ground trout were seen rising to feed. Half of day taken off duty. Obtained boat records from June Lodge for Sept and Oct. and tabulated same; returned same at end of day. During observ. trip to Rush Cr. and Grant Lake dam took photos of Grant Lake dam and clearing of trees etc. at inlet delta area

WEDNESDAY November 6

Examined marginal areas of Gull Lake and live cars and found all satisfactory so far. Until mid-afternoon, filed pamphlet and other biological literature on hand; packed books and periodicals; cleaned optical equipment and surgical instruments. Tended to correspondence and began grouping by concessions and chronologically catch record forms from June Lake, season of 1940.)

DD 270

(OVER)

June Lake, California November 24, 1940

Nov. 17

On vacation leave.

Nov. 18

Together with Carleton Rodgers, examined check screens and dams above and below Gull Lake; examined marginal areas and observed recently planted Eastern Brook trout feeding here and there around the lake. Following correspondence and review of recent biological literature received, obtain location of lakes and streams needed to complete Bureau index for Inyo-Mono.

Nov. 19

Turned to correspondence. Continued location and listing from U.S.G.S. and outing maps available of lakes and streams needed for completion of Bureau index for Inyo-Mono.

Nov. 20, 1940

Examined and cleaned check screens above and below Gull Lake; as the lake raises the green "flower" of decomposing timbo border is moving through the outlet and down Reversed Creek. In Lovining, had defective Ford battery checked and serviced; battery housing has torn loose one cell inside box and will need replacement. Returning via Grant Lake dam, examined progress in construction; dam is nearly complete and lake is raising rapidly. Workmen have heavily muddied the entire lake. At L.A.-Venturi weir observed Loch Leven above the weir lately released from the Rush Cr. trans.

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

FIELD CORRESPONDENCE

FROM:

TO:

SUBJECT:

PLACE

DATE Nov, 1940

2. Two observational trips were made to Rush Creek and the Grant Lake basin on Nov.5, and 20. Photos were made of the new Grant Lake dam and of the arboreal carnage from clearing operations in the upper section of the basin, particularly along Rush Creek for a half mile below the egg-taking station. At this writing, the dam is completed and Grant Lake is raising rapidly. According to an engineer in the employ of the Dept. of Water and Power all construction buildings and housing are to be moved from city property by Jan. 1, 1941.

3. A number of streams and lakes required to complete the Bureau index for Inyo-Mono were located and listed by township, range, and section from U.S.G.S. and outing maps available on Nov. 18, 19, and 22.

4. Eleven days vacation leave were taken from Nov. 11-17 and from Nov. 25-30.

District Biologist

DO 279

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

FIELD CORRESPONDENCE

FROM:

PLACE

TO:

DATE June 1, 1942

SUBJECT:

better had not high winds hindered fishermen.

2. On May 6 a trip was made principally to Mammoth Lakes, Convict Creek, Convict Lake, and Hot Creek, and from all places visited the report was made that opening of the season trout fishing was poor. Only two limits were known from the reknown Hot Creek on the opening day.

3. On May 9, a trip was made to Leevining Creek and return to June Lake via lower Rush Creek and Grant Lake Basin. The mining pollution earlier reported in Leevining Creek was still intense, but by no means as heavy as when previously seen on April 23rd, Lower Rush Creek, Grant Lake and the weir on Rush Creek were examined.

4. On May 22, a visit was paid to Mt. Whitney Hatchery and some formaldehyde and the aquarium for trout photography were obtained. During the return to June Lake, Division Creek above the power house was examined; some supplies were obtained and a defective battery was checked.

5. On May 24, a quantity of stomachs from June Lake Rainbow Trout taken May 11 were analyzed and items found therein recorded.

6. Following a report by Webb Talbott, report in turn received from an employee (one Mr. Paul Mullen) in Bishop Postoffice, a trip was made on May 28 to Horton Creek Basin where a disease has broken out in particularly the trout in the lakes. Dull grayish white patches of fungus were observed on an occasional Rainbow Trout in eddies and more quiet water in the stream, but no trout in faster water was seen infected. The Eastern Brook Trout seemed unaffected. The difficulty of the trip for one day obviated the collection of specimens. It is planned to make further observations a month from now to note any change in the fish.

Miscellaneous Activities:

1. Official correspondence was prepared and literature in fish and game management was reviewed at various times during the month.
2. Several supplies were received during the month from the Bureau office and the same acknowledge.

3. An Ekman Dredge, soil sieve, and solid messenger were received from District Biologist Brian Curtis.

4. A performance report was checked over and returned to the Bureau office.

Edward A. Chester

CA 291.

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

FIELD CORRESPONDENCE

FROM: Elden H. Vestal

PLACE June Lake, California

TO: BUREAU OF FISH CONSERVATION

DATE January 3, 1941

SUBJECT: Monthly report for December 1940

A. Office Work:

1. Portions of Dec. 3-6, 12, 13, 15, 16, and 30 were occupied in official correspondence preparation of routine monthly field and maintainance reports, and in review of biological and fish and game literature received.
2. A report on locations of some "missing" streams and lakes in the Inyo-Mono Area was typed and submitted to the S. F. office, on Dec. 4.
3. A start was made on summarization of the June Lake catch records for 1940 on Dec. 6 and 7, but this work was temporarily deferred through changes in a survey schedule resulting from a conference with Mr. Brian Curtis
4. A conference and tentative program for biological survey work for 1941-1943 was outlined and discussed during the conference with Mr. Curtis from Dec. 9 to 11.
5. A project report on phases of the Gull lake rough fish control experiment was tentatively outlined on Dec. 14.
6. Part or all of the days Dec. 17, 18, 20-23, were occupied in checking planting rosters and planting receipts for the Inyo-Mono Area for 1939 and recording of planting receipt bumbers on planting rosters to facilitate the work of copying the planting data on the stocking records in survey files. During the work of copying, the locations of certain streams and lakes were checked on U.S.G.S. and other sheets at hand.

B. Field Work:

1. At Gull Lake routine examination and cleaning of check screens and dams was accomplished at intervals of Dec. 3-5, 13,14 26, 27, and 30. During the severe snowstorm of Dec. 12-23. damage to the outlet screen was repaired. On Dec. 5, samples of lake bottom plants and animales were taken and preserved; and following this, the experimental live-cars were entirely removed from the lake and Eastern Brook Trout in them preserved in formaldehyde. Analysis on water samples fro Gull Lake, for temp., ., pH, alkalinity, and dissolved oxygen, were made in repeated series on Dec. 27 and 28; at this time. because of the treacherous condition of the ice sheet covering the lake, only marginal samples were used.
2. Both a trip on snowshoes was made to a snow lake on Reversed Peak for water samples and analysis of the samples was made on Dec. 29. The dissolved oxygen content of the sample from the bottom was determined at 1.2 p.p.m., while the top samples contained up to 1.5 p.p.m. Both carbonates and bicarbonates were present, but in comparatively small aount.

OD 305

Glenn H. Vestal

"Bartlebaugh"

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Mammoth Lakes
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Successor to H. F. Gussman

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Come in as you are
Barney Johnson, prop. Mammoth Lakes P.O.

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[illegible]

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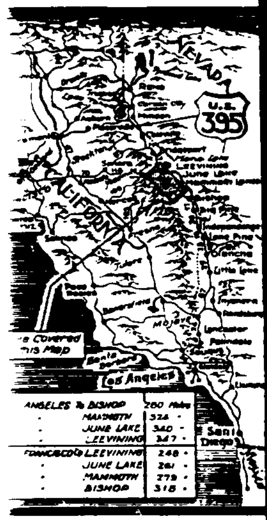

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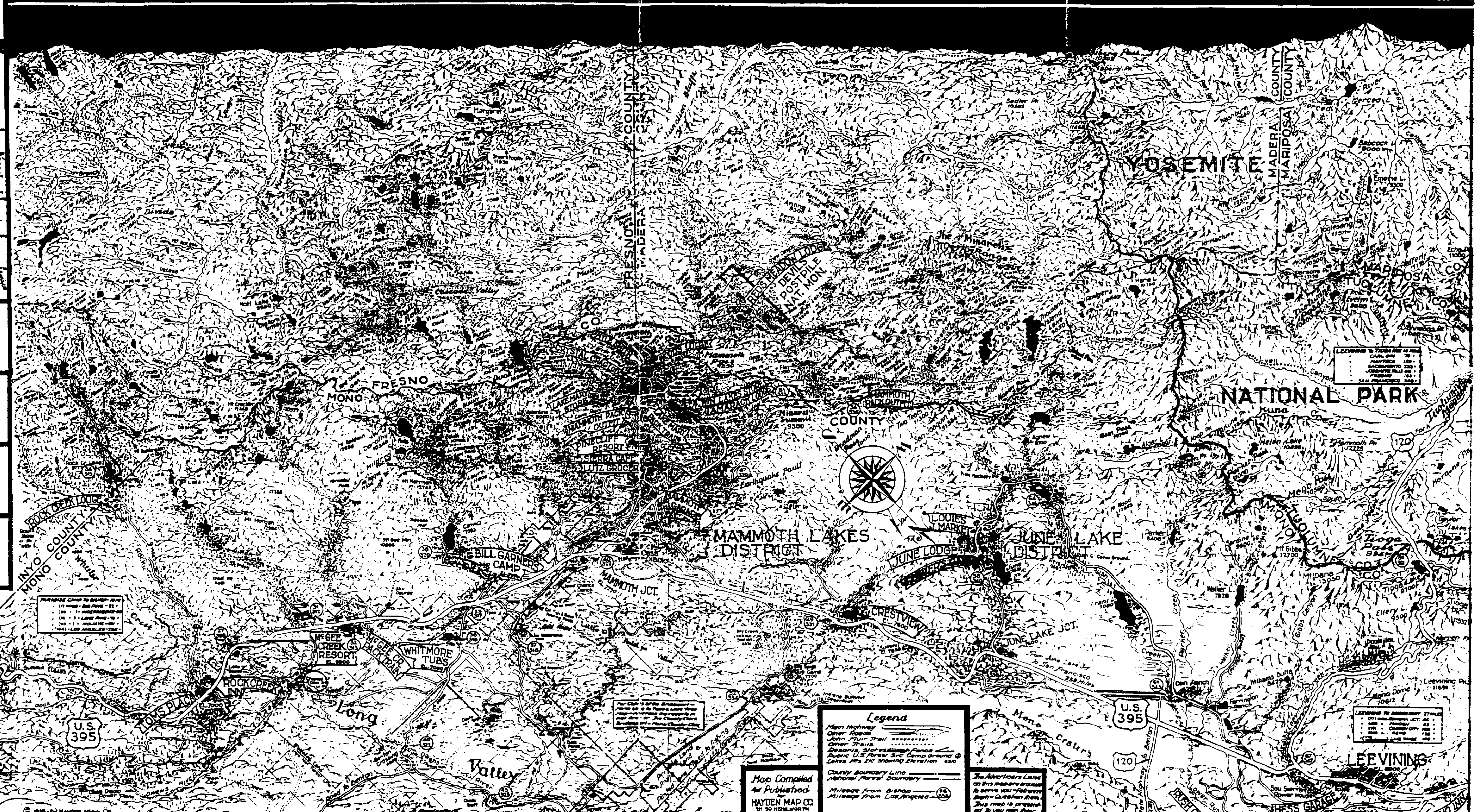

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Nearest Board and Lodging for Owens River for Hot Creek Fishermen. Tub Bath, Showers and 60 ft. Swimming Pool — Largest Plunge [illegible]
[illegible]
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modern 40 Room Hotel with cabins adjoining.
American and European Plan.
Ideally located for a complete vacation —
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Why load your car with groceries from home when our prices are City prices with a slight increase to cover freight costs.
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Come in and get acquainted —
Our prices and merchandise will please you.
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For many years Lower Rush creek has produced the finest of stream fishing —
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MONO INN
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New modern Auto Cottages —
European plan rooms with bath.
Meals — Store — Service Station.
A boat trip to the islands of Mono Lake will prove most interesting —
P.O. Mono Lake.
Write, wire or phone reservations.

Photo of Lee Vining Creek, taken by J. Dixon on July 14, 1916, representing the conditions of Lee Vining Creek in 1940 as Vestel remembers them. The photo shows a fine, rapid trout stream flanked by dense riparian cover (creels alder, willows predominate) with partial stream canopy. Stream shows abundant white water, short pools, extensive gravel, rubble, and some boulders.

Mono Lake Tributary Streams

	RUSH CREEK	PARKER CREEK	WALKER CREEK	LEE VINING CREEK	REMARKS
Section	Lower; 7.93 mi.	Lower; 1.9 mi.	Lower; 2.9 mi.	Lower; 3.5 mi.	From L.A. diversion to mouth
Source	Snow; glaciers; springs and surface runoff	Same	Same	Same	Headwater storage in many tarns and lakes
Barriers	Grant L. dam (Elev. 7,060 ft.) Historically none between mouth and June Lake	L.A. diversion dam (Elev. 7,140 ft.) Historically none between mouth and Parker Lake	L.A. diversion dam (Elev. 7,145 ft.)	L.A. diversion dam (Elev. 7,180 ft.) Dam and apron at So. Sierras Power Plant	Historically, no know barrier between mouth and lowermost glacial lake.
Diversions	Ditches for stock water and range irrigation no screens; duck ponds E & W of delta.	Same - no screens.	Same - no screens.	Local irrigation - no screens.	With completion of Mono Aqueduct and Mono Tunnel, DWP after several years took all flow in 4 main tributaries.
Springs and seepage	Up to 18 cfs in meadows section below gorge	At least 2 springs near mouth.	Seepage near mouth.	Some from return flow from town.	
Tributaries	Parker Cr.; E. Parker Cr.; Walker Cr.	So. Parker Creek.	Bohler Canyon Cr.	Stream from Simpson Log Cabin Creek.	
Volume Flow	(1911-1912) Range 16-1, 280 cfs May-July Range 140-820 cfs est. well over 75 cfs at Old 345, 4-30-1938.	7/22/1911 45 cfs 8/1/1902 21.6 cfs	8/1/1902 26.4 cfs; spring runoff possibly exceeds 75 cfs	Jan -26 (20-48 cfs) May -97 (65-100 cfs) Jul -415.4 (210-698 cfs) Sep -51.0 (38-76 cfs) (Data: USGS 1912)	At normal flows, low water occurred in Winter, gradually rising to peak in May, June and July, then gradually decreasing in Fall to Winter period.
Gradient (average)	Moderate to rapid; av. 82 ft./mi. (Av. 58.5 ft./mi. in test stream section)	Rapid; av. 105 ft./mi.	Rapid to cascading; av. 150 ft./mi.	Rapid to cascading; av. 209 ft./mi.	All can be torrential at extremely high flows.

	RUSH CREEK	PARKER CREEK	WALKER CREEK	LEE VINING CREEK	REMARKS
Velocity	At normal flows from about 1.0 fps in delta to more than 10 fps in Gorge and above at high water.	From zero to more than 10 fps at high flows.	From zero to more than 10 fps at higher flows.	From about 1.0 fps to more than 10 fps in reach above and below U.S. 395 at high water.	Within wide range, most productive instream see from about 0.5 to about 4.0 fps.
Substrate	Pumiccous juices; glacial gravels; rubble; boulders.	Same	Same	Glacial juices; sand; gravel; rubble, and boulders.	(See also Item 16); most productive for spawning is gravel 1/8" to about 3" dia.
Braiding	Building of delta reach with extensive grasses flowing water fowl marsh.	None	None	Some in reach near marsh, beyond limit of riparian cover.	Extensive braiding may be detrimental if flows and velocity patterns are dissipated.
Color and Turbidity	Normally white/clear; some turbidity during Spring runoff.	Same	Same	Usually clear; one case of pollution from Simpson from mine.	Turbidity from Simpson Mine Lasted for more than 1 week.
Alkalinity	pH 7.0-7.2	no data (see remarks)	no data (see remarks)	pH (no data) - see remarks	Inferred within range of good trout streams (7.0-7.8).
Temperature	Air: av. Summer 64.0 F; Winter 24.4 F Water: Seasonal range 36-72 F	Air: Same (Cain Ranch) Water: no data lower section	Air: (same Cain Ranch) Water: no data lower section	Air: (same Cain Ranch) Water: no data lower section	Air: 14 yrs Cain Ranch, U.S.W.B. (1946) Annual Av. 43.6.
Pools/Shelter	Abundant; some plant debris; some pools to over 3 ft. deep.	Abundant; some plant debris.	Abundant; some plant debris.	Some pools over 3 ft. deep; abundant; some detritus and plant debris.	
Bottom Type	Sorted glacial till, gravel, rubble, and boulders; abundant spawning gravel.	Same	Same	Same	"Over 150 ft. of sediments - with deposits of lapilli and pumicous dust from Mono Craters in Lower Rush Creek." (I.C. Russell, 1887)

	RUSH CREEK	PARKER CREEK	WALKER CREEK	LEE VINING CREEK	REMARKS
Shade/Canopy	From zero to more than 75% some sections.	From zero to more than 50% some sections.	From zero to more than 30% upstream to weir.	From zero to more than 80% upstream, below to above U.S. 395.	All streams favored by direction of flow - for sun and shade.
Aquatic Vegetation	Water cress in Meadows area; some algae; marsh plants	Sparse (near springs)	Sparse	Sparse	
Fish Foods	Abundant; more than 7 kinds present.	Plentiful; more than 7 kinds.	Plentiful; more than 7 kinds available and utilized.	Plentiful; more than 7 kinds available and used by trout.	See appended note: Observations of trout indicated good food production - all streams.
Fish Species	BN; RT; EB; CT Grant L. and above to 1946. Dace found 1934 may now be extinct.	BN and EB	BN and EB	BN; RT; EB; CT may have been planted originally late 1800s.	BN tend to dominate in lower sections of all tributary streams to marsh.
Riparian Cover	Willows; cottonwood; creek alder; wild rose; sage and bitter brush; Jeffrey pines; rabbit brush; dense some sections; lodgepole pine.	Willows; cottonwoods; creek alder; sage and bitter brush; wild rose.	Willows; cottonwoods; sage and bitter brush; wild rose; rabbit brush; creek alder.	Jeffrey and lodgepole pine; willows; cottonwood; creek alder; sage and bitter brush; wild rose.	
Spawning	Good to excellent with normal flow regime.	Good to fair with normal flows.	Good to fair with normal flows.	Good to fair at normal flows.	
Basic Productivity	Excellent	Good	Good	Good	
Access	Generally good; chiefly intermittent; difficult where riparian cover very dense.	Chiefly intermittent; difficult where riparian cover very dense.	Chiefly intermittent; difficult where riparian cover dense.	Same	
Fishing Intensity	B to A	C to B	C to B	B to A	

	RUSH CREEK	PARKER CREEK	WALKER CREEK	LEE VINING CREEK	REMARKS
Angls./Mile Use	Test stream Av. 10/mi/day (1947-1951) Other sections at least 50% of test stream use.	Use lessened as flow decreased.	Use lessened as flows decreased.	Comparable to Rush Creek after Spring runoff period; inference from Test Stream results.	
					Note: Without exception, all wild trout observed under preproject flow conditions in Rush Creek, Parker Creek, Walker Creek and Lee Vining Creek were in good to excellent condition. Elden Vestal 2-5-90

H.S. Davis, Fishery Circular No. 26, 1938, used as guide - "Instructions for conducting Stream and Lake Surveys"

Key: BN = Brown Trout
RT = Rainbow Trout
EB = Eastern Brook Trout
CT = Lahonton Cutthroat Trout (Black-spotted)

Fishing Intensity:
A - Heavy (75% standing crop taken/season)
B - Medium (50% standing crop taken/season)
C - Light (25% standing crop taken/season)

STATE OF CALIFORNIA

Fish and Game Commission

TWENTY-NINTH BIENNIAL REPORT

For the Years 1924–1926

CALIFORNIA STATE PRINTING OFFICE
JOHN E. KING, State Printer
SACRAMENTO, 1927

48323

from the Middle Fork of the Kaweah River which has a higher temperature and contains a greater amount of organic matter. The water supply at the old site at Power House No. 1 is taken from the East Fork of Kaweah River and the writer made an examination of the water at this site and found it suitable for hatchery purposes before any attempt was made to establish even a temporary hatchery. The change from the old site to the new site is proving that the water at the new site is not suited for hatchery purposes. No doubt during the fall it will be necessary to move back to the old site and operate there under a tent until more funds are available for the construction of a permanent hatchery which is badly needed in that section.

