HUNTER

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AN AIRLIFT FLOATING FISH TANK

by

Charles J. Hunter
National Marine Fisheries Service
Seattle, Washington

BACKGROUND

Apparent increase in demand for salmonid culture caused by declining runs, saltwater pen culture, increased Indian fishing and the recent interest in ocean ranching, will probably strain the capacity of the present hatchery systems. Many of the sites with good quality running water are presently being utilized for hatcheries, and much of the other running water resource in the Northwest is being used for recreation, homesites, etc.

Because of this possible shortage in good quality running water, we are in the process of developing a rearing system that will utilize an untapped water resource -- our still water -- lakes, ponds and reservoirs. Many of these contain good quality water and would provide adequate siting for fish rearing.

DESCRIPTION OF REARING SYSTEM

This system consists of round floating tanks and an air pump (Figure 1). Models were built of plexiglass but the production tanks were standard 4 foot fiberglass tanks made bouyant by attaching styrofoam to the exterior surface. These models, about 21" in diameter, were subsequently used for egg incubation.

The air pump supplied a water flow of about 5 gpm which entered the tank at the top in a circular motion and left the tank through a drain in the center of the bottom (Hunter, 1975).

EGG INCUBATION

The models were tested as egg incubators during the winter of 1974-1975. These tanks were 21 inches in diameter, 9 inches deep and held about 5 gallons of water. An aircraft system supplied 1.6 gpm of water exchange. This system took very little care except for occasionally checking the air supply and treating them once with malachite green dye at 2 ppm for 1 hour to discourage the growth of fungus.

Loading densities of 1.5 layers (4, 050) and 5 layers (13, 500) of chinook salmon eggs were tested. Approximately 99% of eyed eggs hatched absorbed their yolk sac and began feeding as swim-up fry, which we believe is as good or better than conventional systems.

