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ANNUAL REPORT
WARM SPRINGS SALMON AND STEELHEAD HATCHERY, 1985-86

by

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Region 3, Inland Fisheries

Inland Fisheries
Administrative Report No. 88-4

1988

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ABSTRACT

This report describes the operation of Warm Springs Salmon and Steelhead Hatchery from July 1, 1985 through June 30, 1986. Tables and Appendices present daily records of water temperatures, daily numbers of salmon and steelhead entering the Hatchery, and total number of salmonids reared and released.

Sixty-five chinook salmon, *Oncorhynchus tshawytscha*, and 1,300 steelhead trout, *Salmo gairdneri*, were trapped at the Hatchery this season; no coho salmon, *O. kisutch*, were trapped. There were 884,520 advanced fingerling chinook salmon and 42,525 fingerling and 86,425 yearling coho salmon planted. Also planted were 500,257 fingerling, 38,900 advanced fingerling, and 212,365 yearling steelhead.

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INTRODUCTION

This is the sixth annual report for operation of the Warm Springs Salmon Steelhead Hatchery. It describes operation of the Hatchery from July 1, 1985 through June 30, 1986. Copies of previous annual reports are available upon request from the Inland Fisheries Division, Rancho Cordova.

Warm Springs Hatchery is located on Dry Creek, 14 miles upstream from its confluence with the Russian River, 2 miles south of Healdsburg, Sonoma County. The Hatchery was constructed by the Department of the Army, Corps of Engineers, to compensate for spawning and nursery areas blocked by the Warm Springs Dam - Lake Sonoma Project. The Department of Fish and Game, under agreement with the Department of the Army, operates the fish hatchery and related facilities.

This report summarizes the number of fish trapped and spawned, production of eggs and fish, and water temperatures from July 1, 1985 through June 30, 1986.

PRODUCTION SUMMARY

The ladder was opened October 15, 1985. The flows in Dry Creek were 40 cfs until October 19, 1985, when they were increased to 200 cfs for 3 days and then reduced to 40 cfs until November 4, 1985, when they were again increased to 200 cfs for 3 days, then reduced to 40 cfs, where they remained until February 24, 1986, when Lake Sonoma was approaching conservation pool. During late February and March, flows ranged from 700 to 2,500 cfs, then were reduced to 75 cfs, where they remained through June 30, 1986. Sixty-five chinook salmon and 1,300 steelhead were trapped and 298,790 yearlings and 1,466,202 fingerlings were planted during the 1985-86 season (Table 1 and Appendix Table 1). No coho salmon were trapped.

TABLE 1. Warm Springs Hatchery Production Summary, 1986-87

| Species | Adults trapped | Females spawned | Eggs taken | Fingerlings received | Fingerlings transferred or planted | Yearlings planted | Total pounds released |
|----------------|----------------|-----------------|------------|----------------------|------------------------------------|-------------------|-----------------------|
| Chinook salmon | | | | | | | |
| 1985 BY | 65 | | | 927,810 | 884,520 | | 18,595 |
| Coho salmon | | | | | | | |
| 1984 BY | | | | | | 86,425 | 7,325 |
| 1985 BY | | | | 170,625 | 42,525 | | 525 |
| Steelhead | | | | | | | |
| 1985 BY | | | | | 273,240 | 212,365 | 31,089 |
| 1986 BY | 1,300 | 423 | 2,143,212 | | 265,917 | | 519 |
| Totals | 1,365 | 423 | 2,143,212 | 1,098,435 | 1,466,202 | 298,790 | 58,053 |

All fish were started on Bio-Diet and then fed Oregon Moist Pellets. A total of 58,053 lb. of fish was produced using 95,994 lb. of feed giving a conversion rate (pounds of feed to produce 1 lb. of fish) of 1.6.

WATER QUALITY

This is the first year of propagation and rearing since Lake Sonoma filled. Immediately after the heavy rainfall during February 1985, the turbidity of the Hatchery's incoming water was 310 N.T.U.s (nephelometric turbidity units). By the end of June, the turbidity had decreased to 42 N.T.U.s. The turbidity remained longer than anticipated because of its colloidal nature.

The turbidity had an adverse effect on all phases of production; i.e., 1) decreased egg fertility (the season's average on steelhead was 71%, with a low of 45%, 2) increased mortality through hatching, swim up, and early fry stages for a total survival of 54% from egg take to ponding size at 6 weeks, and 3) higher than normal outbreaks of columnaris and furunculosis.

DISEASE

Minor outbreaks of columnaris occurred when water temperatures reached the high 50's F., they were controlled with the use of a salt flush, Hyamine drip, and feeding Terramycin.

The Hatchery experienced furunculosis for the first time, which was controlled by mixing Furox 100 and Sulfamethazine into the feed.

CHINOOK SALMON PROGRAM

History of the 1985-86 Season

There were 65 adult male chinook salmon trapped at the Hatchery. No fish were spawned this season. A total of 927,810 Wisconsin- strain fingerlings was received from Silverado Fisheries Base. These fingerlings produced 912,287 fish, of which 884,520 were released in Dry Creek and the Russian River (Table 2), and 27,767 were retained at the Hatchery for release as yearlings during the 1986-87 production year.

