

Fishpond Management

HATCHERY AND RACEWAY FOR GROWING TROUT

In the State of Oregon

A small fish hatchery and raceway is easy to construct and operate with a relatively small, dependable water supply. A sizable hatchery is more complicated and requires a larger, constant water supply.

Hatchery

Eyed trout eggs are easy to hatch and much cheaper than fish. Eyed eggs cost about \$5 per thousand while fingerlings cost from \$40 to \$60 per thousand. Any surplus hatch can be sold to neighbors who have ponds. Anyone who sells fish needs a \$5 hatchery license issued by the State Game Commission.

Water Supply: Any spring, diverted stream or pumped well water supply will do if it is of good quality, is properly aerated and has a relatively constant temperature of 45° F to 62° F. The amount of water for a trough with 3 baskets (100,000 eggs) should be 5 to 15 gallons per minute. As the temperature increases, an increased amount of water is needed.

Hatchery Trough: The standard hatchery trough is 10 feet long, 16 inches wide and 7-1/2 inches deep, and is constructed of 2-inch material.

Egg Baskets: The standard egg-holding basket is 24 inches long, 15-1/2 inches wide and 6 inches deep. Mesh size of basket for rainbow trout eggs is about 7 meshes per inch. Each basket will hold approximately 35,000 rainbow trout eggs.

The hatchery trough should have a 1-inch fall in 16 feet. The baskets are constructed under a rectangular wood frame which rests on top of the hatchery trough. A trough 10 feet long can hold 3 baskets (100,000 eggs). The trough is constructed of 2-inch lumber and should be water-tight. From 5 to 15 gallons of water per minute should pass through the trough. Thin metal dividing plates which (1) hold water level at proper height, and (2) allow water to upwell under hatching basket and can be arched in place. See attached drawing. The use of galvanized material should be avoided, as zinc in very small concentrations is lethal to trout.

When trout hatch, it takes about two weeks or less to absorb the attached yolk sack. At the end of this time the fish actively swim up and will accept food. Liberate young fish in hatchery trough and feed until fish become more active and stronger (up to a month or more). Next, place them in a compartment of the raceway and, as the fish become larger, allow them to use all of the raceway.

Feeding: A number of feed companies offer pelleted fish foods and instructions for feeding are provided. An automatic "fry feeder" can be purchased, that periodically drops a specific amount of food at any time interval desired. It is very useful for feeding young trout during the first month or longer when it is necessary to feed small amounts at frequent intervals.

Raceways

Concrete raceways offer many advantages for growing young trout to stocking size. Some of these advantages are as follows:

1. A concrete raceway can be compartmented allowing fish to be graded for size and collected easily.
2. A raceway permits easy feeding and efficient water use and control.
3. A concrete raceway can be easily cleaned and treated for disease and parasites.
4. A raceway can be covered to keep out fish-eating birds and other forms of predation.

Raceways can be constructed of earth, concrete or of concrete blocks. Earthen ponds are often used, are less expensive to build, but are not as easy to manage. Water should be from 2-1/2 to 3 feet deep in raceways, which may be any convenient width or length (commonly 3 to 10 feet wide and 20 to 100 feet long). The raceway should have a 1-inch fall each 20 feet of length. Capacity of raceways for rearing fish depends on (1) water volume, and (2) fish size. No more than 2 pounds of trout should be allowed per cubic foot of water. The number of trout per pound varies with fish size. The following table gives average length-weight relationships:

If length of trout is:	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"
The number of fish per lb. will be:	2500	300	90	40	20	12	7	5	4	3

Example: A raceway 20 feet long, 5 feet wide with 3 feet of water depth contains 300 cubic feet of water and can handle 600 pounds of trout. If the fish are 2 inches long, the capacity of the raceway is 180,000 trout. If the fish are 8 inches long, the capacity of the raceway is 3,000 trout. In planning number of fish needed allow for growth and some natural mortality. See SCS Technical Note No. 9.

Water Supply: An ideal raceway water supply should provide about 1 to 2 changes of water per hour. A water supply of from 100 to 400 gallons per minute is ample for the size raceway shown. Even less water can be used if fish are not crowded. Any spring, diverted stream or pumped well water supply will do if it is of good quality, well aerated and less than 70°F.

Water Supply for Large Hatchery: Hatchery experience in Oregon suggests the following water supply would be ideal for most large hatchery operations.

Production - 2 lbs. of fish per cu. ft. assuming 3 water changes per hour.

Capacity - 6 ft. wide X 100 ft. long X 2.5 ft. deep = 1500 cu. ft.
1500 cu. ft. X 2 lbs. = 3000 lbs. fish per raceway.

Water - 1500 cu. ft. X 3 changes per hour = 4500 cu. ft. per hour,
or 1.25 cu. ft. per second,
or 560 gals. per minute.

