

tagging study. No "rule of thumb" could be established with relationship to length and weight losses as a result of freezing.

Spaghetti tags located in the pre-maxillary had only 13.6% heavy infection, where the dorsal had 28.0%. One must conclude that Spaghetti tags located in the pre-maxillary are the best suited for Florida waters.

This study will be extended over a longer period of time to verify the results obtained and to further evaluate these tags.

ACKNOWLEDGMENTS

Special recognition is due to my worthy Assistant, Mr. Dale Walker, and to all employees of the Florida Game and Fresh Water Fish Commission who contributed greatly to this program.

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COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT

Act of 1964 (PL 88-309)

By I. B. BYRD

Federal Aid Coordinator

United States Department of Interior

Bureau of Commercial Fisheries

St. Petersburg Beach, Florida

Presented Before

Annual Meeting of Southern Division of

American Fisheries Society

Held In Conjunction

With

Southeastern Association of Game and Fish Commissions

Tulsa, Oklahoma

October 11-13, 1965

The primary purposes of the Commercial Fisheries Research and Development Act of 1964 are to allow Federal-State cooperation in carrying out projects designed for the research and development of commercial fisheries resources of the nation; and to supplement and increase the amounts of state funds appropriated for commercial fisheries.

State funds used for matching monies must be additional funds for research and development projects and not funds diverted from existing commercial fishery projects. However, regulations provide that it will not be necessary for a state to use new funds to match the federal

contributions during 1965 and 1966 fiscal years if its legislature did not meet for a significant and practicable period of time after the appropriation of federal funds for the Act.

Cooperative projects between states along with needed compacts and agreements for these projects are provided for in the Act.

The Act authorized the appropriation of funds to the Secretary of Interior for a period of five years beginning July 1965 to carry out the purposes of this legislation. Annual amounts authorized were:

- (1) Section 4(a): \$5,000,000 to be apportioned to states as the federal share for costs of research and development projects.
- (2) Section 4(b): \$400,000 to \$650,000 for restoring commercial fishery failures caused by resource disasters arising from natural or undetermined causes.
- (3) Section 4(c): \$100,000 for developing a new commercial fishery.

The resource disaster and new commercial fishery funds provided for in Sections 4(b) and 4(c) do not require state matching monies.

This legislation did not appropriate funds. It simply authorized appropriation. The first amount appropriated under this Act was \$400,000 in fiscal year 1965. All of these funds were used to alleviate a commercial fishery failure in the Great Lakes Chub industry.

A total of \$4,800,000 was appropriated for the purposes of the Act for the present fiscal year 1966. Of this total, \$4,100,000 was for the federal share of the cost of research and development projects under Section 4(a); \$400,000 for commercial fishery failures under Section 4(b); and \$300,000 for the administration of the Act by the Bureau of Commercial Fisheries. No funds were appropriated to implement the new commercial fishery portion (Section 4(c)) of the Act during the fiscal year 1966.

The \$4,100,000 apportioned to the states was made according to the formula in the law which reflects the relative value of commercial fisheries industry in each state. These apportionments are based on the three most recent calendar years for which data satisfactory to the Secretary of Interior are available. No state may receive an apportionment for any fiscal year of less than one-half of one percent of the funds or more than six percent of the funds. For fiscal year 1966, the sum received by an individual state ranged from a minimum of \$20,500 to a maximum of \$246,000.

An apportionment for any fiscal year remains available to states for a period of two years to be obligated for approved projects. If the funds are not obligated within a two-year period, they are returned to the Treasurer of the United States and not to a program pool for future use.

Only those state agencies designated by the governors of the respective states are authorized to submit fishery research and development projects to the Bureau of Commercial Fisheries for approval. However, other agencies or institutions may submit projects through the official state agencies.

Cooperative projects between states should be considered by the state agencies whenever possible. Carefully planned and executed cooperative research projects to investigate species and conditions common to several states would no doubt provide for more economic financing and a more efficient use of available research personnel. Certain types of estuarine studies, fish and shellfish disease and parasite investigations, blue crab studies and catch statistics are examples of projects that are worthy of consideration for cooperative study between states.