COHO SALMON PROGRAM

History of the 1985-86 Season

No coho salmon were trapped at the Hatchery this season. Approximately 90,000 Noyo and Dry Creek-strain advanced fingerlings were held from the 1984-85 season, and 170,625 Klamath River fingerlings were received from Mad River Hatchery.

A total of 42,525 fingerlings and 86,425 yearlings was planted from the Hatchery. Two groups of 40,000 each were coded wire tagged and are being held for later release (Table 3).

TABLE 2. Fingerling Chinook Salmon Plants, 1985-86

| Date | Strain | Release site | Average size/lb | Number |
|---------|-----------|---------------------------|-----------------|---------|
| 4-21-86 | Wisconsin | Dry Creek (Yoakim Bridge) | 57 | 188,000 |
| 4-29-86 | Wisconsin | Dry Creek (Yoakim Bridge) | 60 | 48,000 |
| 5-06-86 | Wisconsin | Dry Creek (Hatchery) | 46 | 213,670 |
| 5-15-86 | Wisconsin | Russian River (Monte Rio) | 52 | 41,600 |
| 5-15-86 | Wisconsin | Dry Creek (Yoakim Bridge) | 52 | 41,600 |
| 5-15-86 | Wisconsin | Russian River (Monte Rio) | 44 | 35,200 |
| 5-16-86 | Wisconsin | Russian River (Monte Rio) | 46 | 73,600 |
| 5-16-86 | Wisconsin | Dry Creek (Yoakim Bridge) | 46 | 36,800 |
| 5-19-86 | Wisconsin | Russian River (Monte Rio) | 45 | 72,000 |
| 5-20-86 | Wisconsin | Russian River (Monte Rio) | 45 | 36,000 |
| 6-09-86 | Wisconsin | Dry Creek (Yoakim Bridge) | 37 | 98,050 |
| Total | | | | 884,520 |

TABLE 3. Coho Salmon Plants, 1985-86

| Date | Strain | Release site | Average size/lb | Number | Mark |
|-------------------|--------------------|--------------|-----------------|--------|--------------------------------|
| 1-06-86 | Noyo and Dry Creek | Dry Creek | 12.8 | 41,600 | AD-CWT 06-51-03 06-51-04 |
| 2-28-86 | Noyo and Dry Creek | Dry Creek | 11.0 | 4,593 | -- |
| 2-28-86 | Noyo and Dry Creek | Dry Creek | 11.0 | 23,457 | AD-CWT 06-51-05 06-51-06 |
| 3-03-86 | Noyo and Dry Creek | Dry Creek | 11.0 | 16,775 | AD-CWT 06-51-06 |
| TOTAL YEARLINGS | | | | 86,425 | |
| 6-05-86 | Klamath | Dry Creek | 81.0 | 42,525 | AD-CWT 06-51-07 06-51-08 |
| TOTAL FINGERLINGS | | | | 42,525 | |

STEELHEAD TROUT PROGRAM

History of the 1985-86 Season

The first steelhead entered the trap on December 3, 1985 and the last on April 8, 1986. A total of 1,300 fish was trapped: 812 males, 484 females, and 4 half pounders. The 423 females spawned produced 2,143,212 eggs, an average of 5,066 eggs per female. All surplus adult fish were trucked to the Russian River and released above the mouth of Dry Creek.

Surplus eggs were taken because of the low egg fertility and high fry mortality associated with the turbidity and to spread the spawning period as long as possible. The surplus fingerlings were planted in local waters and transferred to Talmage Rearing Ponds (Table 4).

A total of 212,365 steelhead yearlings was released into Dry Creek (Table 5).

TABLE 4. Fingerling Steelhead Trout Plants, 1985-86

| Date | Strain | Release site | Average size/lb | Number |
|----------|-----------|---------------------------------------|-----------------|---------|
| 07-10-85 | Dry Creek | Sonoma Creek | 288 | 20,160 |
| 07-11-85 | Dry Creek | Dry Creek | 262 | 31,440 |
| 07-11-85 | Dry Creek | Lake Sonoma | 328 | 34,440 |
| 09-24-85 | Dry Creek | Talmage Rearing Ponds (Trap) | 63 | 53,550 |
| 09-25-85 | Dry Creek | Talmage Rearing Ponds | 63 | 24,250 |
| 10-23-85 | Dry Creek | Russian River (Jenner) | 60 | 70,500 |
| 10-29-85 | Dry Creek | Lake Sonoma | 44 | 38,900 |
| 05-28-86 | Dry Creek | Mill Creek (Sonoma County) | 270 | 13,500 |
| 05-28-86 | Dry Creek | Porter Creek | 270 | 13,500 |
| 05-29-86 | Dry Creek | Russian River, Upper (Redwood Valley) | 270 | 13,500 |
| 05-29-86 | Dry Creek | Cummiskey Creek | 460 | 13,800 |
| 05-30-86 | Dry Creek | Pena Creek | 460 | 9,200 |
| 06-02-86 | Dry Creek | East Austin Creek | 450 | 13,500 |
| 06-02-86 | Dry Creek | Grey Creek | 450 | 9,000 |
| 06-02-86 | Dry Creek | Forsythe Creek | 588 | 8,232 |
| 06-02-86 | Dry Creek | Mill Creek (Mendocino County) | 588 | 11,760 |
| 06-03-86 | Dry Creek | Russian River (Coyote Dam) | 560 | 28,000 |
| 06-04-86 | Dry Creek | Maacama Creek | 736 | 36,800 |
| 06-04-86 | Dry Creek | Dry Creek (Hatchery) | 915 | 22,875 |
| 06-05-86 | Dry Creek | Feliz Creek | 900 | 22,500 |
| 06-06-86 | Dry Creek | Gibson Creek | 950 | 17,100 |
| 06-06-86 | Dry Creek | Orr Creek | 950 | 16,150 |
| 06-25-86 | Dry Creek | Fall Creek | 330 | 16,500 |
| Total | | | | 539,157 |