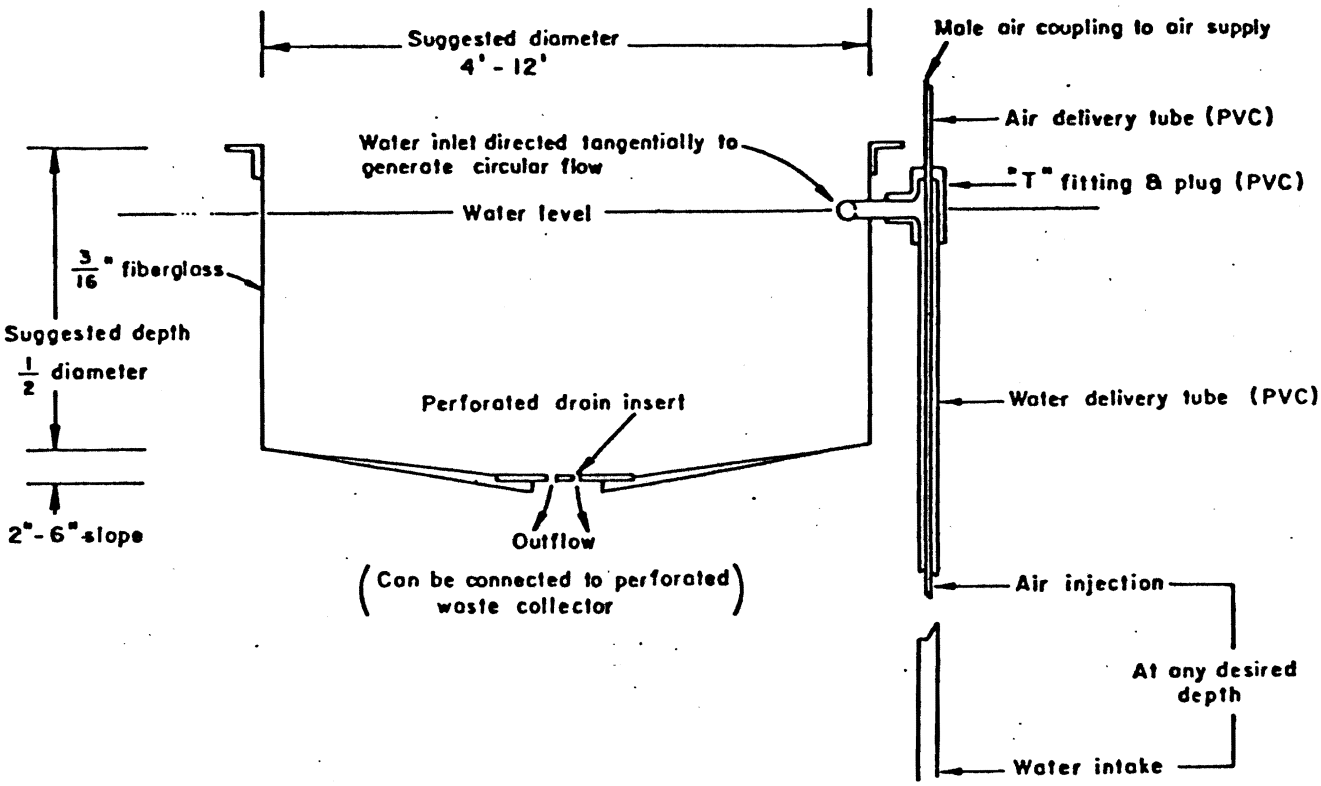

Figure 1.--Airlift floating fish tank.

These preliminary tests indicate this system, using water from lakes, ponds or reservoirs, has considerable promise.

REARING JUVENILE SALMON

During the spring of 1975, 8 groups of chinook salmon were reared in airlift floating tanks at Portage Bay, a 40 acre appendage to Lake Union, adjacent to the Northwest Fisheries Center in Seattle. These tanks were the standard 4 foot round fiberglass type commonly used in fisheries. Floating in the lake, they could accommodate 18 inches of water and contained about 140 gallons. An airlift pump was adjusted to supply a 5 gpm exchange rate although greater flow was possible from the same air system.

This study included 4 densities and 2 age groups (Table 1). The older fish were started at 329 per pound and the younger fish at 632 per pound. They were fed Oregon Moist Pellet Feed at a maximum useable rate. The study was conducted over a four week period and then had to be terminated because of an untimely power failure. Mortality and growth rates of the various loading densities and age groups are shown in Figures 2 and 3. The younger fish were judged to have a poorer condition factor which may have been partly responsible for the lower performance in that group.

Based on these preliminary data it seems reasonable to expect that at least 5, 000 chinook salmon could be reared to the smolt stage in a 4 foot tank with a mortality rate of 2% per month and a growth rate of 2. 8% per day.

CONCLUSION

Use of still water for incubating salmon eggs and rearing juveniles to the smolt stage has been shown to be a practical system and may provide valuable supplemental space for our present hatchery system.

Table 1. Loading density, mortality and growth rate of chinook salmon in airlift floating tanks during the period April 30 to May 28, 1975.

Density (pounds/ cubic ft.)	Total Pounds	Estimated number of fish		Mortality		Growth rate (%)
		(329/pound)	(632/pound)	No. of fish	%	
1.6	30.34	9, 982	--	474	4.7	71
1.0	17.50	5, 757	--	117	2.0	83
0.5	8.74	2, 875	--	43	1.5	104
0.25	4.37	1, 438	--	46	3.2	150
1.6	30.34	--	19, 175	12, 200	63.6	-7
1.0	17.50	--	11, 060	1, 295	11.7	29
0.5	8.74	--	5, 524	202	3.6	84
0.25	4.37	--	2, 762	113	4.1	76

