OUTLINE OF A PROPOSED INVESTIGATION OF THE EFFECT OF THE DISPOSAL OF WASTE SULPHURIC ACID ON THE POPULATIONS OF LARGER BOTTOM ANIMALS

A. THE PROBLEMS.

The controversy which has arisen over the proposal to dump some 3,000 tons per day of waste sulphuric acid (about 8 percent concentration) in the offshore waters southeast of New York City starting in late February 1948, makes it desirable to learn the effects of such dumping. As a part of the study it is proposed to learn the association, if any, between the commencement of the disposal and the changes in the numbers of the larger bottom organisms.

Photographic census methods will be attempted. No other method appears to be practical. Satisfactory submarine cameras are available but have not been used for this purpose before. Therefore, a second objective will be to develop further submarine photography as a method of census for larger bottom organisms.

B. METHODS AND CONDITIONS OF OBSERVATIONS.

It is necessary to learn the causes of changes in the number of bottom animals. Changes probably will occur because of seasonal factors. In order to separate acid and seasonal factors it will be necessary to determine the number of bottom animals in the acid disposal area and in a nearby control area which presumably will not be affected by the acid. Because a region known as the "Mud Hole" is at a convenient distance and is an important sport-fishing ground, it is proposed to select a one-square-mile area in the center of this "Mud Hole" as a control area. In order to further separate acid and seasonal factors it is proposed to repeat the study in the winter and summer seasons for each of two years.

Experience with black and white and color photos indicates that it will be

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desirable to use both films. The black and white is the best for the uneven lighting conditions encountered, whereas the color may aid in identifying organisms.

With these things in mind it is proposed to:

1. Obtain about 200 photographs of the bottom, each covering a similar area.
2. Take these photographs at locations uniformly distributed over the dumping area and the control area. About half of the photographs in each area will be color photographs.
3. Operate a small bottom grab at each camera station which may provide an additional series of samples suitable for quantitative analysis, but which will at least provide specimens of the animals for identification.
4. Perform the photographic and grab sampling as described above in conjunction with other work in February 1948, August 1948, February 1949 and August 1949.

C. DETAILS OF OPERATION.

Personnel

William F. Royce, In Charge, U. S. Fish and Wildlife Service

Edgar L. Arnold, Jr., Field Assistant, U. S. Fish and Wildlife Service

Karl Hayes, Preparation of Equipment, Woods Hole Oceanographic Institution

Lloyd Moadley, " " " " " " "

Technician, Analysis of Photographs and Grab Samples. Estimated two months total time required for all four trips. Woods Hole Oceanographic Institution.

Equipment

All to be supplied by Woods Hole Oceanographic Institution for trip in

February 1948.

Vessel Balanus

Submarine camera, with spares

Photographic supplies:

Black and white film: 10 rolls #620

Color film: 10 rolls #620

Flashbulbs: 250 GE No. 5

Field developing equipment for black and white test shots: tank and chemicals

Bottom grab

Strainer of ¼" mesh hardware cloth

Collecting jars: 1½ dozen pint, mason; 2 dozen quart, mason

Formalin: 2 gallons

Log sheets

Bottom sampler on camera pole (samples for another study)

Coring tubes

Log sheets

Instructions on number and method of handling samples

Schedule

Hayes and Headley will prepare and test all photographic and collecting equipment and place it aboard the Balanus for the trip to New York on February 2, 1948.

Hayes and Arnold will meet the Balanus at New York on February 16, 1948 to begin first series of observations which are expected to require about one week.

Woods Hole Oceanographic Institution will develop and print films and Royce and Arnold will identify the animals and make a preliminary study of the pictures, February 23 to March 10.

Royce and Arnold will arrange the work of technician at Woods Hole Oceanographic Institution, analysis of data, preparation of preliminary report with recommendations for changes in technique and subsequent schedules, March 10 - 31.

D. METHOD OF ANALYSIS.

1. Identify the animals in the grab samples and photographs and count them.

2. Calculate average numbers and compare areas and seasons.

E. KIND OF REPORTS.

1. Scientific reports should include:

   a. The effect of the acid disposal on numbers of organisms.

   b. Use of photography for census of larger bottom animals.

2. Semi-scientific accounts should be prepared for trade magazines and newspapers on each of the above subjects.

Prepared by:

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U. S. Fish and Wildlife Service

January 30, 1948.