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TABLE 5. Yearling Steelhead Trout Plants, 1985-86

| Date | Strain | Release Site | Average size/lb | Number |
|---------|-----------|---------------------------|-----------------|---------|
| 2-23-86 | Dry Creek | Dry Creek (Yoakim Bridge) | 4.9 | 21,560 |
| 2-24-86 | Dry Creek | Dry Creek (Yoakim Bridge) | 4.9 | 4,655 |
| 2-28-86 | Dry Creek | Dry Creek (Yoakim Bridge) | 8.1 | 41,310 |
| 3-03-86 | Dry Creek | Dry Creek (Yoakim Bridge) | 9.6 | 42,720 |
| 3-03-86 | Dry Creek | Dry Creek (Yoakim Bridge) | 7.6 | 19,380 |
| 4-02-86 | Dry Creek | Dry Creek (Yoakim Bridge) | 6.8 | 35,700 |
| 4-14-86 | Dry Creek | Dry Creek (Yoakim Bridge) | 9.8 | 47,040 |
| Total | | | | 212,365 |

PUBLIC RELATIONS

All visitors to the Hatchery must enter through the Visitor Center, where they are counted. During the 1985-86 season, 225,172 people visited the Hatchery (Table 6). This is a 12% increase over the previous report period.

TABLE 6. Warm Springs Hatchery Monthly Visitation Data, 1985-86

| Month | Number of visitors |
|-----------|--------------------|
| July | 26,929 |
| August | 22,939 |
| September | 15,208 |
| October | 12,586 |
| November | 11,778 |
| December | 12,212 |
| January | 17,028 |
| February | 22,061 |
| March | 22,348 |
| April | 15,092 |
| May | 23,625 |
| June | 23,366 |
| Total | 225,172 |

APPENDIX TABLE 1. Weekly Adult Salmon and Steelhead Trapping Data for Warm Springs Salmon and Steelhead Hatchery, 1985-86.

| <u>Week</u> | <u>Chinook salmon</u> | | <u>Coho salmon</u> | | <u>Steelhead trout</u> | |
|----------------------|-----------------------|---------------|--------------------|---------------|------------------------|----------------|
| | <u>Adults</u> | <u>Grilse</u> | <u>Adults</u> | <u>Grilse</u> | <u>Males</u> | <u>Females</u> |
| 10/13/85 - 10/19/85 | 5 | | | | | |
| 10/20/85 - 10/26/85 | 52 | | | | | |
| 10/27/85 - 11/02/85 | 7 | | | | | |
| 12/01/85 - 12/07/85 | | | | | 7 | 2 |
| 12/08/85 - 12/14/85 | | | | | 2 | 1 |
| 12/15/85 - 12/21/85 | | | | | 1 | |
| 12/29/85 - 01/04/86 | | | | | 1 | |
| 01/05/86 - 01/11/86 | | | | | 8 | 8 |
| 01/12/86 - 01/18/86 | | | | | 48 | 22 |
| 01/19/86 - 01/25/86 | | | | | 35 | 22 |
| 01/26/86 - 02/01/86 | | | | | 101 | 61 |
| 02/02/86 - 02/08/86 | | | | | 92 | 65 |
| 02/09/86 - 02/15/86 | | | | | 70 | 44 |
| 02/16/86 - 02/22/86 | | | | | 81 | 47 |
| 02/23/86 - 03/01/86 | | | | | 47 | 56 |
| 03/02/86 - 03/08/86 | | | | | 117 | 53 |
| 03/09/86 - 03/15/86 | 1 | | | | 69 | 37 |
| 03/16/86 - 03/22/86 | | | | | 39 | 27 |
| 03/23/86 - 03/29/86 | | | | | 71 | 28 |
| 03/30/86 - 04/05/86 | | | | | 26 | 9 |
| 04/06/86 - 04/12/86 | | | | | 1 | 2 |
| Season Totals | 65 | | | | 816 | 484 |