

Floating Cages for Fish Culture

J. GLUCKSMAN, Freshwater Fisheries Biologist

Fish cages are useful for holding fish in a stream, river or lake, where it is not convenient to build fish ponds. They are also useful for holding fish caught in larger waters. Keeping "caught" fish alive is an excellent solution to the preservation and distribution problems found throughout Papua New Guinea.

IN some areas it is difficult to build fish ponds because the only land available is very steep. In other places there are extensive natural waters such as large rivers or lakes which are suitable for fish culture, but are too large to be managed. In large areas of water, or in running streams where there is no shortage of oxygen, a fish cage is the answer.

An ideal design for a fish cage is given in Figure 1. The cage is a box with wire mesh sides and floor, and a wooden cover. The box has styrofoam floats at the top on each side so that the cage floats, but only the top is above the water. Since the sides of the box are of wire mesh, the water continually passes right through the box, so the fish have a never-ending supply of oxygen.

The cage shown in Figure 1 has a frame of 2 in by 2 in hardwood, and the sides are made of $\frac{1}{2}$ in by 1 in welded mesh, 16-gauge, galvanized wire. Floats are blocks of styrofoam, 10 in in cross-section. A 10 in wide strip of aluminium screenwire is attached at the water-line to prevent food from floating out of the cage. The cover is made of plywood and has a hinged door for feeding.

All sorts of local materials may be used instead of those listed above. For example, metal sheeting or planks can be used instead of plywood, plastic bottles or light wood can replace the styrofoam, and split bamboo or woven pitpit can be used for the sides and bottom. If pitpit or split bamboo is used, the

