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Summary of Arguments in Favor of and Against Use of a Hydraulic Escalator Dredge for Harvest of Hard Clams in Virginia with a Short Statement on Operation of the Machine

Virginia Institute of Marine Science

SUMMARY OF ARGUMENTS IN FAVOR OF AND AGAINST USE OF A HYDRAULIC ESCALATOR DREDGE FOR HARVEST OF HARD CLAMS IN VIRGINIA WITH A SHORT STATEMENT ON OPERATION OF THE MACHINE.

Intended as background material for student in preparation of a class report on the subject.

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ARGUMENTS IN FAVOR OF USE OF ESCALATOR DREDGE

1. Very efficient for harvesting clams
    a. It can pick up between 50-100 clams per minute.
    b. Two men working with it can harvest 5-7 times the number of clams harvested by a single man operating conventional patent tongs.
    c. It can cover a much larger area in one day than can be covered with patent tongs. This makes it easier to locate the best clam beds.
    d. Escalator can work in heavily-shelled bottoms with much greater efficiency than can patent tongs.
2. Greater efficiency of the escalator results in a better position for competition with clammers from other states where use of hydraulic escalators is permitted.
3. Operation of the escalator is physically easier on the clammer than is operation of patent tongs.
4. It may be used to harvest low-density clam populations that patent tongers would not usually consider profitable.
5. Escalator is most efficient in shallow areas (less than 15 feet in depth) allowing patent tongers to work deeper areas.

6. Modification of the bottom and its populations may be no different than that caused by patent tongs; except in terms of the area covered per unit of time. (Speculation; not known at this time.)
7. Strict regulation of operations of the escalator could limit its effect on the market and on bottom populations of clams.

ARGUMENTS AGAINST USE OF ESCALATOR DREDGE

1. It may place patent tongers at a competitive disadvantage in the market place, possibly driving them out of work.
2. Unless strictly regulated by law, the escalator will cover large areas in a much shorter time than would patent tongs and thus possibly reduce clam populations in large areas to very low levels or to nearly zero (depending on selectivity of clam size by operator). Reduction of clam populations is a slower process when patent tongs are used. The strength of this argument will vary according to the number of escalators and of patent tongs involved.
3. Use of the escalator could possibly result in the clam market being dominated by a few individuals. Patent tongs permit more individuals to share in the profits derived from the resource.

4. The much greater number of clams brought up by the escalator per unit of time could lower the price of clams significantly. The effect of such a change would be harder on patent tongers because the volume of their catch is so much lower than that of the escalator.

5. If regulations enacted to restrict use of escalators are not enforced effectively its effect on the market and on bottom populations of clams could possibly be undesirable. (This is strictly speculation.)

SUMMARY

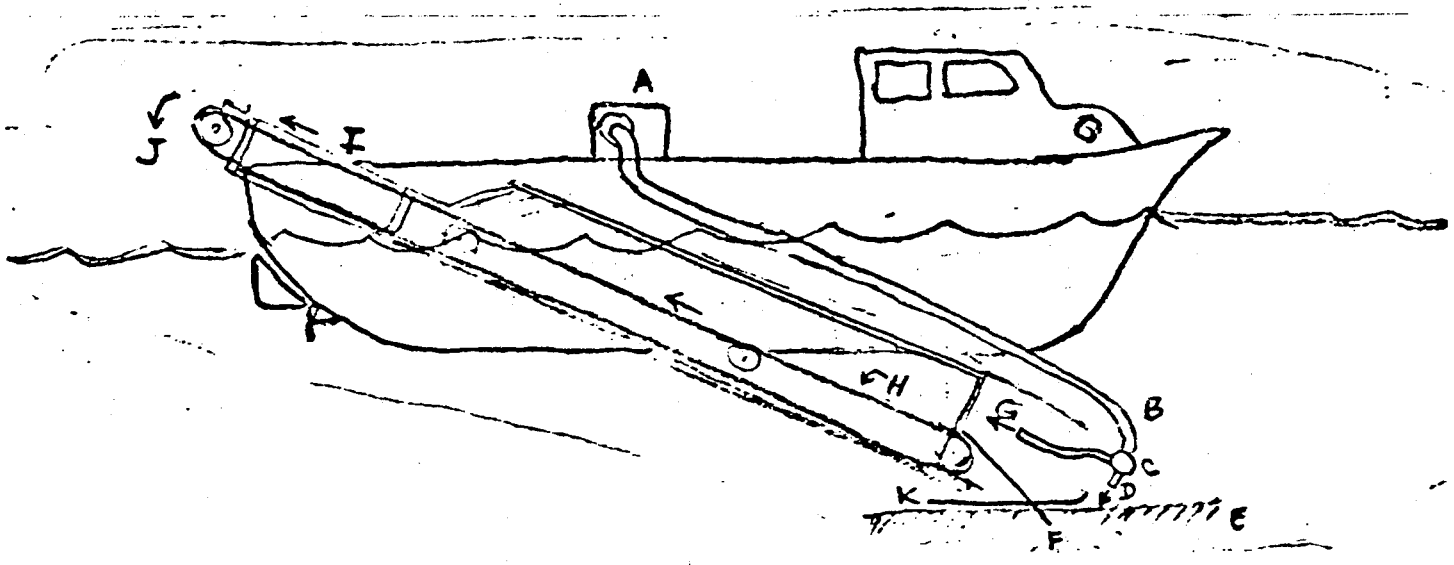
It is possible that the main effect of use of the hydraulic escalator dredge will occur in terms of socio-economic factors with the greatest harm possibly falling upon the individuals that operate patent tongs.

Effects of the escalator or patent tongs on populations of organisms living on and in the bottom has not been studied completely at this time. Scientifically controlled studies have to be conducted before the impact of these machines on bottom organisms can be determined.

In summary, it must be kept in mind that many of the arguments in favor and against use of the hydraulic escalator dredge are at present generalized speculations not supported by complete biological, sociological or economic studies.

HYDRAULIC ESCALATOR CLAM DREDGE

Boat moves ahead slowly all the time



OPERATION

Water is pumped from opposite side of boat using a pump on boat deck (A) through a hose (B) to a manifold (C) at the head of the escalator dredge. Water jets out of the manifold through ten short pipes (D) into the river bottom ahead of the dredge cutting blade (F). This loosens the bottom sediments and allows the dredge to cut through them with ease. As the blade moves ahead through the bottom,clams are guided into a conveyor belt (H) by the blade and a jet of water (G) from the manifold. The liquified sediments are not usually picked up by the conveyor belt. They fall back to the bottom near the point where they were picked up by the conveyor belt. The conveyor carries the clams upward to the surface where they are picked off by clammers on boat deck at point (I). Shelly material and clams not picked off fall back into the water to the bottom off the end of the conveyor belt (J).

When not in operation the escalator dredge is hoisted out of the water and secured to the side of the boat.

The head of the escalator dredge has sleds to keep it riding over the bottom surface (K). The cutting blade extends 6 inches below the sleds thus limiting penetration of the blade into the bottom to that depth.