The output of this hatchery duing the last two seasons was 435,000. In 1924 we distributed 340,000 and in 1925, 95,000 were planted. The

FIG. 10. Experimental hatchery on Rush Creek, Mono County, June 1, 1925. This temporary hatchery is to be replaced soon by a modern hatchery devoted to the rearing of black-spotted trout.

small number planted in 1925 was due to the fact that the water supply was accidentally shut off by a shear board getting loose in the intake box and closing the pipe that furnished the water to the hatchery. The fish perished before the foreman in charge was aware of what had happened. There is an electric alarm system connected with the water supply at all the small hatcheries so that if the water is shut off or the flow is diminished, the alarm bell will ring, thus awakening the help, but on the night that the board closed the intake to the supply pipe, the alarm, for some reason unexplained, failed to work and when an hour or so after the accident, the foreman entered the hatchery nearly all the fish were dead. In 1926 while we were experimenting at the new site an extra man was kept so that during times there was danger of the supply of water fluctuating or of algae floating in the water and causing the screens to choke, some one was always on duty.

h(.d

RUSH CREEK EGG-COLLECTING STATION.

During the spring of 1925, it was decided to establish an egg-collecting station on Rush Creek, Mono County, to collect the eggs of the black-spotted trout. A trap was placed in Rush Creek, a holding tank was built and a temporary hatchery installed under a tent on Silver Creek. Two traps were installed in Reverse Creek, one in Upper Reverse Creek and the other in Lower Reverse Creek in addition to the main trap in Rush Creek.

The take of black-spotted trout eggs from this operation was very gratifying. The black-spotted trout of this region have an excellent lot of eggs that produce vigorous embryos and develop into strong healthy fish. The take of eggs of black-spotted trout from Rush Creek and tributaries during 1925 was 1,010,000. We were fortunate in procuring an egg-collecting station where eggs from this species can be collected as this excellent fish will thrive in all the lakes in this region. Black-spotted trout to the number of 727,500 were planted from this station. The balance of the eggs were shipped to Mount Whitney Hatchery.

JUNE LAKE.

During the spring of 1926, arrangements were made to seine June Lake for steelhead trout. June Lake was first stocked with steelhead trout in 1921. Fishing did not begin for these fish until the season of 1923. During the entire season of 1924 this lake was fished continuously. Many large steelhead weighing from five to eight pounds were taken. In 1925 the fishing improved as the anglers were taking fish in limit catches. The anglers began catching the fish planted in 1922 and 1923 and caught three sizes of fish (being the result of three years' planting since the 1921 plant) ranging from one-quarter pound to twelve pounds in weight. It was a common sight to see twenty to thirty boats on June Lake during the fishing season and all parties catching fish. The native trout of the lake were the black-spotted trout that would ascend Rush Creek during seasons of very heavy rains and snows. These fish would come up from Grant Lake during the spring when an extra heavy rain and snowfall would fill June Lake so that the water would run from June Lake to Grant Lake. No water has flowed from June Lake to Grant Lake in the last six years owing to the unusual dry seasons that have prevailed in that region as well as throughout the entire state, which has materially affected the fishing in all the lakes and streams in California.

As there are no tributary streams to June Lake, the supply of water being kept up by the melting snow and by rainfall, the steelhead trout have no place to spawn, so it is necessary to stock this lake each season and to catch the spawners with a seine when they approach the shores trying to find a place to deposit their eggs. During the short period that our crews were operating on the lake before the opening of the trout season, 1,000,000 eggs were collected. The crews were only operating about ten days when the season opened, May 1st, and the rush of anglers to this lake drove the fish from the shallow water near the shore and compelled our men to cease their operations. The season on the lake as well as throughout the entire Sierra region should not open until June first. Thousands of spawning fish are taken each season from the spawning beds or on their way to the spawning

grounds by anglers during the month of May. This should be prohibited.

FERN CREEK HATCHERY.

Owing to the successful operation on Rush Creek and June Lake in egg-collecting work and the demand for a hatchery in this section, plans were made to have a permanent hatchery established, centrally located, to supply fish to this now famous fishing region where thousands of persons from southern California and other places spend their vacations. An adequate sum was set aside by the Commission to carry out these plans. Material was ordered during June and the work of constructing the hatchery will be started as soon as it is delivered on the ground.

BURNEY CREEK HATCHERY.

The power development on the Pit River including the construction of high dams and the diversion of the water by the Pacific Gas and Electric Company, has broken up the run of salmon that annually ascended this river to spawn and has prevented the trout from making their seasonal migrations in the Pit River. The company agreed to establish hatcheries to take care of this situation as soon as the Department of Fish Culture should decide on the proper location. During the fall of 1925, surveys for hatchery locations were made and a site for a permanent trout hatchery was selected on Burney Creek on land owned by the company, just below Burney Creek Falls. This is a very desirable site, as the land adjoins the Burney Creek State Park. The location is about one-half mile from the shore of Lake Britton which is formed by the dam constructed for the purpose of raising the water level in Pit River to give it the necessary elevation to operate Power House No. 3 of the Pacific Gas and Electric Company's hydro-electric plant. Plans were immediately made by the Department of Fish Culture which met with the approval of the company and the work of establishing this new station will be started this summer and completed by early fall. The Burney Creek Hatchery will enable the Commission to keep the streams of Pit River basin stocked and the lakes and streams as far north as Modoc County, as well as other parts of Shasta County.

HAGAN FLAT SALMON HATCHERY.

A site for a set of racks and salmon traps was selected at Hagan Flat, Shasta County, for the purpose of collecting salmon eggs and hatching and rearing them, to assist in keeping up the rapidly decreasing supply of salmon. But owing to the uncertainty of the run reaching this far up the river because of the obstruction caused by the dam of the Anderson-Cottonwood Irrigation District at Redding and the diminished run of salmon in the Sacramento River it was decided not to build the salmon station at Hagan Flat until the fishway problem at Redding was settled. Also there is a possibility that it will not become necessary to build a hatchery at this place if the company, in carrying out their projects, will build a road to this reach of the river. All that will then be necessary is the placing of the racks and traps in the river to catch the salmon and convey the eggs by truck to the Burney Creek Station,

REPORT OF THE LEGAL DEPARTMENT.

By B. D. Marx Greene, Attorney.

Prior to January, 1926, the legal work of the Commission was handled by a general attorney with headquarters at Sacramento and by an attorney for the Commercial Fisheries Department with headquarters at San Francisco. In January, 1926, upon the reorganization of the Commission, the two legal positions were consolidated with that of the executive officer, and an assistant attorney, Ralph W. Scott, was appointed to serve at San Francisco.

The legal work of the Commission is divided into certain main classifications:

1. The prosecution in the justice's court of cases involving violation of fish and game laws where assistance is requested by district attorneys of counties. This usually happens when technical provisions of the law are in question or when a jury has been demanded. Usually the game wardens prosecute their own cases and do not call for assistance unless some unusual legal question is presented or a jury is demanded.

2. Superior court actions for injunction brought in the name of the people of the State of California through the office of the attorney general in which the attorney for the Commission appears of record and actually handles the legal proceedings.

3. Actions commenced in the superior court against the Commission, or individual employees of the Commission in their representative capacity, either to compel the performance of a certain duty or to enjoin the Commission and its officers from performing some specific function.

4. Original applications to either the appellate or Supreme Court to compel the Commission to take action or to desist from taking action.

The following is a summary of cases handled by the legal department of the Commission during this biennial period:

SUPREME COURT.

People vs. *Monterey Fish Products Company*, 69 Cal. Dec. 261. Decided March 4, 1925.

Action brought in the superior court of Monterey County for injunction to prevent defendant from operating an independent reduction plant using sardines for fertilizer purposes. The superior court decided in favor of the defendant. The case was appealed to the Supreme Court and reversed. This is now one of the leading cases in California and the nation in regard to state ownership of fish and game in its sovereign capacity and lays down certain general principles relative to waste of food fish and the right of the state to regulate its taking and use.

In re Berto, 69 Cal. Dec. 420.

Original application to the Supreme Court for a writ of *habeas corpus* upon the ground that the offense charged in the original cause in justice's court was insufficient because it failed to allege that the beach net or seine which was being used in violation of law was used for the particular purpose of taking and catching fish. This decision liberalized the law and makes it much easier hereafter to charge similar

offenses. This case is interesting because the Commission convicted the defendant in justice's court and appeal was taken to the superior court of San Mateo County and the judgment sustained. A request for a writ of *habeas corpus* was made to the appellate court and denied and, finally, the same question was passed upon by the Supreme Court in this case.

In re Angelo Biardo, 69 Cal. Dec. 420. Same as above.
In re Jack Biardo, 69 Cal. Dec. 420. Same as above
In re Cerruti, 69 Cal. Dec. 420. Same as above.
In re Spurtino, 69 Cal. Dec. 420. Same as above.

DISTRICT COURT OF APPEAL.

Van Camp Sea Food Company vs. *Newbert et al., Commissioners*, 49 Cal. App. Dec. 38. Decided December 23, 1925.

This was an application for *certiorari* to review an order of the Fish and Game Commission regulating the amount of fish used in the manufacture of fertilizer by fish canning plants. The Commission contended that the application should be denied because the act of the Commission was not of such a judicial nature as to justify a proceeding *in certiorari*. The court held that the Fish and Game Commission had no right to exercise judicial functions and if, therefore, in fact, this function attempted to be exercised by the Commission was either judicial or quasi-judicial, the writ would not lie.

Stafford Packing Company vs. *Newbert et al.*, 49 Cal. App. Dec. 41. Same as previous case.

Pacific Marine Products vs. *Newbert et al.*, 49 Cal. App. Dec. 41. Same as previous case.

Southern California Fish Corporation vs. *Newbert et al.*, 49 Cal. App. Dec. 41. Same as previous case.

Los Angeles Sea Food Products Company vs. *Fish and Game Commission*, 49 Cal. App. Dec. 41. Same as previous case.

Franco-Italian Packing Company vs. *Newbert et al.*, 49 Cal. App. Dec. 41. Same as pervious case.

Van Camp Sea Food Company vs. *Newbert et al.*, 49 Cal. Dec. 362. Decided February 25, 1926.

This is a companion case to the other Van Camp case above, but here the plaintiff seeks mandamus to compel the Commission to issue a new order relative to the amount of fish to be used for manufacture of fish meal. The court, however, adopted the interpretation of the fish reduction act claimed by the Fish and Game Commission and declared that portion of it unconstitutional on which the plaintiff relied. The demurrer to the petition was therefore sustained and the writ discharged.

People vs. *James A. Makings*, No. 1323, First Appellate District, Division Two. Decided May 17, 1926.

An application for a writ of *habeas corpus* directed to a constable of Sausalito township to secure release of petitioner from custody on a charge of transporting crabs from fish and game district 1½. This raised the question of the constitutionality of section 623 of the Penal Code which prohibits the exportation of crabs from certain designated districts in northern California. The constitutionality of the law was upheld and the writ denied.

SUPERIOR COURT.

People vs. *Globe Cotton Oil Mills*. Action filed in the superior court of Los Angeles County in January, 1925, for an injunction to prevent the defendant from using whole fish for reduction purposes to make an edible oil product. On February 3, 1925, the injunction was granted as prayed for in the complaint. Subsequently, when the new reduction act was passed by the legislature in 1925 the action was dismissed.

People vs. *Hovden Company*. This action was filed for an injunction October 23, 1925, in the superior court of Monterey County as a result of alleged overuse of sardines for reduction purposes by the defendant. Temporary restraining order granted and on November 14, 1925, by stipulation injunction *pendente lite* granted restraining defendant until further order of the court from violating the orders of the Commission relative to the amount of fish to be used for reduction purposes.

People vs. *Pacific Marine Products*. Action filed in the superior court of Los Angeles County January 29, 1926, to prevent the defendant from using fish for reduction purposes in violation of law. Action still pending.

People vs. *Gilbert Van Camp*. Same as previous case.

People vs. *Italian Food Products Company*. Same as previous case.

People vs. *Franco-Italian Packing Company*. Same as previous case.

People vs. *Battaglia et al*. In the superior court of Marin County. Appeal from the justice court of Sausalito township involving a question of illegal use of nets. Action still pending.

Lowe vs. *Carpenter*. In the superior court of Glenn County for injunction to prevent seizure of 270 geese used as decoys. Action still pending.

CASES INVOLVING INSTALLATION OF SCREENS.

A large number of injunction cases are pending at the present time to compel the installation and maintenance of fish screens in irrigation ditches and canals. Very few of these cases have been pressed since the reorganization of the Commission, as a new bureau has been installed to care for these matters and a general survey of the state is being made at the present time. Until this survey is completed most of the cases have been left in abeyance.

CONDEMNATION OF NETS.

Under section 636*a* of the Penal Code, it is the duty of the Fish and Game Commission to commence proper proceedings in the superior court to condemn all nets seized for violation of the fish laws. In compliance with this section the Commission instituted 73 separate proceedings in the courts of this state for such condemnation and in each instance obtained from the superior court an order of condemnation.

OPINIONS.

In addition to the court proceedings, the legal department of the Commission renders numerous opinions, both formal and informal.

Also, for the guidance of the Commission, we are greatly indebted to U. S. Webb, Attorney General of the state, who has at all times cooperated with us to the fullest extent in handling such legal proceedings as were necessary, and in giving us formal and informal opinion, suggestions and advice.

1925

Rush Creek Hatchery.

County—	Black Spotted
Mono	520,000

Fort Seward Hatchery.

County	Rainbow	Steelhead	Black Spotted	Salmon	Cutthroat
Humboldt	2,246,260	943,610	200,000	249,730	10,000
Mendocino	540,000	265,000			
Trinity	100,000				
Totals	2,886,260	1,208,610	200,000	249,730	10,000

Ukiah Hatchery.

County	Rainbow	Steelhead
Lake	30,000	100,000
Mendocino	39,500	331,000
Sonoma	80,000	280,000
Totals	149,500	711,000

Tahoe Hatchery.

County	Rainbow	Large Lake
El Dorado	265,000	25,000
Nevada	65,000	
Placer	600,000	160,000
Sierra	40,000	20,000
Totals	970,000	205,000

Tallac Hatchery.

County	Rainbow	Steelhead	Large Lake
Alpine	45,000		20,000
El Dorado	700,000	85,000	295,000
Totals	745,000	85,000	315,000

Domingo Springs Hatchery

County—	Rainbow
Lassen	235,000
Plumas	270,627
Total	505,627

Clear Creek Hatchery

County—	Rainbow
Lassen	594,942
Plumas	78,000
Shasta	10,000
Total	682,942

Bear Lake Hatchery

County—	Rainbow
San Bernardino	1,040,000

North Creek Hatchery.

County—	Rainbow
San Bernardino	1,000,000

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

Division of Fish and Game

THIRTIETH BIENNIAL REPORT

For the Years 1926–1928

closing order on the 11th day of April, 1928. This will insure an adequate number of golden trout for all the lakes and streams in which this species will thrive.

We have recommended in our budget for the biennial period beginning July 1, 1929, and ending June 30, 1931, the building of a permanent cabin and its equipment at this station. Heretofore the egg-collecting crew camped out and had to operate under adverse conditions that were often very difficult as the lake is situated at an elevation of approximately 12,000 feet above sea level. A comfortable cabin should be erected for the accommodation of the help, as no doubt in a few years the output of golden trout eggs will be increased by the protection of the spawners, and a large number of this species must be planted each season as there will be more of this species caught when the public learn of the results obtained by stocking the barren lakes. The fry planted from Mt. Whitney Hatchery are now thriving in many lakes and streams, particularly in Desolation Lake, Duck Lake and the Dusey lakes. They are reported as thriving in Dorothy Lake, Virginia, Treasure, Genevieve, Morgan and Sherwin lakes, situated in the High Sierra, north and west of Bishop. These fish were hatched at Mt. Whitney Hatchery and the majority of them planted by members of the Rainbow Club of Bishop. They thrive only in high altitudes where the water is pure and cold and free of any organic matter that will in any way pollute the waters. The golden trout have been successfully introduced in the lakes and streams of the upper San Joaquin River and other waters in the southern High Sierra range. Years ago many adult fish were distributed in barren lakes by the deputies from the Fresno office. In many of the High Sierra lakes aquatic plants and insects should be introduced to furnish an abundance of feed for the golden trout that are being planted, as well as to introduce the same into waters already stocked.