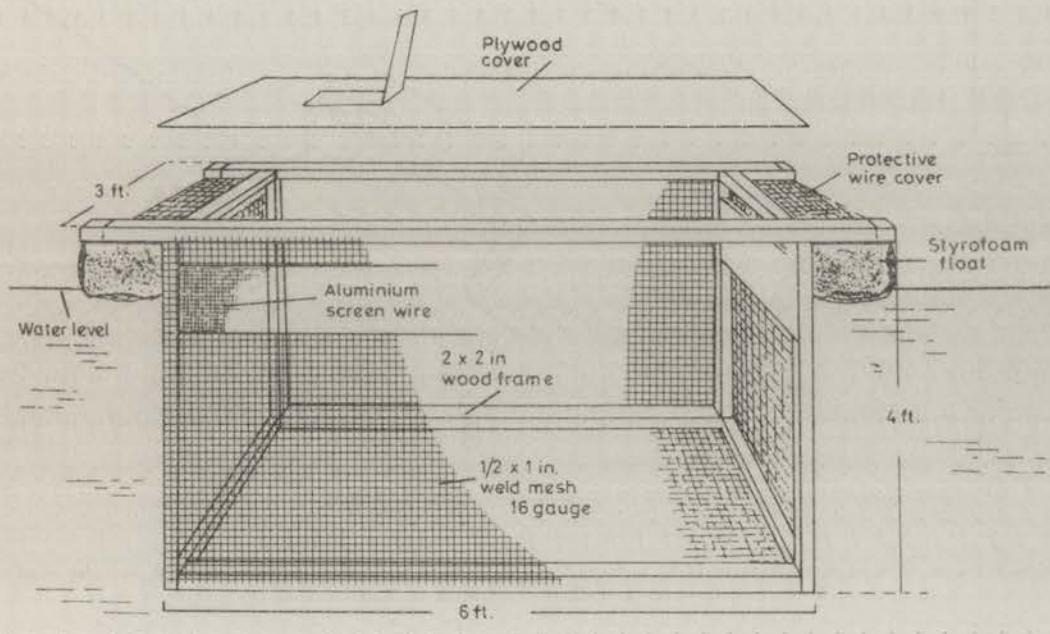


Figure 1.—A suitable design for a floating fish cage

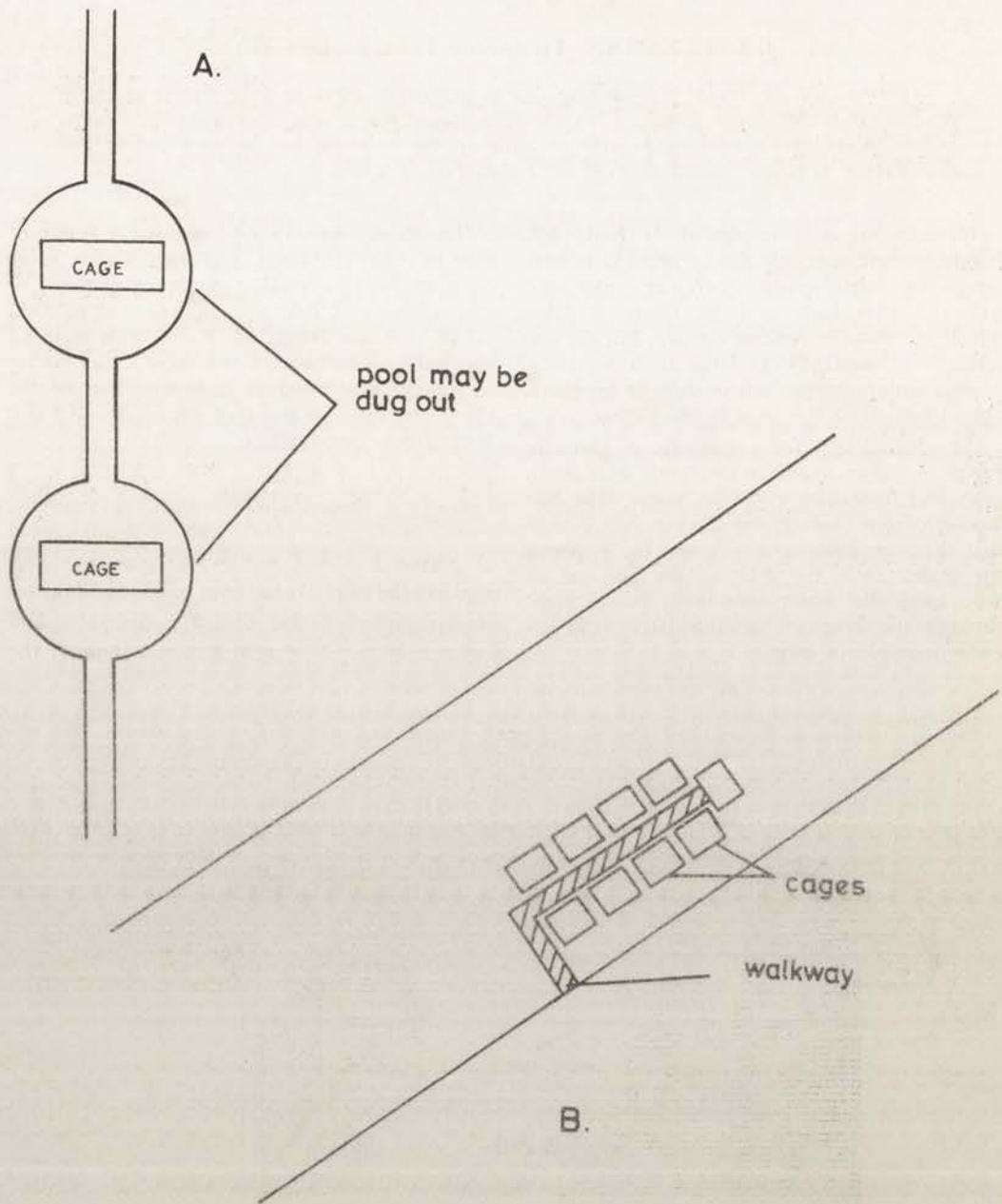


Figure 2.—A. A narrow stream may be enlarged at one point to make it wide enough for the cage. B. On a wide river a walkway is useful to reach the cages

cage will not need floats and may need stones for ballast, to keep the cage deep enough in the water.

Cages can be made to larger dimensions than those given in *Figure 1*, as long as the same proportions are used. (There is less work in making one large cage than two small ones.)

The cages are floated at least 6 to 12 in free of the bottom. A cage of the dimensions given in *Figure 1* can be stocked with up to 160 fingerlings (5 in or larger) or 80 per cubic yard. At this density the fish can grow to a size of 1.5 lb without being overcrowded. The fish in the cage require more oxygen than would free-swimming fish. Cages can be used only in running or large waters. They cannot be used in small stagnant fish ponds (see *Figure 2*).

Feeding

Caged fish do not have access to any natural food. They must be fed regularly, and properly. Golden and Cantonese carp can consume up to one-fifth of their body weight daily so the ration must increase as they grow. Food must include protein and carbohydrate. For carp, a

ration similar to that fed to pigs will result in very good growth. Cheap local sources of protein include maggots, ants and ant eggs and insects captured at night with a light. Sources of carbohydrates are sweet potato, taro, tapioca, broken rice or rice bran, and corn. The fish can be fed as many times daily as they will take food.

Tilapia

Tilapia do not grow very large when they are kept in ponds, because of their tendency to reproduce at a size far below that desirable for the table.

Recent investigations have shown that tilapia grown in cages suspended in a pond will not reproduce, both because the altered environment interferes with egg fertilization and because the eggs, which must be incubated in the mother's mouth, drop through the cage floor.

Tilapia may be stocked in cages at about twice the rate of carp and must be fed similar foods, well pulverized, regularly.

With stunting eliminated, tilapia are ideal for fish culture because of their fast growth, good food conversion ratio and hardiness.