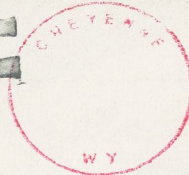


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History So R. cutt  
broad stock



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3/2/91  
Bob: Here's history of  
SNAKE RIVER CUTT BROOD  
AT AUBURN HATCHERY.  
DATE @ 1950-1951. Author  
UNKNOWN, MAYBE EARL WILDE.

Bob

Brood Stock  
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Sportsmen and fisheries management personnel view this condition with mixed emotions. Fisheries management people believe that everything possible should be done in order to save and stimulate this species which they believe has certain qualities which make it superior to the exotics which threaten to replace it. Some fishermen maintain that the loss of the native if it were to be replaced by other trout species would not be a serious one.

One of the reasons why rainbows have been planted in the past where it might have been best to have planted cutthroats is that rainbows have been available for planting and cutthroats were not. Rainbow eggs are usually easier to obtain and trout culturists are generally of the opinion that rainbows are much easier to raise. That opinion has been shared by the writer, but recent experience has shown that artificial propagation of this particular stream cutthroat was not as difficult nor as costly as he had previously supposed.

## The Development of a Cutthroat (*Salmo clarki lewisi*) Brood Stock

Personnel: Fish Cultural personnel of the Wyoming State Fish Hatchery, Auburn, Wyoming.

Native stream cutthroat trout (*salmo clarki lewisi*) populations in streams of the Rocky Mountain region have decreased markedly. Native trout populations have suffered as a result of modern agricultural practices, dam construction and the indiscriminate plantings of exotic species. In many streams the native cutthroat has disappeared completely while in others its numbers have been reduced to the point where this species makes up only a small percentage of the fisherman's catch.

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Despite the factors previously mentioned which have led to a decrease in cutthroat trout numbers, the Snake River drainage in Western Wyoming has continued to furnish reasonably good native trout fishing for a large number of Utah and Wyoming fishermen, however, during the past two years this fishing has been excellent. Because of this, it has been felt by Wyoming fisheries management officials that the perpetuation of the cutthroat in these waters should be encouraged by every means possible. The establishment of a pure strain brood stock of cutthroat native to this drainage appears to be one effective way.

On March 20, 1953, twenty-nine thousand (29,000) cutthroat trout eggs, (334 per ounce) were taken from migrating fish in Flat Creek--tributary to the Snake River. These eggs were eyed and hatched at the Auburn Hatchery in a uniform temperature of 49°F. The mortality up to feeding time was about normal for this species (exact figures not available). The fry were fed liver with Cortland Mixture #6 throughout the first year. After the first year, a mixture of 60% meal and 40% liver was fed. When the fish were one year old (50 per pound) 528 fish from the lot were carefully selected as to size and transferred to an earthen raceway which was supplied with 49° F. fresh spring water. These fish spawned at the age of 34½ months. (normally three years is required for maturity.)

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On February 1, 1956, 125 females produced one hundred twenty-two thousand (122,000) eggs, (513 per ounce). The eggs were not picked until eyed. However Malachite Green flush treatments were used. A 42.6% mortality was recorded at this time. The resultant fry were weak and many of them failed to development. Examination of the brood stock showed fatty degeneration of the liver, undoubtedly caused by improper diet. As a result of this condition, 173 brood fish died during a two-week spawning period. The 355 remaining brood fish were kept for future spawning in order to determine the quality of future eggs and to obtain information on the span of egg productivity was also necessary.

Of the remaining seventy-seven thousand (77,000) eggs twenty-four thousand (24,000) died before the swim-up stage. The fry were fed liver for 30 days, then Cortland meal #6 was added gradually to the diet until a 50% meal and 50% liver was being fed. The food was mixed with a paint mixer attachment on a quarter-inch electric drill. This procedure mixed in enough air to make the feed float, thus giving the fry ready access to food at all times throughout the day.

At one year of age the remaining lot of 4500 fish had reached a weight of 45 per pound and were transferred to the same type of earthen raceway as the previous generation.

The diet was changed to Clark's 3/32 pellets and was fed according to their recommended chart level for rainbows.

When two years of age the remaining 4085 fish were 2.8 per pound. The lot was fin-clipped for age determination and transferred to a new earthen raceway with a gravel bottom ten feet wide by ninety yards long with an average depth of eighteen inches which was supplied with approximately two second feet of water. (Half used hatchery water and half creek water, the highest summer temperature being 56° F. and the lowest winter temperature 38° F.)

A spawning house 20' by 20' was built over the upper end of the raceway. Inside the house and extending out into the raceway a 7' by 40' wooden holding pen was constructed. A trap is placed in the holding pen at spawning time.

When the fish were three years old they began spawning on February 18, 1959. One million seventy-two thousand (1,072,000) eggs were taken from both the lots, first and second generation. Spawning covered a period of three and one half months.

Eggs taken from first generation fish (four year olds) which had fatty liver averaged 381 per ounce and 2000 per female. The mortality on these eggs to eyed stage was 50%.

Eggs taken from second generation fish (three year olds) averaged 479 per ounce and 976 per female. The mortality on these eggs to eyed stage was only 6%. Only 35% of the females matured and spawned at three years of age.

The mortality on the total lot of eggs and fish until planting time at an average of the 319 per pound was four hundred thirty thousand (430,000) or approximately 25%.

The fry of the third generation were fed a complete dry diet (Clark's) except for the first thirty day period when they were fed liver with a 10% mixture of fry fine meal. Dry food size was varied as the fish grew.

An average conversion of 1.9 pounds of food to procure a pound of trout was recorded.

Forty-four <sup>hundred</sup> ~~thousand~~ (4400) fish were kept from the earliest spawning three year old selected brood fish. At one year of age they averaged 24 per pound and when twenty-one months old, October, 1960 these fish were graded and 2900 (3.5 per pound) were selected and marked by fin clipping for year class determination when mixed with older brood stock.

There was no indication of a fatty liver condition in fish which were fed a complete dry diet.

SUMMARY

Selective breeding for improvement of Rainbow brood stock has been carried on ~~by a large number of trout culturists~~ since about 1883. Very little work of this kind has been done with our native stream cutthroat trout. Work described in this paper shows that this particular strain of cutthroat do respond well to proper hatchery procedures and that they do make comparatively good growth. Indications are that earlier dates of maturity can be encouraged and that brood stock can be improved generally.

The following chart summarizes data covered in this paper:

Fish Lot	No. fish		No. eggs per female	No. eggs per ounce	Total no. eggs taken	Total loss
	per pound					
* 1953	<u>1 yr.</u> 50	<u>2 yr.</u> 5	No record	334	29,000	17%
1956	45	2.8	976	513	122,000	42.6%
1959	24	2.2	976	479	1,072,000	25%

\* Eggs taken in 1953 were from wild fish.