RAE LAKES EGG-COLLECTING STATION

These lakes are producing but very few eggs. During 1926 the station was not operated. The season of 1927 being one in which the collection of eggs from wild fish did not open favorably, we opened the station at Rae Lakes in an effort to collect a larger number of eggs if possible. The crews were sent to the lakes the latter part of June just as soon as they could cross the pass and reach the lakes. The station was closed on July 24th as the small run of adult fish was over. The total take was only 60,000 eggs.

After the introduction of aquatic plants and insects into Rae Lakes, a number of years ago, the condition of the fish improved, but the excessive fishing soon depleted the supply, although it is a fish preserve. Recommendations were made in our last biennial report that this lake be posted and the law enforced. It is at an altitude of 10,700 feet above sea level and would require the services of a warden during the entire season to prevent the anglers from fishing and it is doubtful whether the number of fish that the lakes would furnish will justify the expense.

FERN CREEK HATCHERY

This hatchery was built during the summer of 1926 and produced very fine vigorous fish that are distributed in June Lake, Gull Lake, Rush Creek and the lakes and streams of Mono County. The average

output of fish for the last two seasons has been approximately 1,000,000 fish. The fish distributed from this hatchery are showing up in large numbers in the waters where they have been planted. Fern Creek Hatchery was first operated as an experimental station during the season of 1925. The resulting fry were planted in the lakes and streams in the adjacent district. All of the plants from this station have been successful.

FIG. 16. The new Fern Creek Hatchery, as it appeared in the spring of 1927.

RUSH CREEK EGG-COLLECTING STATION

Since this station was established in 1925, it has furnished an average of 2,000,000 eggs each season. Despite the many persons fishing in Grant Lake the black-spotted trout appear to be increasing. The take of eggs from Rush Creek Station during the spring of 1928 was 3,000,000.

GULL LAKE

We collected a total of 2,050,000 eastern brook trout eggs from this lake during the two seasons just passed. During the fall of 1926, 1,100,000 eastern brook trout eggs were collected. This lake is holding up very well considering the number of fish caught there each season by the anglers.

WALKER RIVER EXPERIMENTAL HATCHERY

An experimental hatchery was established on Walker River, Mono County, during the spring of 1928 to test the water to determine whether or not it is suitable for hatchery purposes. A tent and troughs were installed and 250,000 eggs will be hatched and a practical demonstration made before recommending any permanent work. The station is located on the Little West Walker River, 60 miles from Fern Creek Hatchery, on forestry land.

If this site is not suitable, we recommend that experiments for a permanent hatchery be made in Alpine County where four river systems

as well as many lakes can be stocked. During the fall of 1928 we will have a survey of the Alpine region made, as it is only a question of time when the Alpine County region will require a large hatchery, as the Mono County hatcheries can not adequately supply this district.

JUNE LAKE

June Lake, a barren body of cold pure water prior to 1921, was first stocked with steelhead trout in 1921. During 1926, the fish had developed to such a size that egg-collecting work was planned and successfully carried out. The first take of eggs exceeded 1,000,000. During 1927, 1,200,000 eggs were collected, but the rush of anglers to this lake on the opening day, May 1, made it impossible for our crews to seine up the fish, so the egg-collecting work was given up shortly after the season opened. With the opening set for June 1 by the last legislature, more eggs can be collected and better fishing afforded the anglers as a greater number of fish can be hatched and planted each season.

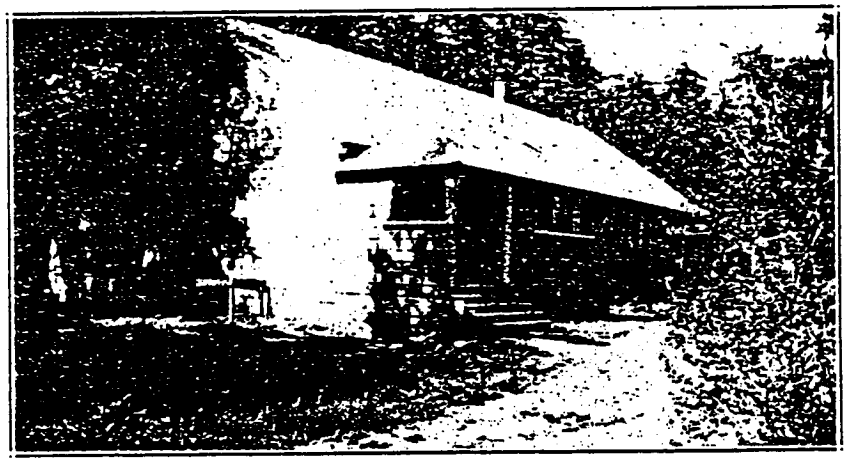


FIG. 17. The new Big Creek Hatchery, built to handle the work in Santa Cruz County. The old Brookdale Hatchery is now utilized for experimental work. Photograph by C. L. Frame.

CLEAR CREEK HATCHERY

This hatchery has been operated the same as in the past few years. In addition to the fish raised in the hatchery, ten rearing tanks were constructed to hold the surplus fish. This hatchery is run in conjunction with Domingo Springs Hatchery on the North Fork of the Feather River above Chester. Both of these hatcheries should be abandoned as soon as funds are available for the construction of a large hatchery in that vicinity. There should be a large hatchery erected on a site where a suitable supply of water can be obtained. This hatchery should be large enough to raise fish for the entire Almanor Basin, as well as for the lakes and streams in the Lassen Park.

Surveys should be made at an early date, and if conditions are found suitable, an experimental hatchery should be established this fall and operated during the summer of 1929.

REPORT OF THE LEGAL DEPARTMENT

By Eugene D. Bennett, In Charge

On the last day of December, 1927, Mr. B. D. Marx Greene resigned as executive officer and attorney for the Division of Fish and Game. Thereafter the legal work of the division was taken over by Mr. Eugene D. Bennett with the assistance of Mr. Ralph W. Scott and carried on at the office of the division in San Francisco.

The legal activities of the division are quite extensive and may be summarized in the following manner:

I

Prosecution of civil actions in the superior courts to enjoin public nuisances such as pollution of public waters, the maintenance of dams without fish ladders, diversion of waters without fish screens and other actions involving the preservation of fish and game. These actions are instituted in conjunction with the office of the Attorney General and in the name of the People of the State of California. The attorneys for the division appear as attorneys of record in these cases and handle all matters appertaining thereto.

II

Defense of all actions instituted in the superior court or in any of the higher or inferior courts against the division, the Commission, or any employees thereof in their official capacities.

III

Prosecution of criminal cases in the justice or police courts involving violations of fish and game laws, when requested to do so by the various district attorneys. Usually the deputy fish and game commissioners prosecute their own cases. But where a jury has been demanded or where the facts surrounding a case present some unusual feature, technical question, or local angle, the attorneys for the division appear. Fourteen of these cases were prosecuted by the division during the biennium.

IV

Rendition of opinions formal and informal for sportsmen throughout the state and those identified commercially with fish and game, such as fish packers, game farmers, propagators of domestic trout and the like. The attorneys for the division are constanly called upon to interpret the various fish and game laws for the public generally and for the employees of the division, particularly the men in the field.

The following is a résumé of the cases handled by the legal department during this biennium.

SUPREME COURT

Globe Cotton Oil Mills vs. *Zellerbach et al.*, 200 Cal. 276. This action was instituted by the filing of a petition for writ of mandate to compel the Division of Fish and Game to hold a hearing under the provisions of what is commonly known as the Fish Reduction Act (Statutes 1925, page 595), to determine whether a permit should be issued to petitioner to use sardines in the manufacture of edible oil. The division refused to hold the hearing, basing its refusal upon the language of a decision

of Judge Stephens of Los Angeles which seemed to deprive the Commission of all quasi-judicial powers, including that of holding hearings. The Supreme Court, however, decided in favor of petitioner. While a technical defeat for the division, it was, in reality, a victory because it restored to the division the right to hold hearings and pass quasi-judicially on matters intrusted to it by the legislature.

Ocean Industries, Inc., vs. *Superior Court, etc.*, 200 Cal. 235. This was a petition to the Supreme Court by the Ocean Industries, Inc., for a writ of prohibition to prevent the superior court in and for the county of Santa Cruz and Hon. H. C. Lucas, judge thereof, from proceeding further in a case entitled *People of the State of California* vs. *Ocean Industries, Inc.* In the latter case the division sought to enjoin the operations of the defendant on the steamer *Peralta* which had been anchored in Monterey Bay more than three miles offshore but within the confines of the bay. That concern had started to reduce fish in a manner contrary to the provisions of the Fish Reduction Act above referred to. To this petition the division filed a demurrer. The petition for the writ was denied. In a lengthy opinion the court upheld the jurisdiction of the state over the waters of Monterey Bay.

In re Makings, 73 Cal. Dec. 260. This was an application for a writ of *habeas corpus* directed to the constable at Sausalito to secure the release of petitioner from custody. He was being held on charge of transferring crabs from fish and game district 1½ to Sausalito. This case attacked the constitutionality of that portion of section 628 of the Penal Code commonly known as the Humboldt crab law. Petitioner claimed that that portion of the act which prohibited him from exporting crabs from Humboldt County was unconstitutional. On May 17, 1926, the District Court of Appeal upheld the law and denied the writ. Thereafter the petitioner brought the case before the Supreme Court, which affirmed the decision of the District Court of Appeal and sustained the contention of the division.

Zuanich vs. *Zellerbach et al.* This was a petition sought out in the Supreme Court for a writ of supersedeas to prevent the Fish and Game Commission from enforcing a judgment rendered in the superior court of Santa Cruz County condemning certain fish nets used in conjunction with the operations of Ocean Industries, Inc. To this petition the Commission demurred. Before the matter was submitted, it was settled out of court and the appeal was thereupon dismissed.

Andrew Zamberlin vs. *Zellerbach et al.* Same as previous case.

UNITED STATES DISTRICT COURT

Ocean Industries, Inc., vs. *Zellerbach et al.* This was a proceeding for injunction instituted by the Ocean Industries, Inc., combined with an action to recover damages from the Fish and Game Commissioners and several of the division employees. The suit was a result of steps taken by the division and its employees to prevent the operations of the Ocean Industries, Inc., in Monterey Bay on board the stamer *Peralta*. Extent of jurisdiction of the State of California over the waters of Monterey Bay was the legal question involved. The division demurred to the complaint and after oral argument an opinion was handed down by District Judge St. Sure upholding the contention of the division

and denying injunction relief and damages. The court in this case held that the waters of Monterey Bay are territorial waters, irrespective of the three-mile zone.

SUPERIOR COURT

People vs. *Italian Food Products Co.* This was an action commenced in the superior court of Los Angeles County to prevent the defendant from using fish for reduction purposes. This action was brought on the theory of the division that, in the light of the ruling in *Van Camp Sea Food Co., Inc.*, vs. *Fish and Game Commission*, 49 Cal. App. Dec. 38, packers were not entitled to any allowance for reduction purposes whatsoever, inasmuch as the method of determining the capacity of their plants as provided in the Fish Reduction Act had been declared unconstitutional. The case came on for hearing before Judge Stephens of Los Angeles on a demurrer filed by the defendants. In a lengthy opinion the court held that every packer was entitled to an allowance for reduction purposes of 25 per cent of the capacity of the plant but that the Fish and Game Commission was without judicial power to determine such capacity. This case was decided August 9, 1926.

People vs. *Marine Products Company.* Same as previous case.

People vs. *Van Camp.* Same as previous case.

People vs. *Franco Italian Packing Co.* Same as previous case.

People vs. *Anderson-Cottonwood Irrigation District.* This was a suit for injunction filed in the superior court at Redding to prevent the defendant from maintaining its dam in the Sacramento River until such time as it complied with an order of the Fish and Game Commission to install a fish ladder. The matter was settled out of court when the defendant agreed and proceeded to install. In consequence thereof the action was dismissed.

People vs. *Battaglia et al.* This was an appeal to the superior court of Marin County from a judgment of the justice court at Sausalito. The defendant had been convicted for illegal use of nets. After oral arguments the judgment of the lower court was upheld and the appeal dismissed.

Lowe vs. *Carpenter et al.* This is an action commenced by the owner of 270 live geese for an injunction to prevent the seizure thereof by deputies of the Fish and Game Commission. The geese are used as decoys. The case is still pending.

People vs. *Bayside Fish Flour Company.* This was an action commenced by the division to enjoin the defendant from taking fish into its plant and there manufacturing it into an edible product. This case was brought to test out the point raised by the division that the granting of a permit to manufacture such a product would be a judicial act on the part of the division, in view of the decision of Judge Stephens of Los Angeles in *People* vs. *Italian Food Products Co.*, and would be void *ab initio*. On November 24, 1926, Judge Treat of Salinas decided in favor of the defendant, holding that the division had power to grant such a permit.

People vs. *Ocean Industries, Inc.* This was an action commenced in the County of Santa Cruz to restrain the operations of the defendant aboard its steamer *Peralta*, heretofore referred to. Injunction *pendente lite* was granted but thereafter the defendant company retired from business, ceased its operations, and removed its steamer.

People vs. *Marine Corporation et al.* This is a petition to the superior court of Los Angeles for injunctive relief against various defendants for causing oil to be deposited into the Pacific Ocean at Long Beach. Action is still pending.

Stanley Hiller, Inc., vs. *Zellerbach et al.* This was a petition for injunction commenced in the superior court of Alameda County to prevent the Division of Fish and Game and its representatives from interfering in any way with the proposed operations of petitioner. The company intended to send a steamer to sea known as the *Lake Miraflores* equipped to operate as a fish reduction plant. Judgment was rendered for the defendant Commission.

People vs. *Stanley Hiller, Inc.* This was a suit brought in the superior court of Alameda County for injunction to prevent operations of the defendant aboard the steamer *Lake Miraflores* off San Pedro. At that time the *Lake Miraflores* had anchored more than three miles from shore. It was contended by the division that the ship was in the confines of San Pedro Bay and consequently in territorial waters. The judge held, however, that the steamer was not within the limits of San Pedro Bay but was, at the time of the operations, on the high seas. This case was decided March 7, 1927.

Petrich vs. *Maddox et al.* This was an action instituted in San Diego County to recover damages from certain employees of the division who had arrested the plaintiff and taken a quantity of fish from him for violating the law. This case went to trial and was decided in favor of the defendants.

People vs. *Glenn-Colusa Irrigation District.* This is an action instituted by the division in the superior court of Glenn County to enjoin the defendant district from diverting water from the Sacramento River into its irrigating ditches until such time as it installs a fish screen at the intake thereof in accordance with the order of the division. Action is still pending.

Sturtevant vs. *Greene et al.* This was an action commenced in the superior court of Marin County to recover damages from a group of employees of the division. It was based on the ground that a quantity of fish had been taken unlawfully from the plaintiff by defendants. Judgment was rendered for the defendants on October 20, 1927.

People vs. *Central Mendocino Power Co.* This is an action instituted by the division in Mendocino County to enjoin the defendant power company from maintaining a dam in James Creek until such time as it installs a fish ladder therein in accordance with an order of the division. Judgment rendered in favor of the defendant on March 5, 1928. Notice of appeal has been filed by the division. The case is still pending.

People vs. *Associated Oil Company.* This is an action commenced in Los Angeles County to enjoin seventy oil operators at Huntington Beach from polluting the waters of the Pacific Ocean with petroleum. The action is pending.

People vs. *Gardella.* This was an action commenced in the superior court at San Francisco to enjoin the defendant, a resident of that city, from maintaining a dam in Trinity County without first having installed a ladder in accordance with an order of the division. Judgment was rendered for the people on December 1, 1927.

p 143

People vs. *Sea Coast Packing Corp.* This was a suit started in the superior court of Los Angeles County to restrain the defendant from operating its plant without first having had the capacity of said plant determined by the division in accordance with the terms of the Fish Reduction Act. This action was based on the decision of the Supreme Court in *Globe Cotton Oil Mills* vs. *Zellerbach*, hereinabove cited, which gave the division the right to quasi-judicially make determinations of fact and hold hearings. This case was heard before Judge Stephens of Los Angeles, who practically overruled his former decision in *People* vs. *Italian Food Products Co.*, heretofore quoted. Whereupon the defendant made application to have its capacity determined and in view thereof the case was dismissed.

People vs. *Southern Fish Corporation.* Same as previous case.

People vs. *Kittle-Joerissen Canning Co.* Same as previous case.

People vs. *Van Camp Sea Food Company, Inc.* Same as previous case.

People vs. *Submarine Oil Company et al.* This is an action to restrain four oil producers from polluting the waters of the Pacific Ocean at Summerland with petroleum. The case is still pending.

People vs. Lomita Gasoline Co. et al. This is an action to restrain six oil companies from polluting the waters of the Pacific Ocean at Long Beach with petroleum. The matter is still pending.

People vs. *Gibson et al.* This is an action commenced in the superior court of Trinity County to enjoin the defendants from maintaining a dam until such time as they install a fish ladder as required by law. Action is still pending.

People vs. *Enos et al.* This is a suit instituted in Trinity County similar to the previous case.

People vs. *Kittle-Joerissen Canning Company, Inc.* This is an action commenced in the county of Sacramento to recover delinquent taxes for the privilege of taking fish as provided by chapter 687, Statutes 1917. Action is still pending.

People vs. *L. A. Sea Food Products Co.* Same as previous case.

CONDEMNATION OF NETS

It is the duty of the division under section 636*a* of the Penal Code to instigate proceedings to condemn all nets seized in violation of fish laws. These actions are brought in the superior courts. In compliance with this section the Commission started one hundred sixteen separate proceedings. In each instance it obtained a judgment of condemnation.

HEARINGS

In accordance with various fish and game statutes the division is obliged to conduct and hold hearings to determine facts incidental to the regulation of fish and game; such as the necessity for fish screens or fish ladders, the capacity of packing plants, the feasibility of issuing permits and so forth. At all these hearings the division is represented by the legal department. Twenty-nine hearings were held for the Commercial Fisheries Department of the division and three hearings were held on fish screen and ladder matters.

