

1981 adopted

FISH MANAGEMENT PLAN

ANA RESERVOIR

Oregon Department of Fish and Wildlife

Fish Division

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INTRODUCTION

Ana Reservoir is a 62-acre impoundment located approximately 5 miles north of Summer Lake and 2 miles northeast of the community of Summer Lake in Lake County (Fig. 1). It is owned by the Summer Lake Irrigation District and was created in 1922 by construction of an earthen dam just downstream from a group of springs that formed Ana River. The resulting impoundment flooded the springs so water could be diverted into an irrigation canal for gravity distribution. The outlet from Ana Reservoir is now the head of Ana River. The reservoir is unique in that it is not dependent on the storage of run-off water, since the springs maintain a nearly constant flow of approximately 90 cfs.

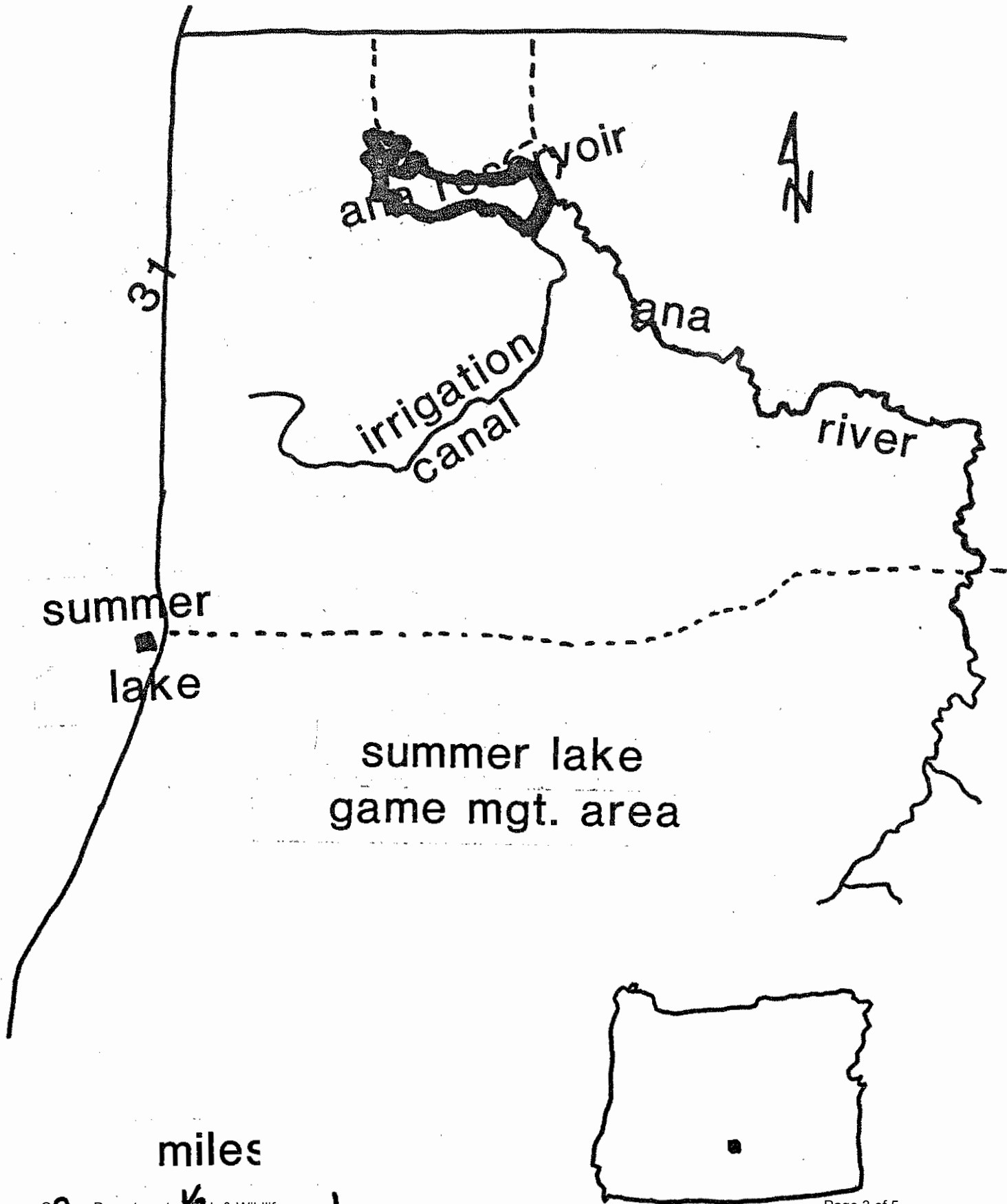
We have tried various trout management programs at Ana Reservoir, but maintenance of an acceptable fishery has required periodic chemical treatment to reduce competition from tui chubs. In July 1981, the Oregon Fish and Wildlife Commission accepted the Department's recommendation to introduce a new fish species (striped X white bass hybrid) into the reservoir. This is a good game fish, which will utilize chubs as forage.

HABITAT

Reservoir productivity, as measured by conductivity, has not been determined but is undoubtedly high, as is characteristic of the highly alkaline waters of the Great Basin. The pH of the reservoir is 9.3. Productivity is further enhanced by the constant 90 cfs inflow of 58 F spring water which maintains temperatures suitable for year-round fish growth. Even during the winter months, the surface temperature of the reservoir remains above 50 F.