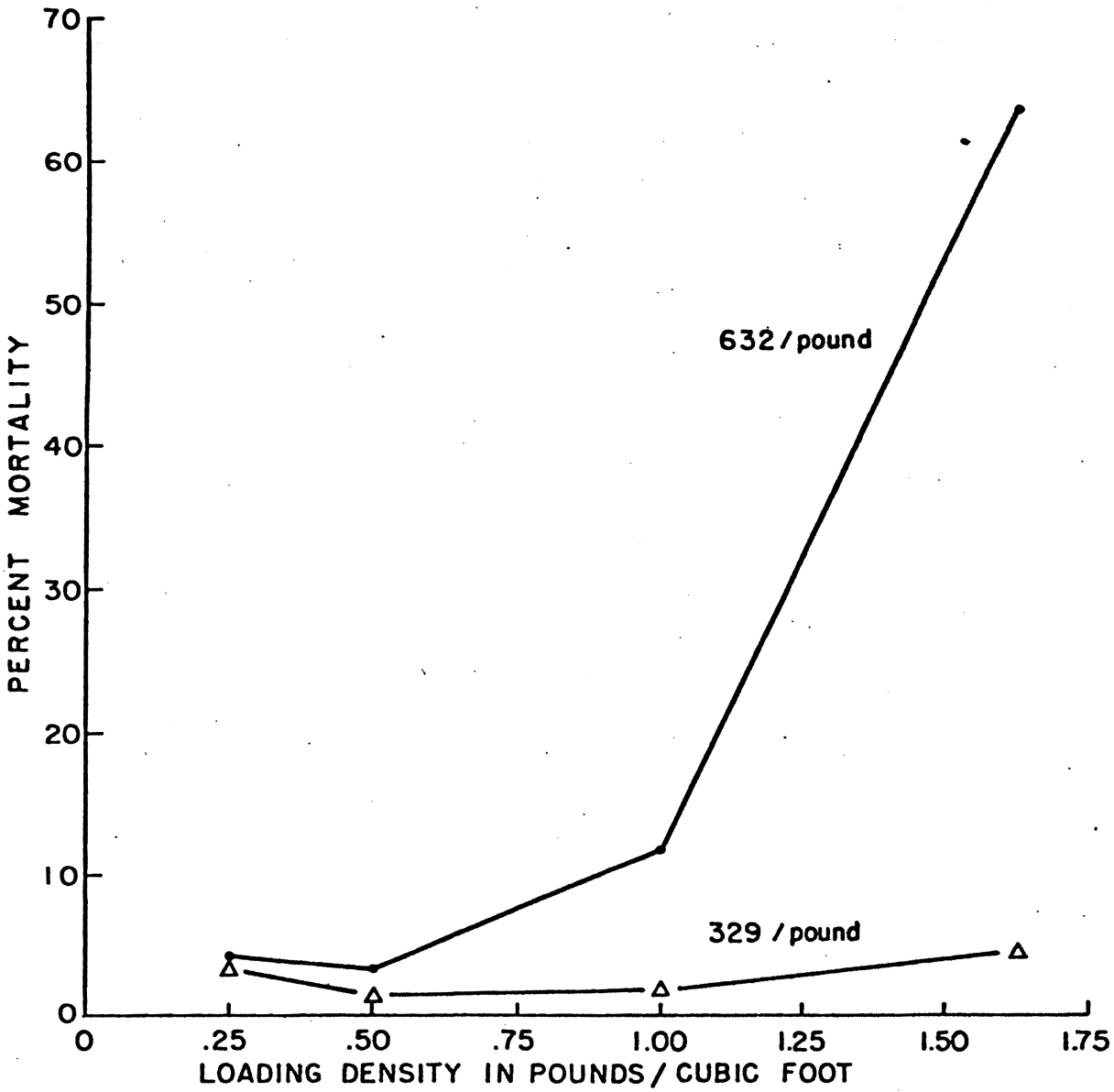

Figure 2.--Mortality of chinook salmon in airlift floating tanks during the period April 30, 1975 to May 28, 1975.