FISH DISTRIBUTION BY COUNTIES, SEASON 1027

MT. SHASTA HATCHERY

County	Rainbow	Loch Leven	Steelhead	Eastern brook	German brown	Brown spotted	Salmon
Alameda		34,000			6,000		
Alpine			16,000				
Amador	100,000	40,000	40,000	70,000	20,000		
Butte	146,700	42,000	88,000	35,000		30,000	
Calaveras	55,000	20,000	15,000		370,000		
Colusa	32,000						
Del Norte				78,000			
El Dorado	100,000	149,960	150,000	60,990	10,000		
Fresno		508,000			130,000		
Glenn	22,950						
Kern		140,000					
Lake	12,000	49,000			175,000		
Lassen		484,000					
Los Angeles		5,000			20,000		
Madera	30,000	64,000		64,500	10,000		
Marin	20,000	64,000					
Mariposa	14,000	231,000		18,000			
Mendocino				5,000	250,000		
Merced		132,000					
Modoc		38,000	6,000	141,850			
Monterey	10,000	228,000			12,000		
Napa	62,000	386,000			40,000		
Nevada	191,000	317,000		10,000		20,000	
Placer	113,000	319,000	25,000	28,000	55,000		
Plumas	17,200	461,000		9,000			
San Benito					8,000		
Santa Cruz				15,000			
Shasta	147,000	84,500		99,000	19,000	55,000	
Siskiyou	118,500	72,000	20,000	183,000		50,000	6,055,000
Sonoma					420,000		
Tehama	139,850	5,000	25,000	34,000	4,000		
Trinity	20,000	10,000	156,970	124,000	5,000		
Tulare		60,000			454,000		
Tuolumne	45,500	327,000		82,000			
Yuba	3,800						
Totals	1,400,500	4,290,460	541,970	1,057,340	2,008,000	135,000	6,055,000

FALL CREEK HATCHERY

County	Rainbow	Salmon
Siskiyou	219,000	3,762,000

MOUNT WHITNEY HATCHERY

County	Rainbow	Loch Leven	Steelhead	Eastern brook	Black spotted	Golden
Alpine	34,000				55,000	
Fresno	5,000		48,000	158,000		
Inyo	274,000	180,000	55,000	125,000	116,000	320,000
Kern			186,000	10,000		
Los Angeles	14,000			28,000		
Mono	179,000			223,000	199,000	81,000
Monterey	126,000	30,000	154,000	10,000	70,000	
Nevada	3,000		42,000			
Orange	6,000		2,000	8,000		
Riverside			15,000	28,000		
San Luis Obispo		67,000	242,500			
Santa Barbara	20,000	55,000	10,000	32,000		
Sierra	12,000		133,000			
Tulare			94,000	47,000		
Ventura	139,000	8,000	65,000			
Totals	812,000	340,000	1,046,500	669,000	440,000	401,000

FERN CREEK HATCHERY

County	Steelhead	Black spotted
Alpine	109,000	
Mono	376,000	547,000
Tuolumne	15,000	
Totals	500,000	547,000

FORT SEWARD HATCHERY

County	Rainbow	Steelhead	Black spotted	Cut-throat
Humboldt	144,180	669,070	148,900	166,000
Marin		180,000		
Sonoma		249,000		
Mendocino	65,000			
Totals	209,180	1,098,070	148,900	166,000

UKIAH HATCHERY

County	Steelhead
Lake	145,000
Mendocino	570,000
Total	715,000

TAHOE HATCHERY

County	Rainbow	Loch Leven	Steelhead	Eastern brook	Black spotted	Large lake
Calaveras						20,000
Del Norte						146,000
El Dorado	6,000	34,000	257,500	186,000	75,000	57,500
Nevada			70,000			
Placer					289,000	
Siskiyou					4,000	
Totals	6,000	34,000	327,500	186,000	368,000	223,500

TALLAC HATCHERY

County	Large lake
El Dorado	900,000

CLEAR CREEK HATCHERY

County	Rainbow
Lassen	237,936
Placer	198,000
Total	435,936

FISH DISTRIBUTION BY COUNTIES, SEASON 1926

Mount Shasta Hatchery

County	Rainbow	Loch Leven	Eastern brook	German brown	Salmon	Cut-throat	Black spotted
Alameda	50,000						
Alpine	70,000		25,000				
Amador	121,000	215,000	113,000				
Butte	260,000	50,000	197,000				
Calaveras	95,000	230,000	25,000	50,000			
Colusa	40,000		4,000				
El Dorado	155,000	330,000	234,000				
Fresno	205,000	450,000	275,000	25,000			
Glenn	24,000		8,000				
Kern	80,000		80,000				
Lake	20,000	12,000	15,500	310,000			
Los Angeles				16,000			
Madera	62,000		91,000				
Marin	20,000	65,000					
Mariposa	60,000	262,000	192,000				
Mendocino				250,000			
Merced		250,000					
Modoc	93,000	40,000	96,000				
Mono	50,000						
Monterey	315,000	180,000					
Napa	52,000	636,000		40,000			
Nevada	297,000	150,000	223,000				
Placer	107,000	54,000	161,000				
Plumas	64,000	65,000	42,000				
San Diego				201,219			
San Francisco*							
San Luis Obispo	40,000						
San Mateo	54,000		24,000				
Santa Barbara	16,000	24,000	8,000				
Santa Cruz	20,000		35,000				
Shasta	194,000	85,000	136,000				
Sierra			52,000				
Siskiyou	412,000	680,000	348,000		11,248,000	20,000	130,000
Sonoma	12,500	100,000		750,000			
Tehama	175,000	5,000	42,000	4,000			
Trinity	92,000		41,000			8,000	
Tulare		8,000	45,000	20,000			
Tuolumne	254,000	128,000	235,000	200,000			
Yolo				32,000			
Totals	3,512,500	4,079,000	2,750,500	1,898,219	11,248,000	28,000	130,000

*Adult mackinaw, 130

FALL CREEK HATCHERY

County	Rainbow	Salmon
Siskiyou	332,000	3,765,000

MOUNT WHITNEY HATCHERY

County	Rainbow	Loch Leven	Steelhead	Eastern brook	Black spotted	Golden
Inyo	511,000	220,000	138,000	183,000	90,000	262,000
Kern		60,000				
Los Angeles	240,000		150,000			
Mono	251,000		290,000	133,000	210,000	158,000
Orange	5,000		5,000			
Riverside	125,000		85,000	10,000		
San Bernardino	45,000	5,000	15,000	10,000		
San Diego	55,000	10,000	160,000			
Santa Barbara		12,000				
Tulare	175,000	10,000	145,000	60,000		
Ventura	80,000	20,000	155,000			
Totals	1,487,000	337,000	1,133,000	396,000	300,000	420,000

FERN CREEK HATCHERY

County	Black spotted
Mono	500,000

FORT SEWARD HATCHERY

County	Rainbow	Steelhead	Black spotted	Salmon
Humboldt	576,510	$00,610	99,330	1,898,590
Mendocino	90,000	65,000		
Totals	666,510	$65,610	99,330	1,898,590

UKIAH HATCHERY

County	Steelhead
Lake	120,000
Mendocino	480,000
Sonoma	150,000
Total	750,000

TAHOE HATCHERY

County	Rainbow	Black spotted	Large lake	Cut-throat
El Dorado		50,000		
Placer	110,000	700,000	$25,000	90,000
Totals	110,000	750,000	825,000	90,000

TALLAC HATCHERY

County	Large lake	Black spotted
Alpine		100,000
El Dorado	410,000	200,000
Totals	410,000	300,000

CLEAR CREEK HATCHERY

County	Rainbow
Lassen	25,000
Plumas	25,000
Total	50,000

DOMINGO SPRINGS

County	Rainbow
Lassen	228,000
Plumas	385,385
Shasta	42,000
Total	655,385

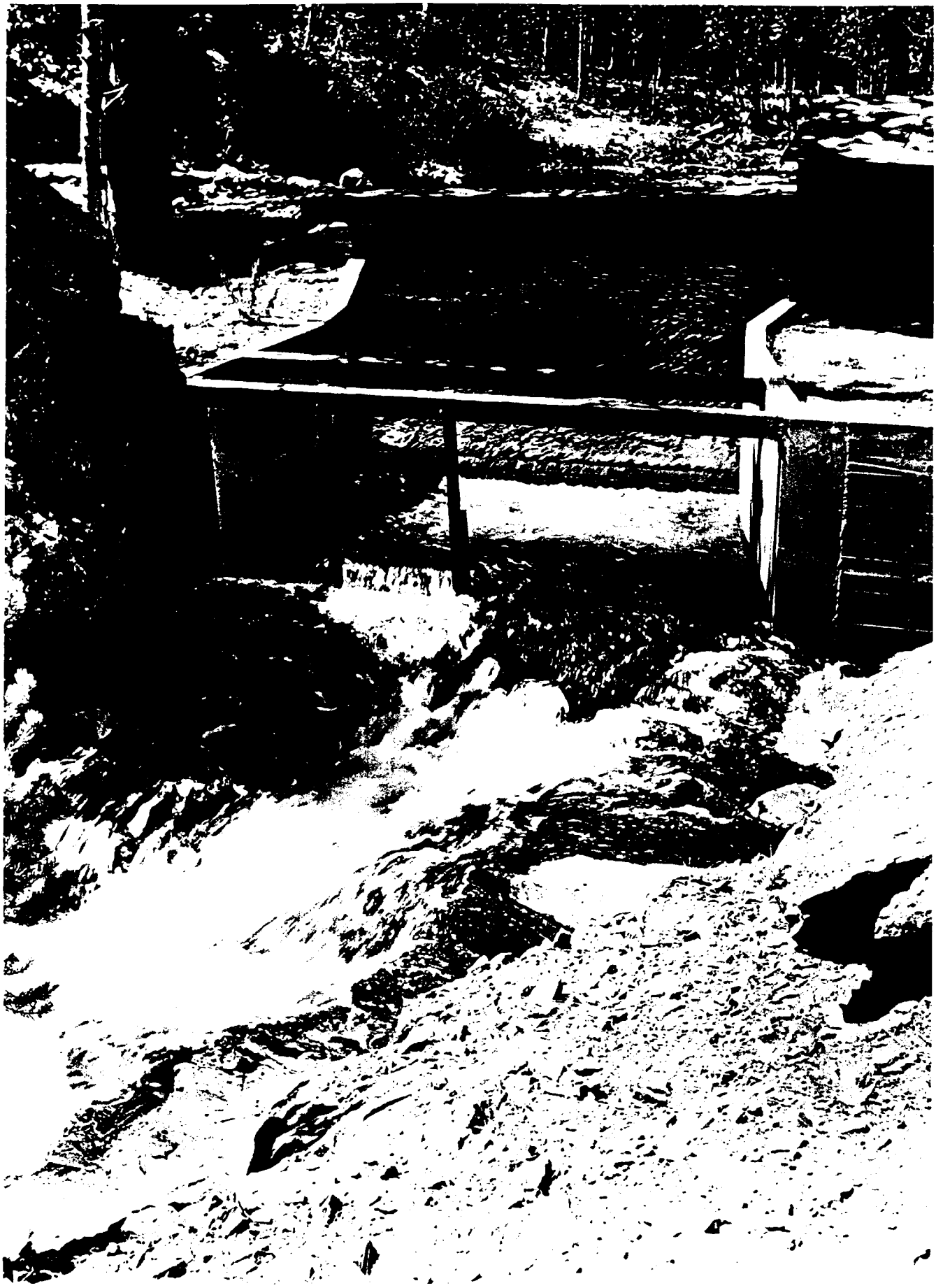
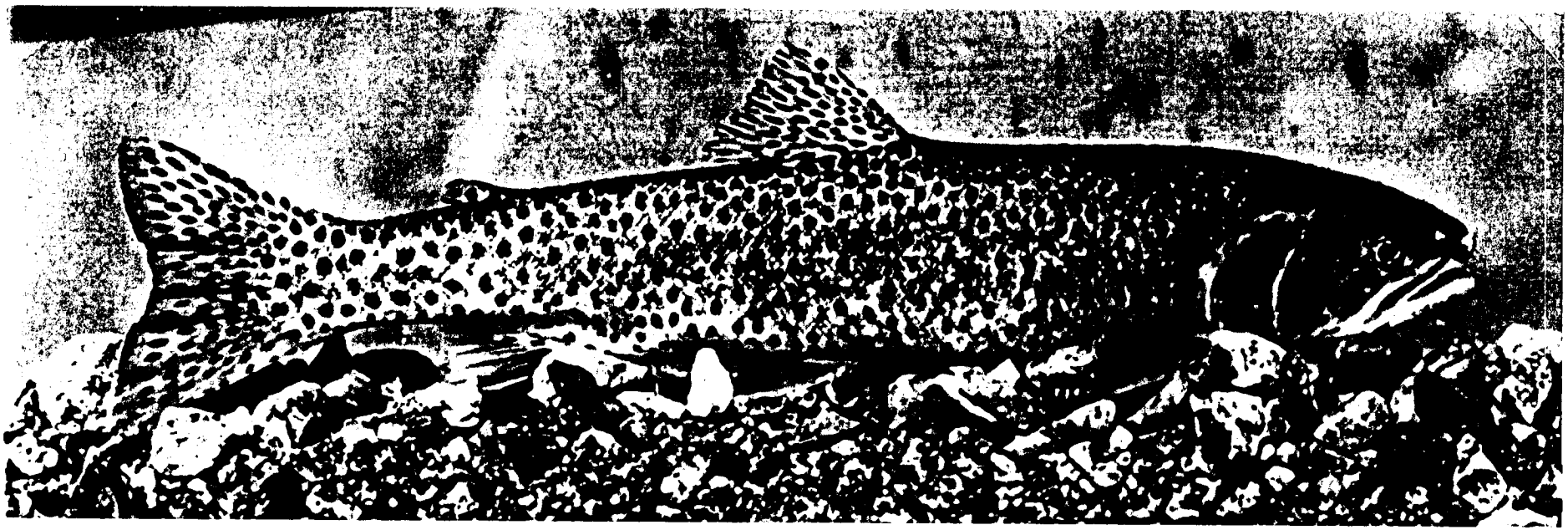


Photo of Rush Creek at L.A. Venturi Weir, beteween Silver and Grant Lakes, taken by Vestal in 1940. Shows water at flow of approximately 50 c.f.s.

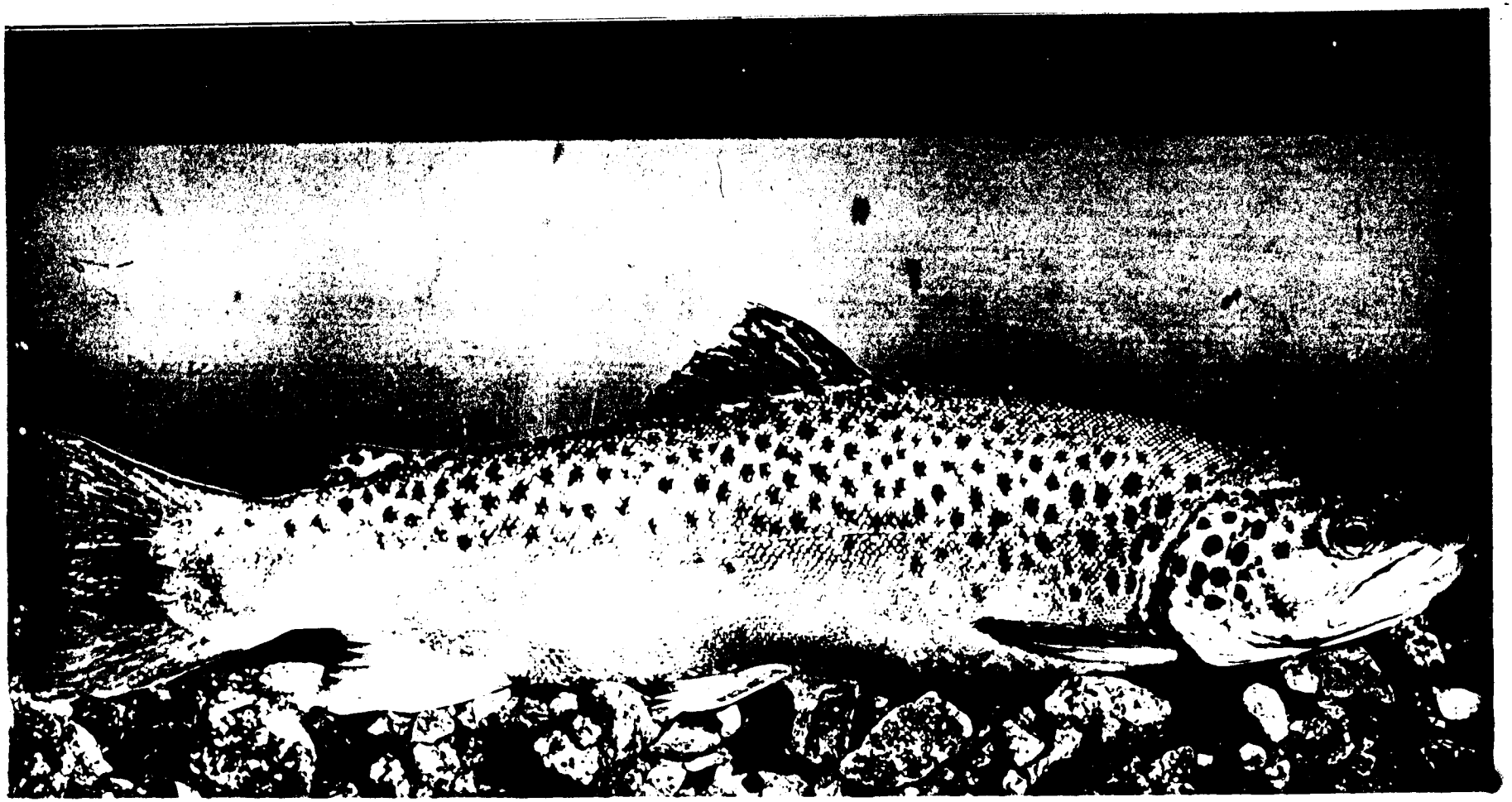
Photo of Rush Creek Egg-collecting Station for Brown Trout, below the L.A. Venturi Weir and Silver Lake, taken by Vestal on 10/16/39. Shows water at approximately 200 c.f.s. Demonstrates point that fish were so plentiful on Rush Creek that DFG set up an egg-collecting station to obtain eggs for distribution to other streams.



Black-spotted Trout (Salmo ~~Trutta~~ clarkii henshawi) "Jumbo"
taken at Upper Blue Lake, Alpine Co., 6-24-1940.
Photo by Elbert N. Vestal.

Photo of Cutthroat (Black-spotted trout), taken by Vestal at Upper Blue Lake on 06/24/40. Represents the typical size and condition of the cutthroats abundant in Rush Creek and commonly seen there by Vestal.

Photo of bend of Rush Creek below Gorge, 1 mile above the upper bridge, with hydrographer Claude James, taken by Vestel on 02/21/47. James recorded the water flow in the photo at 152 c.f.s. The photo shows a good fishing area with wonderful gravels of various sizes and riparian cover consisting of dense willows and cottonwoods.