One factor limiting fish production is the fairly limited amount of shallows. The steep-sided shape of the draw in which the reservoir is situated results in a generally narrow littoral zone except at the southwest corner and in two areas at either end of the dam. However, the clarity of the water allows aquatic vegetation to occupy most areas less than 10 feet deep. A second limiting factor is the annual winter drawdown of the reservoir. The Summer Lake Irrigation District normally draws the water level down about 5 feet during the nonirrigation season of November through April to (1) prevent water from entering the canal, (2) reduce shoreline erosion by wave action, and (3) increase the flow in Ana River by reducing the water pressure on the springs. The drawdown reduces the surface area of the reservoir from 62 to 50 acres and reduces the volume from 1,170 acre-feet to about 1,000 acre-feet.

area map
ANA RES.



FISH POPULATIONS

The portion of Ana River inundated by the reservoir originally contained native trout, probably redband, and tui chub. Longtime area residents reported catching large, dark colored trout in excess of 2 feet long from the river prior to and for a few years after construction of the dam. The river immediately below the springs was undoubtedly a major spawning area for the native trout, as there is little spawning habitat further downstream. The inundation of this area was probably the major factor contributing to the eventual disappearance of the native trout.

Ana Reservoir presently contains rainbow trout and tui chubs. Department records show that rainbow were stocked in the reservoir as early as 1948; however, it is probable that trout were released prior to this time. Since 1948, the reservoir has received annual plants of rainbow. During the period 1964 to 1968, chinook and coho salmon fingerlings were also stocked in the reservoir in an effort to find a more effective predator on chubs. Overall survival was poor, although a few coho survived to reach a maximum size of 26 inches and 6 lb.

Since 1971, the Eagle Lake (California) strain of rainbow trout has been stocked. These fish have the reputation of being voracious predators on tui chub in Eagle Lake, California. However, fingerlings stocked in Ana Reservoir from 1971 to 1977 showed poor survival, growth, and condition. In 1978, the program was changed to fall releases of half-pound size trout in an effort to introduce a fish large enough to immediately begin preying on chubs. This change was based on findings that most Ana Reservoir trout over 10 inches long feed on chubs.

All Eagle Lake rainbow stocked in 1978, 1979, and 1980 were marked for identification. Population and creel sampling indicates these fish have better initial survival than fingerlings, utilize chubs for forage, and achieve fair to good body condition and growth. However, they suffer high angling mortality the spring after they are stocked and few survive to utilize and control the chub population. Attempts to reduce angling mortality have included the imposition of a winter angling closure, reducing the daily bag limit to 5 trout, stocking of catchable trout to replace Eagle Lake trout in the bag, and an education campaign asking anglers to voluntarily release all marked fish. None of these efforts have improved the long-term survival of Eagle Lake trout. Consequently, fall population samples show the same low trout population and high percentage of chubs as occurred under the fingerling management program.

To date, success of the rainbow stocking program has depended on periodic chemical rehabilitation. The reservoir has been chemically treated three times. No population data are available for years prior to 1955. However, population samples in 1955 and 1956 were comprised of 99 and 96% chubs, respectively, prompting chemical treatment in 1957 with rotenone and toxaphene. Following this treatment, trout did well for 2 years showing a year-round growth rate in 1958 of 1.1 inch/month. However, by the fall of 1958, chubs comprised 23% of the population sample. By 1960, this had risen to 92% and trout growth had dropped to 0.3 inch/month. The reservoir was treated again in 1961 using both liquid rotenone and toxaphene. As in 1957, divers were used to locate and treat spring areas, but this time extra effort was taken to locate all springs. Despite this effort the kill was not complete; and by 1964, chubs again comprised 71% of the sample. Fintrol (antimycin) was used to treat the

reservoir in 1970, and again the springs as well as into the main body of the reservoir were treated. This treatment was not as effective as the previous ones, as evidenced by 58% chubs in the 1971 population sample. By 1975, chubs comprised 94% of the annual sample and they have remained at about this level.

FISHERY

The shoreline of Ana Reservoir is owned by the Summer Lake Irrigation District and is open to public access. All-weather roads provide access to both ends of the reservoir and dry-weather roads circle the reservoir. The reservoir remains ice-free year-round due to the large inflow of warm spring water. Angler use is heavy only at the beginning of the season due to the long distance away from any population center. Use is light the rest of the year. Total annual angler use is estimated at 3,500 recreation days.

Ana Reservoir reportedly provided excellent angling for large trout in years past. However, in the last 20 years the average catch rate has ranged from 0.2 fish/hour in years of high chub abundance to 2.4 fish/hour after chemical treatment and reestablishment of trout. Catch rates were highest when small trout composed the bulk of the catch. In recent years the catch rate has been increased to + 1.0 fish/hour by supplemental stocking with catchable rainbow trout and by the "put-and-take" type fishery generated by the stocking of catchable-size Eagle Lake rainbow trout.

OBJECTIVES

The fishery management objectives at Ana Reservoir are: (1) provide a fishery in the reservoir with a catch rate of 0.5 to 1.0 fish/angler-hour, (2) reduce or eliminate the need for periodic chemical rehabilitation to control tui chubs, and (3) utilize the natural fish production capability of the reservoir.

DISCUSSION

Past management failures at the reservoir have demonstrated the difficulty of maintaining an acceptable fishery in habitat occupied by tui chubs. The history of chemical treatment at the reservoir indicates that chubs cannot be totally eliminated. Benefits from chemical control efforts have been short term. Introducing a predator (striped white bass hybrid) to utilize the chubs as forage appears to offer the best prospects for improving fishing at Ana Reservoir.