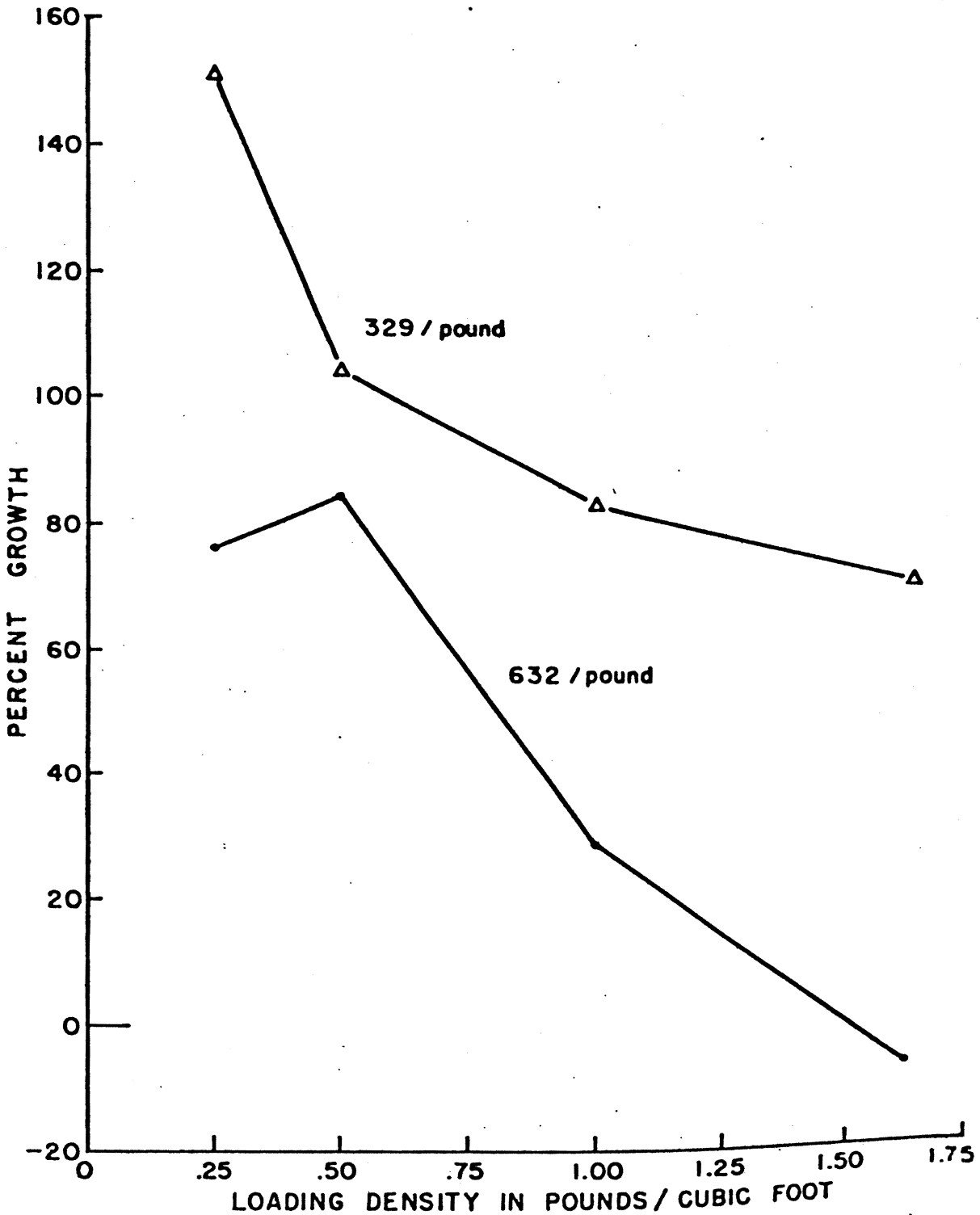

Figure 3.--Growth rate of chinook salmon in airlift floating tanks during the period April 30, 1975 to May 28, 1975.

LITERATURE CITED

Hunter, C. J., and T. Joyner. 1975. A self-cleaning floating fish tank. The Prog. Fish-Cult. 37(2): 115-116.