Adult female Brown Trout, length 18 inches, photographed 10/16/39 at Rock Cr. Egg-Taking Station. Photo by Eddie N. Vestal—, in portable aquarium.

Eldred Vestal

Photo of 18 inch, adult female Brown Trout, taken by Vestal on 10/16/39. This trout was taken from Rush Creek at the Rush Creek egg-collecting station and is representative of the fish found in that Creek.

Photo of Rush Creek at delta entering Mono Lake, taken by Vestal on 02/21/47. Shows water at 170 c.f.s, with swirls, rises and deep pools.

①

Subject

Date 21 Feb 1947 Locality Rush Cr. Test Stream

22179 3-43 200 BKS OF 50 SPO

According to Mr. Claude James total flow at head of gorge about [illegible] approx. 15 second ft. including 14.3 CFS from Grant Lake. (Additional flow approx. [illegible] CFS). Gorge approx. 120 yds long & produced by ridge of granite running East & West across stream. Stream flow on [illegible] [illegible] ~~[illegible]~~ [illegible] with solid white [illegible] from head & foot of gorge. Av width 20'.
~~Sta~~ 1, ± 100 yds below end of gorge; Temp 43°F 12^40 P; pH 7.0; Clear; rapid; Av width 25 ft; excellent gravel; O_2 = 8.6 p.p.m.;
Sta 2: approx 1 mi below gorge; Temp. 12^55 P. 45°F. Av. width 20 ft; fast; excellent gravel; willows & cottonwoods; pH 7.2; O_2 = 8.6
Sta 3: at Ford. Temp 47°F (1^20 P); Av. width 30 ft; rapid;

Notes made by E.V. Vestal

②

Subject

Date 21 Feb 1947 Locality Rush Cr. Test Sta. (cont'd)

22179 3-43 200 BKS OF 50 SPO

pH 7.2; O_2 = 10.6 p.p.m.; banks; willows with section open places for fishing accessibility.
Sta 4: 200 yds above mouth; Temp 2^15 P 47°F;
Stream less rapid; Av. width 40 ft; pH 7.2; ~~O_2~~ 8.3 p.p.m.
Stream slightly murky; section here open & entirely accessible to [illegible] on East side.
1" = 2000'
9.8" (map measure) = 19,600' or 3.7 miles

Notes made by E.V. Vestal

00 027

Elden H. Vestal

Typed Translation of Attached Field Notes

Date: 21 Feb. 1947 Locality: Rush Creek Test Stream

According to Mr. Claude James, total flow at head of gorge above date approx. 152 second ft. including 143 cfs from Grant Lake. (additional below approx. 18 cfs). Gorge approx 120 yds long and produced by ridge of granite running East and West across stream. Stream flow on above date torential with solid white cataract from head to foot of Gorge. Avg. width 20 ft.

Station 1, +/- 100 yds below end of Gorge; Temp. 43 degrees F, 12:10 p.m.; pH 7.0; clear; rapid; AV width 25 ft; excellent gravel; Oxygen = 8.6 p.p.m.;

Station 2: approx. 7 mi below gorge; Temp. 12:55 p.m., 45 degrees F; AV width 20 ft; fast; excellent gravel; willows and cottonwoods; pH 7.2; Oxygen 8.6.

Station 3: At Ford. Temp. 47 degrees F (1:50 p.m); Av. width 30 ft; rapid; pH 7.2; Oxygen = 10.6 p.p.m.; banks; willows with scattered open places for fishing accessibility;

Station 4: 200 yds above mouth; Temp 2:35 p.m. 47 degrees F; stream less rapid; AV width 40 ft; pH 7.2; Oxygen 8.3 p.p.m.; stream slightly murky; section here open and entirely accessible to Lake on East side.

1 inch = 2000 ft.
9.8 inches (map measure) = 19,600 feet or 3.7 miles

Photo of Rush Creek in area moving out of the meadows and into the delta, with downstream weir and fishtrap, taken by Vestel on 04/10/47. Shows water at 20 c.f.s, with good riparian cover, pools and gravels. This photo presents a severe contrast to a photo taken in the same area in 1986.

Photo of single angler fishing one-half mile above upper bridge, taken by Vestel on 05/02/48. Demonstrates use of the stream by anglers. Shows water at approximately 20 c.f.s., beautiful gravels, and some indiction of the jungle of riparian cover in the dense patches of willow and extensive grasses.

STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES
KENNETH I. FULTON, DIRECTOR

THIRTY-SEVENTH BIENNIAL REPORT

OF THE DIVISION OF

FISH AND GAME

FOR THE YEARS 1940-1942

fish—information which is more important in fisheries management than the absolute values.

TABLE III

ESTIMATED TOTAL CATCHES OF INLAND WATER FISH

	1935[1]	1936	1937[2]	1938	1939[2][3]	1940	1941[3]
Number of licensees	223,098	298,736	312,969	346,561	366,452	388,472	458,177
Trout: Catch	11,700,000	12,000,000	11,900,000	12,900,000	12,500,000	-------	15,700,000
Successful anglers	142,000	149,000	151,000	160,000	179,000	-------	238,000
Average catch	81	80	78	79	71	-------	66
Striped Bass: Catch	-------	2,130,000	2,070,000	1,970,000	1,900,000	-------	2,035,000
Successful anglers	-------	85,000	83,000	94,000	91,000	-------	111,000
Average catch	-------	25	25	21	21	-------	18
Black Bass: Catch	-------	930,000	849,000	1,190,000	1,340,000	-------	1,529,000
Successful anglers	-------	34,400	32,700	45,300	67,000	-------	75,400
Average catch	-------	27	26	26	20	-------	20.3
Crappie: Catch	-------	1,040,000	917,000	1,210,000	1,720,000	-------	2,177,000
Anglers	-------	23,300	24,100	28,200	52,200	-------	69,700
Average catch	-------	47	38	43	33	-------	31
Sunfish: Catch	-------	590,000	1,164,000	934,000	2,090,000	-------	2,771,000
Anglers	-------	10,900	22,700	17,000	51,000	-------	62,500
Average catch	-------	54	51	55	43	-------	44
Salmon: Catch	-------	196,000	160,000	173,000	215,000	-------	253,000
Anglers	-------	24,600	20,000	22,300	30,700	-------	37,800
Average catch	-------	8	8	8	7	-------	6.7
Catfish: Catch	-------	2,040,000	2,810,000	3,480,000	4,230,000	-------	6,100,000
Anglers	-------	37,700	43,200	48,300	74,600	-------	97,400
Average catch	-------	78	65	72	58	-------	63

[1] Estimates were not prepared for other species than trout in the 1935 catch.
[2] 1937 estimates are derived from "First" and "Second" Call combined.
[3] 1939 and 1941 figures derive from mailed questionnaire instead of license application form; also, the method of estimate is different. As a result, the estimates for trout catch and anglers are lower than they would have been by the old methods (which would have given 19,000,000 trout caught by 256,000 anglers for an average of 74 trout per angler). At the same time, the estimates for minor species are increased, due to the tendency of reporters to give more complete records on the mailed questionnaire than on the application form.

TABLE IV

LEADING COUNTIES OF TROUT CATCH

Showing Rank in Each Year

	1936	*1937**	*1938*	*1939***	*1941***
Mono	1	1	1	1	1
Inyo	2	2	2	2	2
Fresno	5	6	7	6	3
Plumas	4	3	4	3	4
Humboldt	6	4	3	4	5
Tulare	8	15	9	7	6
Mendocino	7	7	11	9	7
Tuolumne	11	19	10	10	8
Shasta	15	8	8	5	9
El Dorado	3	9	5	11	10
Siskiyou	18	5	12	8	11
San Bernardino	10	10	29	20	12

* By "First" and "Second" Call combined—1937.
** Postal card questionnaire—1939 and 1941.

The statistical department of the Division of Fish and Game, thanks to its excellent personnel and equipment, is able to produce reports giving from all angles information on the number of fish of each kind caught in each county by residents of every county in the State. These detailed data have many uses. They are available in annual catch record reports, but are too lengthy to present here. Only the major results are summarized in the accompanying tables. Certain clarifying comments seem desirable.

1. The 1940 catch has not yet been analyzed. Reported on the old application blank system while the new mailed questionnaire was being

tested out on the 1939 catch, the 1940 individual reports reached the statistical department at the same time as the 1941 returned questionnaires, and it was thought desirable to put them aside in favor of the more up to date material. They will be recorded later as time becomes available.

2. As the number of licensees has increased, the percentage of them who fish for trout has remained comparatively constant at between 55 and 60 per cent (59.7 per cent in 1941). The total trout catch has increased, but the average catch per angler has declined. Part of this decline is due to the difference between the estimates derived from the license application reports (1935-1938) and from the mailed questionnaire (1939 and 1941) but part of it is significant. There were not as many trout available per angler in 1941 as in 1935; or, to put it differently, there has not been a rapid enough increase in the State's trout population to provide the same average catch per angler, although there has been a definite increase in the total number of trout taken.

3. The percentage of all licensees who fish for striped bass has shown a steady decline from 32.5 per cent in 1935 to 28 per cent in 1941. The total number of anglers for this fish has increased, but the total catch has remained quite constant. The decrease in the average catch per angler is not, in itself, evidence of depletion as long as the total number of fish taken does not decrease as the number of anglers increases.

4. The great increase in the reported numbers of crappie, sunfish and catfish after 1938, and especially in 1941, is probably due in large part to the new system of collecting the data and in part to the increased fish rescue program since 1938. All evidence points to the fact that on the mailed questionnaire, filled out at leisure and in private, the angler is more apt to count and report his catch of these comparatively minor species than he was on the old application form filled out at the time of buying his license.

It is evident from the foregoing statistics of the anglers' catch records for trout that more trout will have to be reared and planted if we are to keep pace with the increasing demands for that type of fishing. In the last biennial report attention was called to the need for certain changes and additions to the present facilities for rearing trout. A program was outlined for the construction of new hatcheries with particular emphasis on the need for rearing ponds to supply trout of catchable size for planting.

This program has in part been put into effect through the establishment of new stations and the addition of facilities at existing hatcheries. At Hot Creek, in Mono County, temporary ponds had been in use since 1931 and it had been demonstrated that the water at a temperature of approximately 60 degrees made possible a rapid growth that could hardly be duplicated any other place in the State.

The need for permanent and expanded construction there coincided with the construction of two large dams in the area by the City of Los Angeles. At neither of these dams did it appear that fish ladders would be practical and as provided by Sections 526 to 529 of the Fish and Game Code a request was made to the city for fish cultural facilities in lieu of ladders over the two dams. After negotiation the city agreed to provide the hatchery site of about 140 acres, the use of all water arising on the property, and the sum of $25,000 for construction. Since the hatchery was planned of a size to serve a greater area than that affected by the

construction of the two dams, the Fish and Game Commission provided an additional $100,000 for construction work. During the summer of 1941 the construction was carried forward to completion consisting of 30 ponds, a 30-trough hatchery, a spawning house and holding raceways, a six-car garage and workroom, a food house with refrigerating room, and three houses for employees.

Even during construction the use of temporary ponds and existing equipment made it possible to rear and plant 793,988 trout averaging 4.5 inches in length. With the new facilities in use it will be possible to materially increase this production both in the size and number of the fish produced.

The production of larger trout for Mono and Inyo counties, the two leaders in that type of fishing in the State, was further increased in 1942 by the operation of the Black Rock rearing pond near Independence, see Figure 2. This pond was artificially created some years ago by the City of Los Angeles by the building of a dam for diversion purposes near the

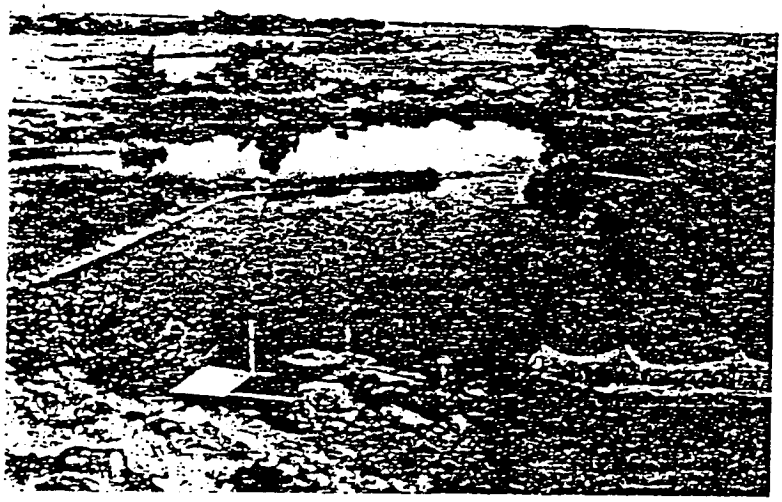


FIG. 2. Black Rock Springs Rearing Pond, Inyo County. Photo by E. H. Vestal.

source of the Black Rock springs. The springs have a flow of from 12 to 15 c.f.s. at a temperature of 59°. In the fall of 1941 the outlet to the pond was screened and 450,000 fingerling Rainbow trout were planted in this single large pond. Some risks were obviously involved in rearing such a large number of fish in a single pond but that they were justified can be seen from the results obtained. During the spring of 1942 a total of 274,385 Rainbow trout averaging over five inches in length and having a total weight of over 36,000 pounds was planted from the pond. These fish were for the most part used in stocking the heavily fished waters from the foot of Sherwin grade south to Lone Pine.

JOSEPH H. WALES, Biological Surveyor.

1. Progress Report of Trout Hatchery Experiments, 1940. April 7, 1941. 15 pp.
2. Summary of Weekly Disease Reports for 1940. April 9, 1941. 11 pp.
3. Observations on a Klamath River Fish Screen. May 19, 1941. 2 pp.
4. Canadian Creek (Trinity River) Diversion Dam. May 30, 1941. 2 pp.
5. Progress Report of Trout Hatchery Experiments, 1941. Nov. 1941. 12 pp. plus graphs.
6. Development of Steelhead Trout Eggs, Cal. Fish & Game, Vol. 27, No. 4, pp. 250-260. 3 plates.
7. Carp Control Work in Lake Almanor, 1941. Cal. Fish & Game, Vol. 28, No. 1, pp. 28-33. 3 figs.
8. Castle Lake Report for 1941. Feb. 1942. 40 pp. 24 figs.
9. Mt. Shasta Rainbow Egg Selection. Mar. 27, 1942.
10. Progress Report of the 1941 Squaw Creek Creel Census. Mimeographed by U. S. Forest Service. May 15, 1942. 15 pp. 1 map.
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12. Shasta River Irrigation Ditch Fish Screen Report. June, 1942. 8 pp. 1 sketch.
13. The Non-Migratory Rainbow Problem. Feb. 10, 1941. 7 pp.

ELDEN H. VESTAL, Junior Aquatic Biologist.

1. Treatment with Rotenone of Pond Systems and Water Supplies at Hot Creek State Hatchery for Control of Ichthyopthirius. Parts I and II. Reports prepared with R. C. Lewis, Hatchery Foreman.
2. Rough Fish Control in Gull Lake, Mono County, California. Cal. Fish & Game, Vol. 28, No. 1, pp. 34-61, April, 1942.
3. Report on the Gull Lake Fisheries Project for 1941. May, 1942.
4. Preliminary Report on Proposed Improvement of Silver Lake, Mono County, Fishery. June 23, 1942.
5. Reclamation with Rotenone of Crystal Lake, Los Angeles County, California. Cal. Fish & Game, Vol. 28, No. 3, pp. 136-142. July 1942.
6. Creel Returns and Trout Production in June Lake, Mono County, California, 1939-1941. 1942.

CHESTER WOODHULL, Junior Aquatic Biologist.

1. A Report on the Kern River Small Mouthed Bass. Nov. 15, 1941.
2. Supplementary Report No. 1 to a Report on the Kern River Small Mouthed Bass. Nov. 21, 1941.
3. The Inland Mullet Fishery of California, Preliminary Report No. 1. May 13, 1942.

A. J. CALHOUN, Student Biologist.

1. The Biology of the Black Spotted Trout in Two Sierra Lakes. July, 1942.

GARTH MURPHY, Student Biologist.

1. Relationships of the Freshwater Mussel to Trout in the Truckee River, Cal. Fish & Game, Vol. 28, No. 2, pp. 89-102. April 1942.

One of the most interesting new methods in fishery management is the use of the organic poison, rotenone, for the removal of undesirable fishes from lakes and streams.[1] During the biennium the biological staff has made extended use of this material with success. Although detailed reports have been published in CALIFORNIA FISH AND GAME, a brief summary of all of the work of this sort done so far is given herewith.

Rough fish, such as carp, goldfish and minnows often live together with trout without causing trouble. However, in some cases the balance is upset, and they become so numerous in a body of water that practically no trout remain. The only remedy then is to remove all fish and start again. One of the most effective agents for such an operation is rotenone, a poisonous constituent of derris, timbo, cube and other insecticide

[1] Pioneer work in the application of rotenone to the control of rough fish was done at the Michigan Institute for Fisheries Research. See Leonard, Justin W., Notes on the Use of Derris as a Fish Poison, Transactions of the American Fisheries Society, Vol. 68, pp. 269-280, 1939.

powders. In very dilute concentrations (1:2,000,000) this kills fish without being injurious to plant life, to many forms of fish food, or to human beings and other mammals. Six bodies of water in California have been subjected to this treatment by the Bureau of Fish Conservation in the last two years, and are listed below.

Gull Lake, Mono County. This 70-acre lake, once an excellent trout fishery, had become overrun with lake chubs. The lake was poisoned with timbo on September 11, 1940. An estimated 500,000 chubs were killed, of which all but 100,000 were over two inches long. Only 254 trout were found in the lake. It was restocked November 1st to 4th, some 50 days after the treatement, with 76,000 eastern brook trout five inches long. The catch the following season (1941) is estimated at over 10,000 trout.

Hume Lake, Fresno County. Deterioration of trout fishing in this 94-acre reservoir had been ascribed to the number of minnows present and had led to requests for remedial measures. Draining of the water by the United States Forest Service in early October, 1940, in order to repair the dam removed a large proportion of the rough fish, and on October 10th poisoning with timbo of the remaining pools and springs on the lake bottom, and of the tributary streams, was undertaken. The complexity of the operation made estimates difficult, but it is reported that great numbers of the minnow *Lavinia exilicauda* were destroyed. The lake was restocked in late November with four-inch rainbow and satisfactory fishing was reported the following season.