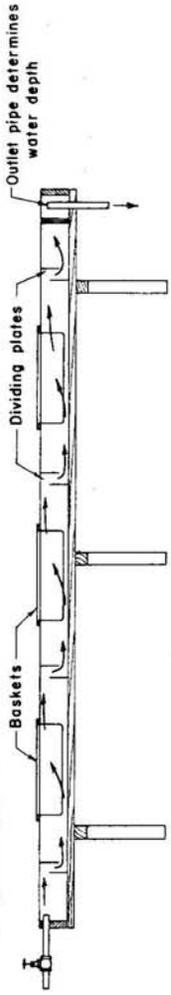
General Information: Do not crowd rearing fish. Crowded conditions can cause disease problems.

Extremely helpful advice on raising trout is available at state or federal hatcheries where the personnel will often take the time to answer questions.

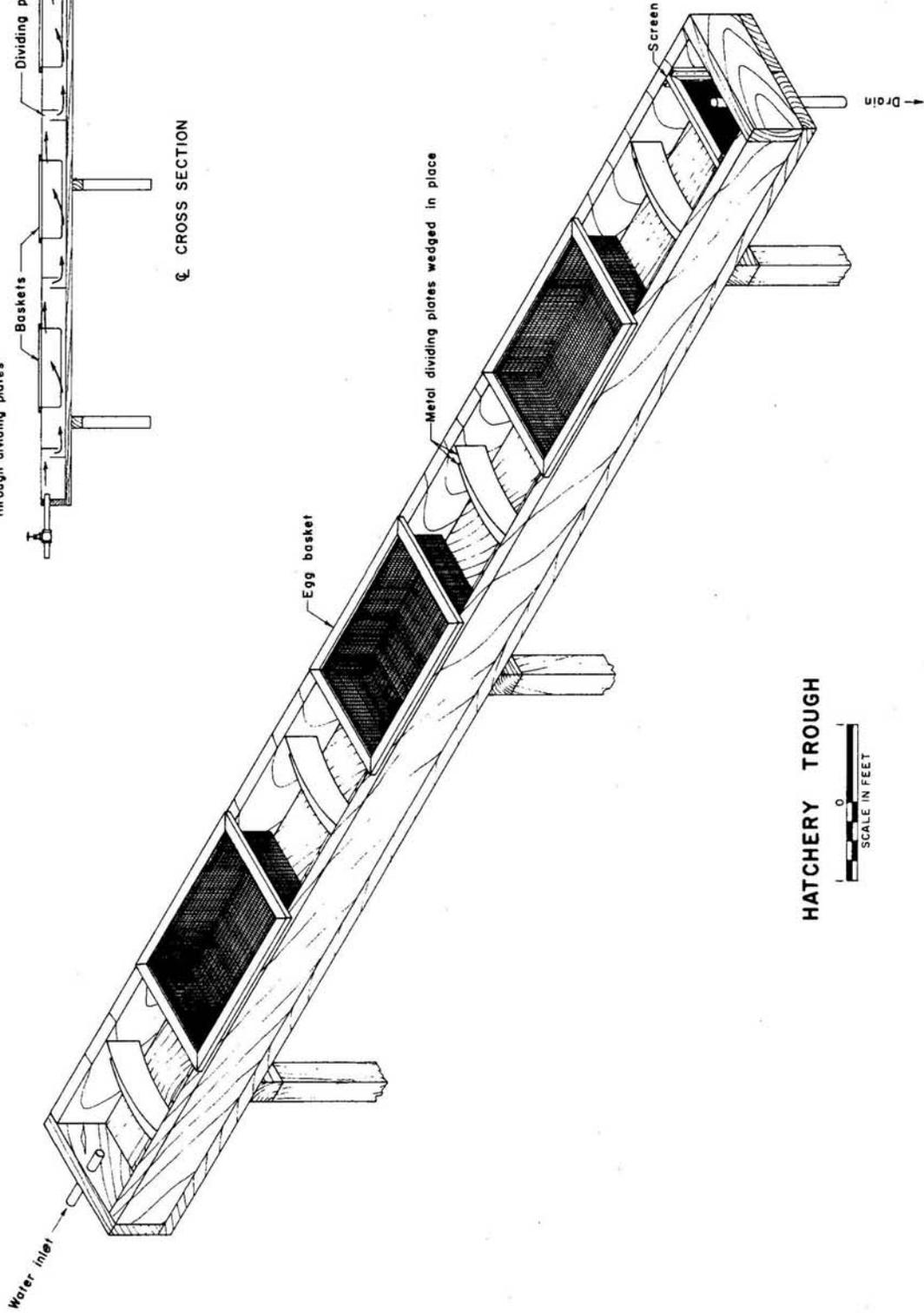
The Soil Conservation Service State Biologist can be of help to anyone wishing more information.

Attachments

Note: Arrows indicate water flow through dividing plates



⊘ CROSS SECTION



HATCHERY TROUGH