Thompsons Lake, Plumas County. This two-acre lake lies 500 feet above and one-quarter mile from Bucks Lake, an excellent trout fishing water. Black bass placed therein by unauthorized persons constituted a menace to trout due to the possibility of their migrating down into Bucks Lake in the overflow from Thompson's which occurs after heavy winters. The lake was poisoned with timbo October 16, 1940, and 1,000 large-mouthed black bass and 27 Lock Leven trout were destroyed. This lake was not restocked; serving as domestic water supply for local cabin owners, the presence of fishermen on its shores was not desired.

Lake Almanor, Plumas County. Carp present in this lake had been blamed by fishermen for deterioration in the rainbow fishing. Although no positive evidence of this exists, it was decided to experiment with carp control during May and June of 1941. At this season the carp come into the shallow bays to spawn. It was found that the best results were obtained by spreading a strong solution of timbo across the mouth of a bay which carp had entered, and then working back toward the head of the bay. As the fish tried to escape they were killed passing through the timbo barrier, and it is estimated that from 10,000 to 12,000 were disposed of in this way in the course of the season. Some minnows were killed but, so far as is known, only one small trout. Trout do not frequent the warm shallows where the carp spawn.

Hot Creek Hatchery Water Supply, Mono County. Infections of rainbow trout at this hatchery with *Ichthyopthyrius* having caused considerable losses in the past, it was decided to try to destroy all fish in the springs which form the water supply in the hope that elimination of these hosts for the parasite would do away with the disease. A great difficulty lay in the fact that the water issues from caves which extend far back under the ground, thus making it impossible to poison the actual

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

Hatchery	County	Total from county by hatchery	Rainbow	Steelhead
ALPINE	Alpine	500,990	51,000	
	El Dorado	55,000		
ARROWHEAD LAKE	Los Angeles	38,273		
	Riverside	15,000	5,000	
	San Bernardino	96,500	40,000	
BASIN CREEK	Alpine	123,750	93,270	
	Calaveras	568,750	222,125	
	Tuolumne	955,195	412,595	
BEAR RIVER PLANTING BASE	El Dorado	25,460	25,460	
	Nevada	1,105,814	469,116	
	Placer	786,178	577,569	
	Sierra	116,244	116,244	
BROOKDALE	Alameda	6,615	6,615	
	Marin	50,249	50,249	
	Monterey	167,585	86,907	50,975
	Napa	5,190	5,190	
	San Benito	9,525	9,525	
	San Francisco	3,200	200	3,000
	San Luis Obispo	15,470	15,470	
	San Mateo	102,353	6,363	95,990
	Santa Clara	82,041	50,989	31,052
	Santa Cruz	336,252	24,475	311,777
	Solano	7,506	7,506	
BURNEY CREEK	Lassen	234,000	90,000	
	Modoc	529,000	224,000	
	Shasta	1,937,900	1,155,500	
	Siskiyou	40,000		
CHINO RESERVOIR	Los Angeles	6,500	6,500	
	San Bernardino	15,000	15,000	
EXPERIMENTAL	Siskiyou	21,966	7,305	125
FALL CREEK	Siskiyou	5,500,251		1,367,321
FEATHER RIVER	Butte	3,000	3,000	
	Plumas	956,091	331,035	
	Sierra	278,729	110,780	
FERN CREEK	Fresno	77,315	77,315	
	Inyo	23,306	23,306	
	Madera	161,566	161,566	
	Mono	256,078	256,078	
FILLMORE	Santa Barbara	8,900	200	8,700
	Ventura	46,500	43,150	3,350
FOREST HOME	Los Angeles	19,000	19,000	
	San Bernardino	50,360	50,360	
	San Diego	3,000	3,000	
FORT SEWARD	Humboldt	774,047		205,642
	Mendocino	74,469		74,469
	Trinity	91,601		91,501
HOT CREEK	Inyo	67,370	67,370	
	Madera	41,000	41,000	
	Mono	602,951	453,825	
HUMBOLDT STATE COLLEGE	Humboldt	9,477		
HUNTINGTON LAKE	Fresno	292,049	164,089	
KAWEAH	Tulare	896,680	377,380	
KERN	Kern	34,878	13,686	
	Tulare	147,131	125,066	
KINGS RIVER	Fresno	1,177,313	972,369	
LAKE ALMANOR	Butte	27,500		
	Lassen	373,610	81,600	
	Plumas	1,095,320	676,460	
	Shasta	43,500	39,500	

AND GAME. RECORD OF FISH DISTRIBUTION—1940

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
	573,890			176,100					
	55,000								955,990
			38,275						
			10,000						
			26,800						123,075
				30,490					
			345,525						
			423,150	149,120					1,677,705
			322,316	313,582					
			117,290	71,314					2,016,691
									799,287
			90,000	54,000					
			210,000	95,000					
			525,000	257,300					
				40,000					2,740,900
									24,500
			7,513	7,020					21,966
					4,132,430				5,500,251
			411,900	213,156					
			106,440	61,500					1,237,811
									518,265
									65,400
									72,360
					468,405				
									940,117
			4,934	144,192					711,321
						9,477			9,477
				127,960					292,049
			271,300	247,500					896,580
			21,192						
			22,065						182,009
			96,946	107,498					1,177,313
				27,500					
			127,000	164,670		340			
			224,910	55,000		139,450			
				4,000					
				70,000					1,610,430

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

Hatchery	County	Total from county by hatchery	Rainbow	Steelhead
ALPINE	Alpine	993,978	36,644	
ARROWHEAD LAKE	Los Angeles	70,000	15,000	
	Orange	5,000	5,000	
	Riverside	42,000	12,000	
	San Bernardino	113,400	38,400	
	San Diego	43,000	43,000	
BASIN CREEK	Alpine	51,000	25,000	
	Amador	90,245	32,880	
	Calaveras	439,325	257,580	
	Tuolumne	576,080	601,200	
BEAR RIVER PLANTING BASE	Nevada	1,202,670	464,416	
	Placer	537,559	363,451	
	Sierra	60,516	60,516	
BROOKDALE	Marin	39,988	39,988	
	Monterey	150,520	36,469	94,051
	San Benito	10,080	10,080	
	San Luis Obispo	10,376	10,376	
	San Mateo	96,563	11,088	55,555
	Santa Clara	33,180	33,180	
	Santa Cruz	370,433	25,953	322,755
	Solano	15,000	15,000	
BURNEY CREEK	Lassen	207,000	207,000	
	Modoc	470,000	319,500	
	Shasta	1,251,900	972,900	
	Siskiyou	47,000		
EXPERIMENTAL	Shasta	14,630	14,630	
	Siskiyou	14,590	7,380	
FALL CREEK	Siskiyou	6,379,600		1,403,500
FEATHER RIVER	Plumas	690,239	333,723	
	Sierra	220,535	90,435	
FERN CREEK	Madera	82,076	82,076	
	Mono	49,777	34,377	
FILLMORE	Los Angeles	54,073	54,073	
	San Bernardino	4,126	4,126	
	San Diego	10,000	10,000	
	Santa Barbara	3,342	3,342	
	Ventura	22,723	22,723	
FORT SEWARD	Humboldt	502,408		227,560
	Mendocino	167,320		167,320
	Trinity	63,510		63,510
HOT CREEK	Inyo	92,500	85,500	
	Madera	46,000	46,000	
	Mono	636,458	543,873	
HUMBOLDT STATE COLLEGE	Humboldt	6,240		
HUNTINGTON LAKE	Fresno	191,097	115,515	
KAWEAH	Tulare	900,975	495,650	
KERN	Kern	45,700	23,151	
	Tulare	197,349	176,580	
KINGS RIVER	Fresno	961,592	640,570	
LAKE ALMANOR	Butte	15,000		
	Lassen	333,600	240,700	
	Modoc	1,600	1,500	
	Plumas	827,400	852,900	
	Shasta	88,200	58,200	
	Tehama	53,000	15,000	
MADERA	Madera	467,759	197,410	

AND GAME. RECORD OF FISH DISTRIBUTION—1941

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Kokanee Salmon	Miscellaneous	Total
	303,334			103,500					993,978
			55,000						
			30,000						
			75,000						
									273,400
				25,000					
			134,465				67,365		
			154,500	120,250					1,439,650
			425,234	313,020					
			107,593	66,315					
									1,301,345
						14,685			
									726,640
			20,000						
			100,000	51,000					
			177,000	102,000					
				47,000					1,995,900
				7,010					29,520
					4,976,000				6,379,600
			181,900	174,660					
			55,000	75,200					910,924
			15,200						131,553
									94,264
					574,728				
									1,033,238
				7,000					
				92,585					774,958
						6,240			6,240
				75,582					191,097
			233,600	171,725					900,975
			22,549						
			20,769						243,049
			181,659	139,663					961,892
				15,000					
			40,200	57,700					
			123,500	51,000					
			4,000	26,000					
				40,000					1,325,800
			128,930	141,419					467,759

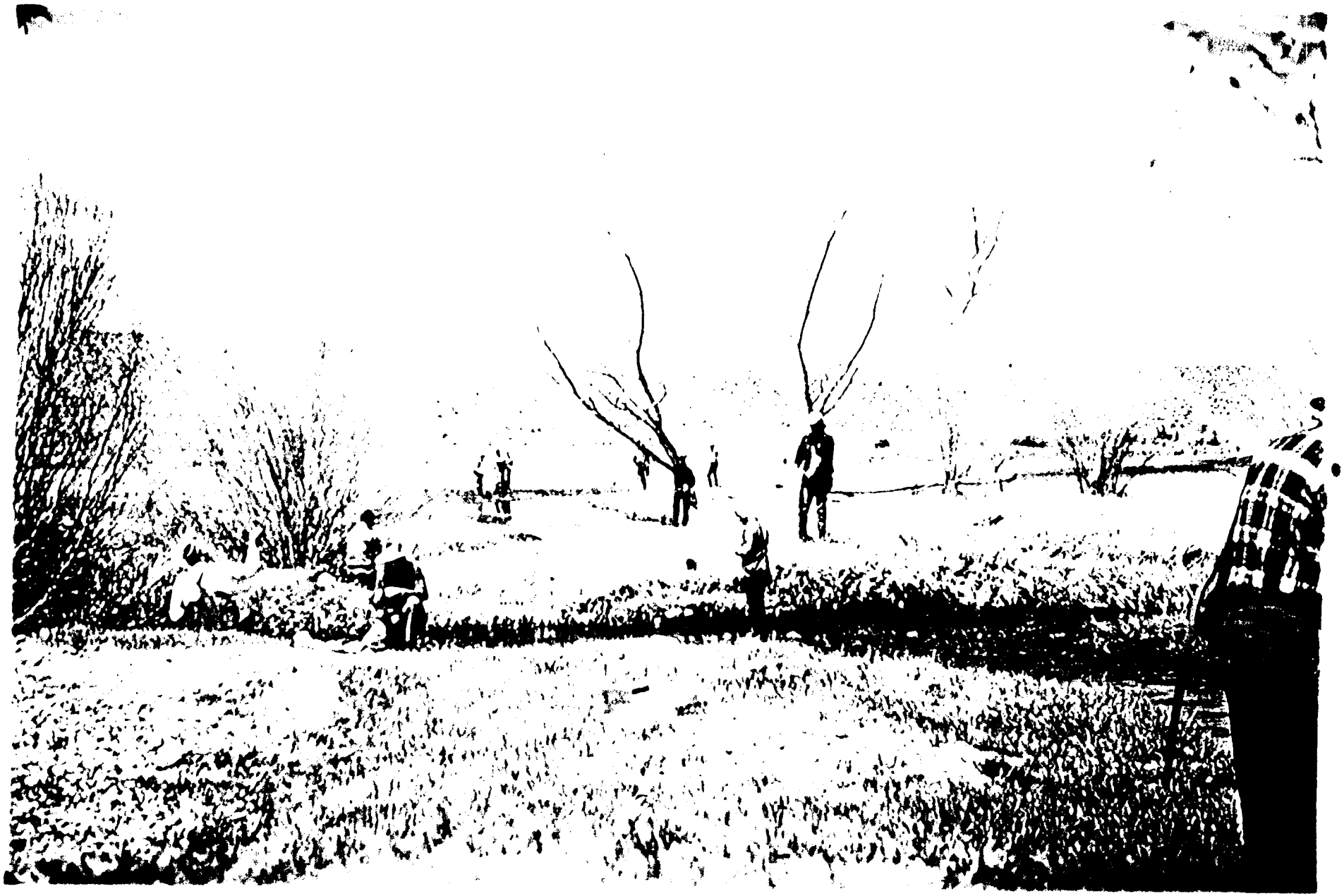

Photo of 12 anglers fishing the meadow section of Rush Creek, taken by Vestel on 05/02/48. Demonstrates the popularity of the stream with anglers.

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CREEL RETURNS FROM RUSH CREEK TEST STREAM, MONO COUNTY, CALIFORNIA, 1947-1951

ELDEN H. VESTAL

Inland Fisheries Branch, California Department of Fish and Game

CREEL RETURNS FROM RUSH CREEK TEST STREAM, MONO COUNTY, CALIFORNIA, 1947-1951[1]

ELDEN H. VESTAL

Inland Fisheries Branch, California Department of Fish and Game

INTRODUCTION

The rise in angling pressure on California's roadside trout waters since 1944 has been tremendous. Poorer catches have been accompanied by demands from the angling public for increased plants of catchable trout.[2] In response to these demands the California Department of Fish and Game is rapidly expanding hatchery production of "catchables." It is vitally important to get the greatest possible number of these expensive fish back into the anglers' creels. The Rush Creek experiments were designed to find out how this could be done in a representative stream in the great Inyo-Mono recreation area.

The experiments of the first five years, 1947 through 1951, dealt primarily with catchable rainbow trout. Smaller rainbow and brown trout were also planted during the first three years to determine their survival to following seasons, and to learn if such plants were more economical, in terms of fish in the angler's creel, than in-season plants of catchable trout.

This paper marks the completion of the rainbow trout phase of the project, the first four years of which were under the direction of the writer. Comparable experiments with brown trout are now under way.

DESCRIPTION OF THE TEST STREAM

The lower portion of Rush Creek was in many ways ideal for use as a test stream. Its location (Figure 1) in the Inyo-Mono vacationland only three miles from U. S. Highway 395 assured both heavy fishing and ready accessibility for planting. The stream was fairly typical of heavily fished trout streams on the east slope of the Sierra Nevada. Absence of tributaries prevented emigration of planted trout. The section available was large enough for heavy planting and yet, with but one access road, could be controlled from a single checking station with a minimum of personnel and facilities.

Rush Creek Test Stream is located in central Mono County of eastern California, four miles east of Lee Vining, about 10 miles east of the eastern boundary of Yosemite National Park, 67 miles north of Bishop, and 330 miles by good highway from Los Angeles. It includes 3.7 miles of lower Rush Creek from a rocky defile known locally as The Gorge downstream to the mouth of Rush Creek at Mono Lake (Figure 2).

[1] submitted for publication January, 1954.

[2] In California there is no minimum size limit. The term "catchable" applies in this paper to trout about seven inches in length (or longer).

Trout are unable to live in Mono Lake because of its extremely high salinity. Gill-netting and observations during 1947 failed to indicate any loss of fish to Mono Lake, but as a precaution a weir and trap were installed in the delta section of Rush Creek early in 1948 and thereafter checked after each planting. Upstream migration was prevented by a seven-foot high rock-masonry barrier built in the center of The Gorge early in 1947.

Since the construction in 1939 of Grant Lake Dam and the Mono Tunnel by the City of Los Angeles for diversion of Mono Basin water

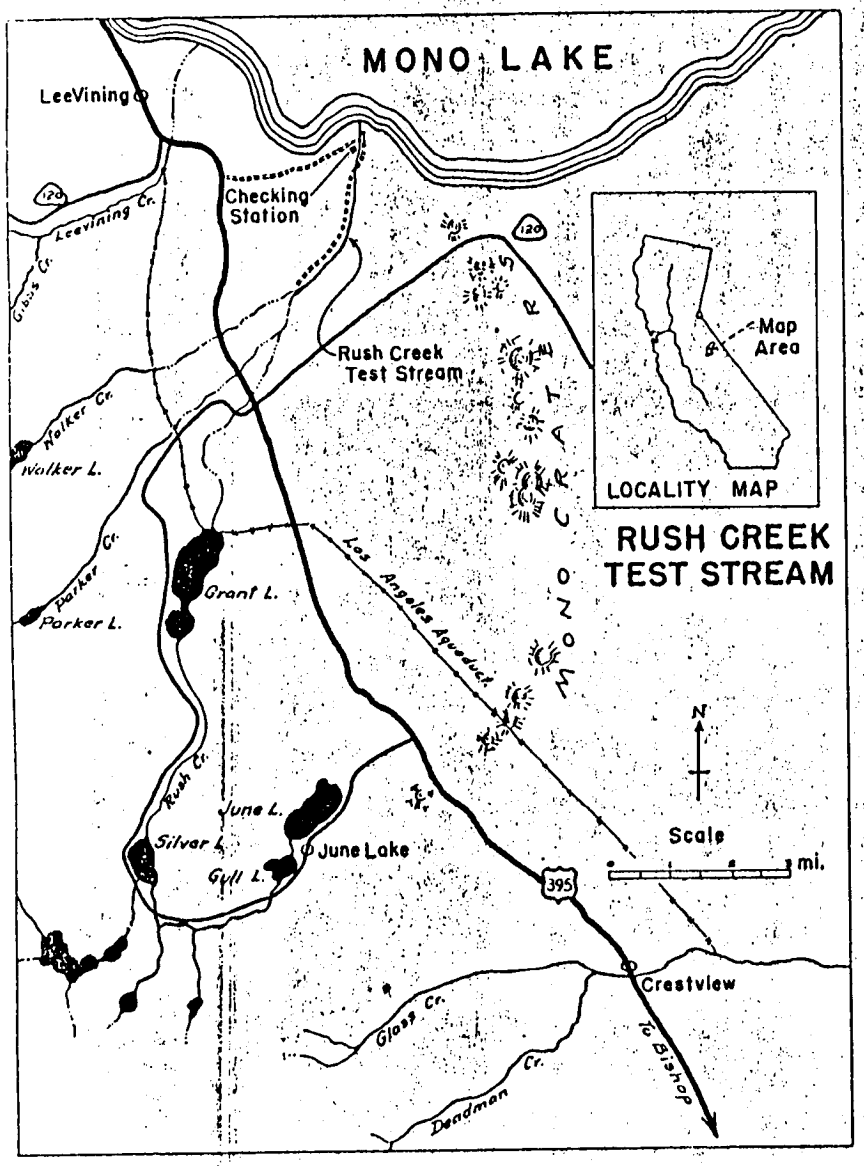

FIGURE 1. Location map of Rush Creek Test Stream, Mono County, California.

into the Los Angeles Aqueduct system, the natural flow in Rush Creek has been controlled and diverted. Tributaries of Rush Creek below the dam have also been diverted, by means of the Mono Basin Aqueduct. Since 1947 the City of Los Angeles has released no water into Rush Creek from Grant Lake Dam during the entire trout season. As a result the test stream at the upstream barrier was completely dry by late August in 1948 and by mid-July in 1949, and the entire summer flow has been supplied by the springs just below this barrier. Without water

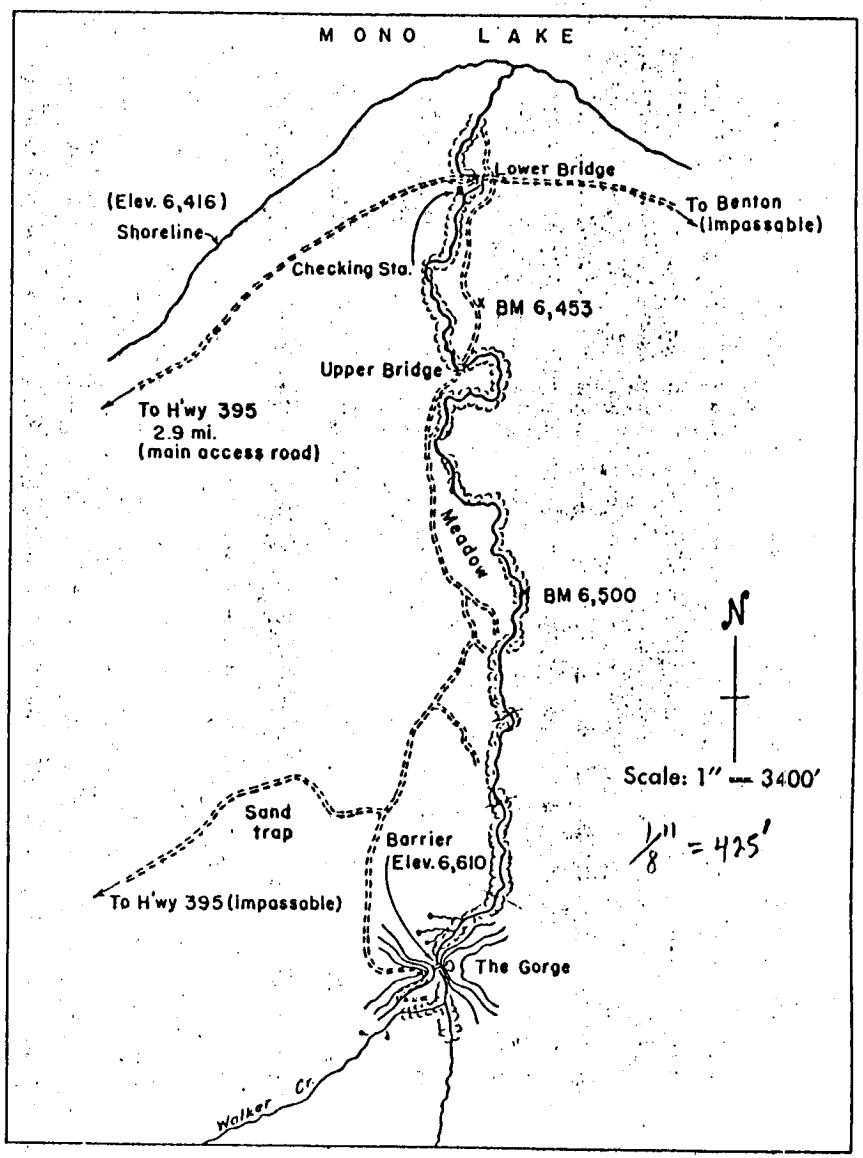

FIGURE 2. Map of Rush Creek Test Stream, Mono County.

to replenish water tables in the valley floor, these springs have declined steadily; the minimum flow in the test stream has fallen from 24 c.f.s. in 1947 to 12 c.f.s. in 1948, 13 c.f.s. in 1949, and 2 c.f.s. in 1950 and 1951. Mean flow during the 1951 season was only 2.5 c.f.s.

Prior to diversion the flow in lower Rush Creek normally reached spring maximum of about 175 c.f.s., but in very wet years it rose to more than 300 c.f.s. Spring run-off from Parker and Walker Creeks supplied some 50 c.f.s. of this total, and most of the rest was overflow from Grant Lake.

Lower Rush Creek formerly averaged about 20 feet in width during the trout season, with a depth of some seven inches on the riffles and four or five feet in the long delta pools. By 1951, however, these dimensions had been reduced by more than two-thirds.

The temperature of lower Rush Creek fluctuates daily during the summer between about 50 degrees and 70 degrees F., with trout season extremes of 37 degrees and 72 degrees F. in 1948 (Table 1). As the

TABLE 1

Average and Range in Temperatures at Rush Creek Test Stream, Season of 1948

Month	Air temp., deg. F.	Stream temp., deg. F.
March	38.8 (20-55)	47.1 (36-59)
April	48.7 (33-68)	52.0 (40-65)
May	57.1 (35-78)	56.1 (40-69)
June	65.4 (47-83)	59.0 (47-71)
July	73.9 (61-87)	60.0 (46-72)
August	72.6 (59-83)	59.0 (48-70)
September	65.9 (36-85)	53.9 (42-65)
October	53.9 (28-73)	47.7 (37-58)

flow has declined temperatures have shown somewhat greater extremes. Air and stream temperatures were recorded at the checking station at 8 a.m., 12 noon, and 4 p.m. daily.

Winter temperatures are often severe, although snowfall is rarely great enough to bridge the stream.

The gradient of the test section is moderate, with an average fall of 52 feet per mile. Riffles containing excellent spawning gravels make up the bulk of the test stream; pools are comparatively scarce. Rubble and boulders are found in The Gorge, while the delta section contains thick deposits of lapilli and pumiceous dust derived from the Mono Craters (Russell, 1889).[3]

In general, life-zone characteristics are those of Great Basin Upper Sonoran (Figure 3).[4]

[3] The test stream has not changed its course since the Tahoe glacial period. Till deposits from the Tahoe and Tioga periods underlie the surface blanket of ash and pumice sand from the Mono Craters, which flank the drainage on the east side. Rush Creek Gorge was cut through a shallow rhyolitic cap, and the sediment created a small flood plain below, across which lower Rush Creek now flows.

[4] Chief plant association of the Mono Basin is comprised of Three-toothed Sage (*Artemisia tridentata*) and Bitter Brush (*Purshia tridentata*). Lower Rush Creek streamside cover is characterized by dense jungles of willows (*Salix* sp.) interspersed with Black Cottonwoods (*Populus trichocarpa*), though open stretches are found at intervals along the low banks of the stream (Figure 4). Jeffrey Pines (*Pinus ponderosa* var. *jeffreyi*), once common, are still present in the vicinity of The Gorge.

FIGURE 3. Rush Creek Test Stream project area looking northeasterly from The Gorge. Mon Lake and Paoha Island in the background. *Photograph by Elden H. Vestal, April 10, 1947.*

FIGURE 4. Rush Creek Test Stream, Mono County, California. Section one-half mile above t upper bridge. *Photograph by Elden H. Vestal, May 2, 1948.*

Predators common to many streams in California are found along the test stream.[5]

Grazing animals are a nuisance at intervals during the trout season. Some 4,000 sheep are watered along the stream, roiling the water and causing a temporary decline in catches and angling effort.

HISTORY OF TROUT IN RUSH CREEK

Originally there were no trout in any of the streams of the Mono Basin. The first plants were reportedly made about 1880, and according to the "old-timers" of Lee Vining cutthroat trout and steelhead [6] were present in lower Rush Creek around the turn of the century. Brown Trout (*Salmo trutta*) fingerlings were introduced some 15 miles above the mouth probably in July, 1919. Eastern Brook Trout (*Salvelinus fontinalis*) and Lahontan Cutthroat Trout (*Salmo clarki henshawi*) were planted in 1931 and 1932, but apparently had little effect on the brown trout population, which was by that time said to be producing excellent fishing in lower Rush Creek. The fingerling brown trout plants continued until 1942, after which they were replaced by annual plants of unmarked catchable Rainbow Trout (*Salmo gairdneri*) until 1947 (Table 2).

TABLE 2

Fish Planting in Lower Rush Creek, 1940-1946

Species	Size	Number planted							
		1940	1941	1942	1943	1944	1945	1946	Total
Brown trout	Fingerling	11,520	10,010						21,530
Rainbow trout	Catchable			2,000	3,000	3,170	3,202	2,520	13,892
Grand total									35,422

TEST STREAM MANAGEMENT

The Planting Program, 1947-1951

Large plants of catchable rainbow trout were made in the test stream during each of the five years of this census period (Table 3). All of these trout were fall-spawning rainbow [7] which averaged about six fish per pound or seven inches in length. All were marked by the removal of one or more fins. Generally five plants of equal size were made each year a few days before the expected vacation angling peaks: opening day (May 1 or Saturday nearest thereto), Memorial Day, the Fourth of July, the middle of August, and Labor Day.

[5] Mink (*Mustela vison*) and Coon (*Procyon lotor*) are present. The Pallid Great Blue Heron (*Ardea herodias treganzai*) is an occasional visitor; one killed October 29, 1947, contained 11 newly planted fingerling rainbow and a 10-inch brown trout. American Mergansers (*Mergus merganser americanus*) have also been seen occasionally along the test stream. Pied-billed Grebes (*Podilymbus podiceps*), Eared Grebes (*Colymbus nigricollis californicus*), and California Gulls (*Larus californicus*) occur along the shore of Mono Lake, and probably capture a few trout in the delta section. The Wandering Garter Snake (*Thamnophis ordinoides vagrans*) is common along the stream during the summer and may take a few trout.

[6] Probably Lahontan Cutthroat Trout (*Salmo clarki henshawi*) and Steelhead Rainbow Trout (*Salmo g. gairdneri*).

[7] A strain developed at Hot Creek State Hatchery, California, by selective breeding.

TABLE 3

Rush Creek Test Stream Marking and Planting Program, 1947-1951: Catchable Rainbow

	1947	1948	1949	1950	1951
Number planted	10,000	19,945	19,975	10,000	9,984
Mark (fins removed)	LV	RV	Both V	RV	Both V
Dates of planting	5/13, 5/28, 6/23, 7/14, 8/4	4/28, 5/26, 6/23, 7/21, 8/11	4/20, 5/20, 6/23, 7/15, 8/4, 8/20	4/28, 5/20, 6/23, 7/15, 8/9	4/20, 5/24, 6/28, 8/2, 8/30
Average size in:					
Number per pound	6	6.7	5.6	6	6.3
Inches	7	7	7-1/2	7	7

V = ventral fin; L = left; R = right.

The 1947 plant of 10,000 catchables was increased to 20,000 in 1948 and 1949 in order to test the effect of larger plants on individual catches and total yield. In 1950 and 1951 stocking was restored to the 1947 level.

Two additional size classes of trout were used in planting experiments of the first three years: "subcatchables" and "fingerlings" [8] (Table 4). These were also all marked by fin removal.

In 1947 and 1948 equal numbers of spring-spawned and fall-spawned subcatchable rainbow were planted late in the season in an attempt to learn which strain gave greater over-winter survival.

The 1948 and 1949 fingerling plants of rainbow and brown trout were made for a comparison of the return of the two species to the angler. The small fingerling rainbow planted in 1948 were typical of fingerling rainbow planted in California streams at the time.

Subcatchables and fingerlings were not planted in 1950 and 1951, to prevent confusion of fin marks and to provide opportunity for the earlier plants to exhaust themselves in the catch.

All plants were distributed more or less equally throughout the test section, with the exception of the extreme upper and lower one-half miles, which were not accessible to the planting trucks.

Regulations

The test stream was operated in accordance with California's general summer trout angling regulations:

Season—May 1st or Saturday nearest thereto through October 31st.
Fishing hours—one-half hour before sunrise to one-half hour after sunset.
Bag and possession limit—15 trout.
No minimum size limit.

With the following exceptions and special regulations:

In 1948 a three-day test stream closure followed each of the four in-season plants of catchable rainbow.
In 1951 the test stream was closed at 7 p.m. daily.
Throughout the project, camping was not permitted in the test stream area.

[8] The term "subcatchable" and "fingerling" apply in this paper to trout about four inches and two inches long, respectively.

TABLE 4

Rush Creek Test Stream Marking and Planting Program, 1947-1951: Fingerling Rainbow and Brown Trout and Subcatchable Rainbow

Date of planting	Species	Mark	Average size: Number per pound	Average size: Length in inches	Hatchery stock
Fingerlings					
July 14, 1948	Rainbow	Ad	30	1¾	Mt. Whitney spring-spawned
July 20, 1948	Brown	LV	25	1¾	Rush Cr.-Mt. Whitney
Aug. 26, 1949	Brown	RV	13	2¾	Rush Cr.-Mt. Whitney
Aug. 29, 1949	Rainbow	LV	12	2¾	Mt. Whitney spring-spawned
Subcatchables					
Sept. 27, 1947	Rainbow	Ad-LV	2,000	4	Mt. Whitney spring-spawned
Sept. 27, 1947	Rainbow	Ad-RV	2,000	4	Mt. Whitney fall-spawned
Oct. 13, 1948	Rainbow	Ad-D	4,000	4	Mt. Whitney spring-spawned
Oct. 13, 1948	Rainbow	Ad	4,000	4½	Mt. Whitney fall-spawned

Ad = adipose fin; V = ventral fin; D = dorsal fin; L = left; R = right.

Recording the Data

Information obtained from anglers upon arrival at the checking station included name, address, and time of arrival. A combined map and information circular describing the test stream was given to each registrant. Illustrated signs along the stream called further attention to the fact that all planted trout were marked, and to the need for a complete creel check. Road signs directing anglers to Rush Creek were set up on U. S. Highway 395 at the June Lake Junction and the turn-off to the test stream.

As anglers left the test stream the checker recorded the time of departure, calculated the elapsed fishing time, and tabulated all trout by species and mark.

A total of 12,298 cars registered at the checking station during the first four seasons. Only 13, a small fraction of one percent, failed to check out. Since it is virtually impossible to reach or leave the test stream without passing the checking station, the creel census was for all practical purposes complete.

CREEL RETURNS

Creel returns from the test stream for the five seasons, 1947 through 1951, are summarized in Table 5. The test stream was fished on 875 of a total of 911 days which made up five legal angling seasons. A total of 33,431 anglers fished 118,408 hours and caught 65,935 wild and planted trout, 6,573 (10 percent) of which were unmarked wild fish and 59,362 (90 percent) marked hatchery fish.

Wild Trout

Of the 6,573 wild trout caught, 5,716 (87 percent) were brown trout, 791 (12 percent) rainbow trout, and 66 (1 percent) eastern brook trout. It is remarkable that the wild brown trout population was able to sustain itself in the face of the unusually heavy fishing pressure and continued competition with huge numbers of alien trout for food and living space. The wild populations of rainbow and eastern brook trout were not, judging by yearly catches, able to sustain themselves under such conditions.

Catchable Rainbow Trout

Of the total of 69,904 catchable rainbow planted, 57,863 were caught during the season of planting and 152 in following seasons (including 34 caught in 1952), for an over-all return to the creel of 58,015 or 83 percent (Table 6). The catches during the season in which the fish were planted averaged 82.8 percent, with a range of 70.5 percent in 1951 to 92.1 percent in 1948. Catchables caught in later fishing seasons added an inconsequential 0.2 percent to the total yield.

The excellent yields obtained at Rush Creek demonstrate conclusively the value of in-season, spaced plantings of catchable trout for maintaining reasonably good angling in a small, heavily fished stream. It is doubtful that satisfactory fishing can be maintained in such waters for any great number of anglers by any other method.

	1947	1948	1949	1950	1951	1947-1951 Combined	Yearly average
Length of season (days)	184	172	184	184	187	911	182
Number days fished	180	169	179	176	171	875	175
Number angler days	5,778	8,384	10,004	5,805	3,460	33,431	6,686
Total hours fished	19,569	31,962	36,417	19,070	11,390	118,408	23,682
Average angler day (hours)	3.4	3.8	3.6	3.3	3.3		3.5
Catchable trout planted	10,000	19,945	19,975	10,000	9,984	69,904	13,981
Catchable trout caught in season of planting	8,881	18,362	15,995	7,584	7,041	57,863	11,573
Percentage return to creel[1]	88.8	92.1	80.1	75.8	70.5	82.8	82.8
Catchable trout caught in seasons following planting[2]		11	17	13	77		
Subcatchable trout planted	4,000	8,000				12,000	
Subcatchable trout caught	128	694	171	1	0	994	
Percentage return to creel						8.3	
Fingerling trout planted		7,392	6,003			13,395	
Fingerling trout caught		20	180	148	38	386	
Percentage return to creel						2.9	
Total catch planted trout	9,009	19,087	16,363	7,746	7,157	59,362	11,872
Total catch wild trout	1,351	1,292	1,657	1,032	1,241	6,573	1,315
Brown trout[3]	1,104 (81.7%)	1,131 (87.5%)	1,373 (82.9%)	938 (90.9%)	1,170 (94.3%)	5,716	1,143 (87.0%)
Rainbow trout[3]	214 (15.8%)	140 (10.8%)	279 (16.8%)	92 (8.9%)	66 (5.3%)	791	158 (12.0%)
Eastern brook trout[3]	33 (2.4%)	21 (1.6%)	5 (0.3%)	2 (0.2%)	5 (0.4%)	66	13 (1.0%)
Total catch all trout	10,360	20,379	18,020	8,778	8,398	65,935	13,187
Percentage planted trout	87.0	93.7	90.8	88.2	85.2		90.0
Percentage wild trout	13.0	6.3	9.2	11.8	14.8		10.0
Average catch per angler day	1.8	2.4	1.8	1.5	2.4		2.0
Average catch per angler hour	0.53	0.64	0.49	0.46	0.74		0.56
Number zero catches	2,855	3,287	4,150	2,497	1,682	14,471	2,894
Percentage zero catches	49.2	39.2	41.5	43.0	48.6		43.3

[1] In-season yield only; for total yield, see Table 6.
[2] 1952 catch includes 33 trout from 1951 plants and one from 1950 plants.
[3] With percentage of total wild trout catch.

TABLE 6

Returns of Catchable Rainbow to the Creel at Rush Creek From Plantings Made From 1947 to 1951

Year	Mark	Number planted	Yield to the creel						Total yield	Percent yield first season	Percent yield next season	Percent total yield to creel
			1947	1948	1949	1950	1951	1952				
1947	LV	10,000	8,881	11	1	0	0	0	8,893	88.8	0.11	88.9
1948	RV	19,945		18,362	16	0	0	0	18,378	92.1	0.08	92.2
1949	Both V	19,975			15,995	13	2	0	16,010	80.1	0.06	80.2
1950	RV	10,000				7,584	75	1	7,660	75.8	0.75	76.6
1951	Both V	9,984					7,041	33	7,074	70.5	0.33	70.8
Totals and averages		69,904	8,881	18,373	16,012	7,597	7,118	34	58,015	82.8	0.21	83.0

V = ventral fin; L = left; R = right.

Fingerling Rainbow and Brown Trout and Subcatchable Rainbow [1]

The yield to the creel from summer-planted fingerling rainbow and brown trout and from fall-planted subcatchable rainbow during the census period is summarized in Table 7.

Only 386 (2.9 percent) of a total of 13,395 fingerlings planted were caught. Rainbow gave a slightly greater return (3.2 percent) than brown trout (2.6 percent) planted at the same time.

The somewhat larger subcatchables gave an appreciably greater return than the fingerlings; 994 (8.3 percent) of 12,000 subcatchables planted during the census period were caught. Although Table 7 apparently indicates superiority of the spring-spawned strain, with a 12.5 percent return, over the fall-spawned strain, with a 4.1 percent return, the data are inconclusive. In fact, nearly the entire difference between the yields of the two stocks arose from the fall, 1948 plants. Four thousand rainbows of each strain were planted on the same day, October 13th, and yet during the remaining 18 days of the fishing season 444 of the spring-spawned group and only three of the fall-spawned group were removed. The two plants were apparently made, contrary

TABLE 7

Returns of Fingerling Rainbow and Brown Trout and Subcatchable Rainbow Stocked in Rush Creek, 1947-1951

Mark	Time of plant	Number planted	Seasonal yield						Total yield	Yield in percent of total plant
			1947	1948	1949	1950	1951	1952		
Fingerlings										
Rainbow trout										
D	Summer, 1948	4,000		18	105	8	0	0	131	3.3
LV	Summer, 1949	3,000			0	87	3	0	90	3.0
Total		7,000							221	3.2
Brown trout										
LV	Summer, 1948	3,392		2	75	19	0	0	96	2.8
RV	Summer, 1949	3,003			0	34	35	0	69	2.3
Total		6,395							165	2.6
Total, all fingerlings		13,395		20	180	148	38	0	386	2.9
Subcatchables										
Rainbow trout (spring-spawned)										
Ad-LV	Fall, 1947	2,000	14	178	3	0	0	0	192	9.6
Ad-D	Fall, 1948	4,000		444	114	1	0	0	559	14.0
Total		6,000							751	12.5
Rainbow trout (fall-spawned)										
Ad-RV	Fall, 1947	2,000	114	72	0	0	0	0	186	9.3
Ad	Fall, 1948	4,000		3	54	0	0	0	57	1.4
Total		6,000							243	4.1
Total, all subcatchables		12,000	128	694	171	1	0	0	994	8.3

Ad = adipose fin; V = ventral fin; D = dorsal fin; L = left; R = right.
[1] For size of fish and dates of planting see Table 4.

to instructions, in different parts of the stream, and as a result were subjected to greatly different fishing intensities.

The low over-all return from the fingerling and subcatchable plants illustrates the impracticability of maintaining satisfactory angling by fall planting of trout in small, heavily fished streams.

Angling Intensity and Angling Success

During the five seasons of this census period each mile of the test stream supported an average of 10 anglers and 35 angling hours per day. Average catch per angler was 0.56 trout per hour and 2.0 trout per day. Forty-three percent of all anglers caught nothing, despite the heavy plants of catchable trout. Thus, most anglers still had only poor to fair fishing, with the bulk of the fish caught by a minority. This emphasizes the desirability of a reduced bag limit on waters under this type of management in order to distribute the fish more equitably

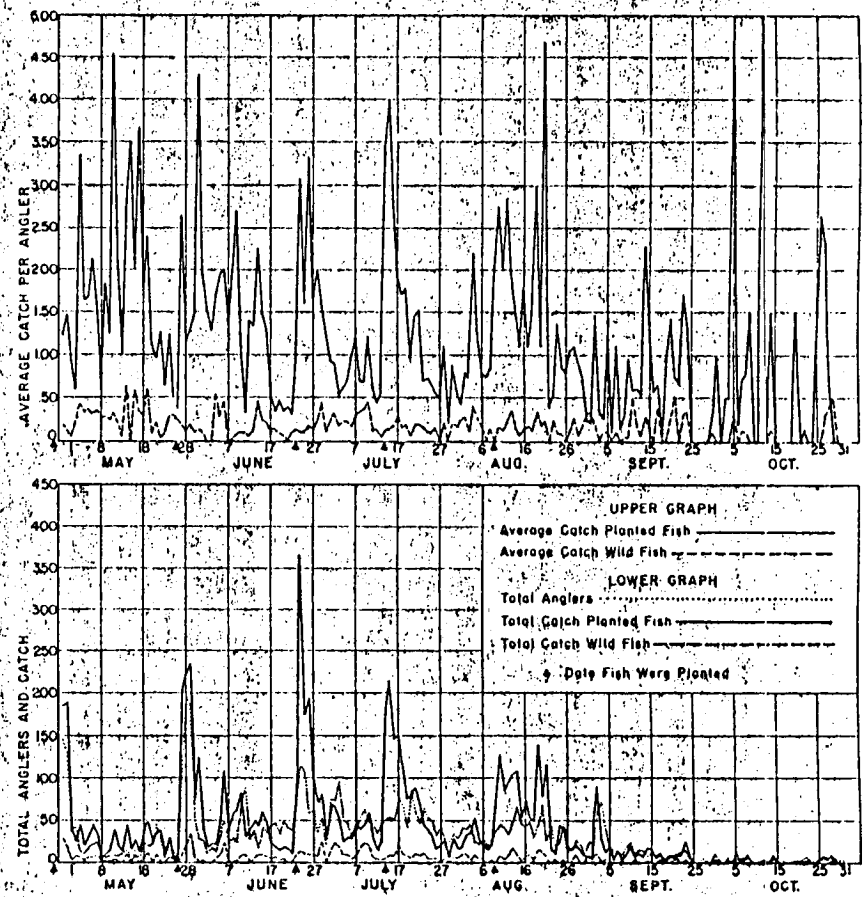

FIGURE 5. Graph of anglers' daily catches from Rush Creek Test Stream, Mono County, California, season of 1950.

and to give the less expert anglers a better opportunity to catch some of them.

Angling success (as measured by catch per day and catch per hour) varied somewhat from year to year (Table 5), apparently with little correlation with the size of the plant, the number of anglers, or the decreasing stream flow. It is probable, however, that angling success would have been greater in 1948 and 1949 if the increased plants in those years had not attracted correspondingly more anglers.

The catchables were normally recaptured very rapidly. This is shown strikingly by the graphs in Figure 5. In 1950, a typical year, 45 percent of the seasonal catch was taken during the five five-day periods immediately following stocking, which amounted to only one-seventh of the total fishing season. The plants gave the fishery a "shot in the arm," with a high yield for the first few days, followed by a diminishing catch until the next plant. Each plant also briefly increased the take of wild fish, and was followed shortly by a decrease in the catch of such fish as well.

In 1948 a special three-day post-planting closure was tested as a possible means of spreading the catch. It actually had the opposite effect, however, since reopening of the stream resulted in extraordinarily heavy fishing pressure. The percentage of return that season was the greatest recorded during the census.

The great increase in fishing intensity and success following stocking which occurred so consistently at the test stream suggests the desirability, particularly during the summer vacation season, of more frequent plants well-scattered along the stream. The stocking pattern for California streams is being shifted rapidly in this direction.

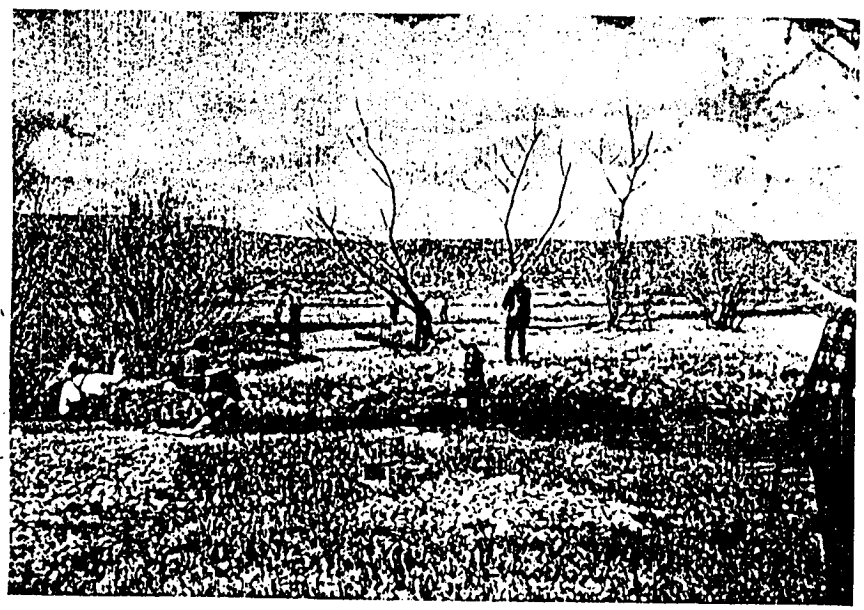

FIGURE 6. Anglers fishing the meadow section of Rush Creek Test Stream. *Photograph by Elden H. Vestal, May 2, 1948.*

RECREATIONAL VALUES

During the five-year period covered by this report, 33,431 days of angling were spent on Rush Creek. This recreation was primarily developed by stocking 70,000 catchable trout, at an estimated total cost of $10,500 (15 cents per fish). Without such stocking, fishing would have deteriorated early in the season each year.

The value of a day of trout angling is believed to be in the neighborhood of $10, on the basis of the costs to the fisherman, although accurate estimates for the Inyo-Mono area are not available. On that basis, recreational values exceeding $300,000 were sustained at Rush Creek over a five-year period with only $10,500 worth of fish.

ACKNOWLEDGMENTS

The Rush Creek project was fortunate in having the continued support of a number of persons and agencies. Mr. J. B. Clover, acting for the Finley Estate, has continually aided the project by making portions of the test site available from year to year. The writer is pleased to credit especially Mrs. Venita R. McPherson, former Supervisor of District 3, Mono County, and the Inyo and Mono County Boards of Supervisors for financial support in bridging Rush Creek and in access road maintenance from US Highway 395. The Inyo National Forest, the Nevada-California Electric Corporation, the Mono County Western Conservation Club, and interested residents of Lee Vining and June Lake aided in bridge construction and fish planting. The City of Los Angeles Department of Water and Power kindly provided stream flow records and granted access to city-owned portions of the stream.

Mr. Walter L. Dombrowski was employed as principal recorder at Rush Creek checking station from 1947 until the close of the 1949 season. Mr. Valjean Clark was recorder for the 1950 angling season and Mr. George Murphy was principal recorder in 1951. A succession of student biologists, including Messrs. John F. Williams, James R. King, Robert R. Ehlers, and Edwin Pister, aided these men.

The project benefited greatly from the guidance of Messrs. Alan C. Taft and Brian Curtis.

Mr. Ralph V. Beck assisted in operation of the checking station and marking of trout through the season of 1950. In 1951 Mr. Beck, under the supervision of Mr. Scott M. Soule, assumed direction of the project. The writer is grateful for the opportunity to incorporate the results of his work during the 1951 season in Table 5 of this paper.

SUMMARY

1. This paper reports results of the first five years (1947 through 1951) of a continuing complete creel census on Rush Creek Test Stream, a 3.7 mile section of a small California trout stream.
2. Rush Creek Test Stream was established by the California Department of Fish and Game to test the success of existing planting procedures and to find ways of improving them. Large in-season plants of marked catchable rainbow trout were made each year. Smaller plants of marked subcatchable rainbow trout and marked

fingerling rainbow and brown trout were made in the first three years to determine over-winter survival of such fish.

3. During the five-year census period, 33,431 anglers fished 118,408 hours and caught a total of 65,935 wild and planted trout. Planted trout contributed 59,362 (90 percent) of the total catch, while wild trout contributed 6,573 (10 percent).
4. The catch of wild brown trout remained about the same each year, despite the heavy fishing pressure, while the catch of wild rainbow and eastern brook trout declined.
5. Of 69,904 marked catchable rainbow planted, 58,015 (83 percent) were caught by anglers; 82.8 percent in the season of planting and 0.2 percent in succeeding seasons. This excellent yield demonstrates the value of in-season, spaced plantings of such fish for maintaining reasonably good angling in a small, heavily fished stream.
6. Of 13,395 fingerlings planted, only 386 (2.9 percent) were caught. Rainbow gave a slightly greater return (3.2 percent) than brown trout (2.6 percent). Of 12,000 subcatchables planted, 994 (8.3 percent) were caught. The spring-spawned strain gave a better return (12.5 percent) than the fall-spawned strain (4.1 percent), but data were insufficient to prove any superiority. These low returns illustrate the impracticability of maintaining angling in a small, heavily fished stream by stocking fry or subcatchables.
7. The five-year average intensity of use was 10 anglers and 35 angling hours per mile of stream per day.
8. Average catch per angler day was 2.0 and the average catch per angler hour was 0.56. The average angler day was 3.5 hours.
9. Forty-three percent of all anglers caught nothing, despite the heavy planting program. A reduced bag limit would probably distribute the fish more equitably and give the less expert anglers a better chance.
10. Catchables were recaptured rapidly. In 1950, a typical year, 45 percent of the total seasonal catch was taken in only one-seventh of the total fishing season. This suggests the desirability of more frequent plants well-scattered along the stream.
11. The estimated total cost of stocking 70,000 catchable rainbow trout during the five years of the census period was $10,500. Placing a value of $10 on a day of trout angling in the Mono-Inyo area of California (based on probable costs to the fisherman), a total recreational value exceeding $300,000 was sustained at Rush Creek mainly by this stocking.

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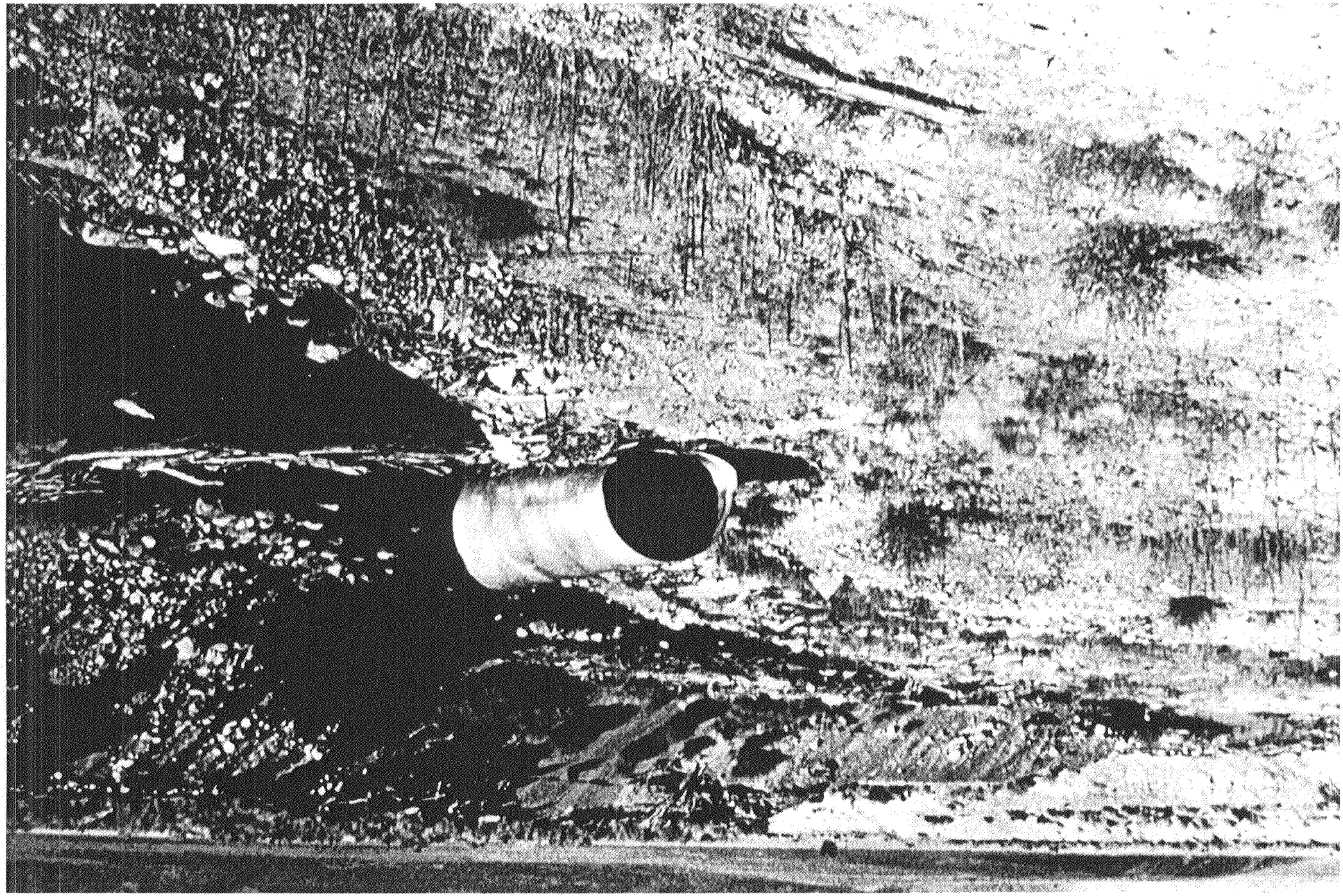

Photo of Rush Creek in area moving out of meadows and into the delta, taken by Vestal in 1986. This photo was taken in the same area as the photo showing the downstream weir and fishtrap taken by Vestal on 04/10/47, from the opposite side of the stream. These two photos serve to demonstrate the contrast between the thriving condition of the stream in 1947 and its devastated condition in 1986.