Commercial fisheries research and management project proposals should be submitted to our Regional Office at St. Petersburg Beach, Florida. Every effort will be made to complete review and evaluation for all projects as quickly as possible after they are received.

No funds are committed by the submission of the project proposal. Funds are obligated only upon the approval of the project agreement and the plans, specifications and estimates by the Secretary. Forms for submitting a project agreement and plans, specifications and estimates

are forwarded to a State from the Washington Office of the Bureau following the approval of the project proposal.

Projects submitted must be directed toward an economic improvement of the domestic commercial fishing industry. Such projects should ultimately improve the productivity of the fisherman or processor; expedite early diversification of an existing industry or establishment of a new industry; or lead to increased consumption of domestic fishery products.

Approvable projects may include but are not limited to the following types of activities:

- (1) Accumulation of knowledge for the optimum utilization, restoration, or maintenance of a resource or group of resources.
- (2) Location of new resources and the development of new fishing methods and equipment.
- (3) Handling and processing of fishery products.
- (4) Economic studies.
- (5) Market promotion and development aimed at trade channels above the consumer level.
- (6) Construction of research facilities and vessels.
- (7) Coordination of research and development.
- (8) Technical extension activities to disseminate the useful results of research and development projects.
- (9) Collection, compilation and dissemination of statistics.

The following types of projects are not approvable:

- (1) Projects from which the benefits appear to accrue only to a single individual or firm or to a relatively few individuals or firms.
- (2) Projects dealing with law enforcement operations.
- (3) Projects of a public relations nature; except that well-planned extension activities which will disseminate research and development results to the commercial fishing industry will be considered.

Certain restrictions will apply to projects which may be submitted by the state agency. Examples of such restrictions are as follows:

- (1) No funds may be used for construction of facilities or vessels to be primarily for commercially harvesting, handling, or processing of fishery products.
- (2) Funds obtained from other federal agencies shall not constitute any part of the state contribution to projects approved under this Act, unless specifically so provided by the Congress.
- (3) Projects funded by this Act shall not be more than three years in duration. Extensions beyond three years may be considered after a comprehensive review and resubmission of project documents.

Projects must be substantial in character and design in order to be considered for financing under this Act. The major criteria to be used in establishing such substantiality are as follows:

- (1) Responsiveness to basic economic problems of the commercial fishing industry segment involved.
- (2) Condition and potential of the resource involved.
- (3) Current and potential value of industry segment(s) involved.
- (4) Competence of research organization, and availability of necessary facilities.
- (5) Extent of similar state and federal research development previously conducted or in progress.
- (6) Length of time and total cost to complete projects.

(7) Availability of financing from other sources.

If, on the basis of the above evaluation, a project appears to be substantial in character and design, it will be recommended for approval at either 50 or 75 percent federal funding. Such projects may be funded at the 75 percent level if they are regional, national or international in scope. If such projects are of limited local (intrastate) scope, they may not be funded at more than the 50 percent federal level.

The excellent response of the fishery administrators and biologists of the states to the PL 88-309 program has been most gratifying. This continued interest in the program will help insure sound, well-planned projects that will lead to the development of the commercial fishery resources in the respective states and subsequently in the nation.

FISHERIES TECHNOLOGICAL RESEARCH IN THE GULF OF MEXICO BY THE BUREAU OF COMMERCIAL FISHERIES

By TRAVIS D. LOVE

ABSTRACT

The research function at the Pascagoula Technological Laboratory is described. The staff, the equipment, and the microbiology and chemistry programs are briefly discussed.

Biochemical studies of fish and shellfish are a major program at the laboratory. The deterioration of fresh iced shrimp was studied recently by following the increase in pH, analyzing the amino acid, hydroxyproline, and evaluating the variation in the nitrogen values of fractions eluted by different solvents.

Microbiological studies accompanied the biochemical studies. Daily total plate counts demonstrated the increase in microorganisms as the shrimp became less acceptable as a food. Fluctuations in the types of organisms present were shown to be related to the changes that took place in the iced environment as the salinity—and the marine bacteria—decreased.

Microscopic studies on histological sections of the shrimp flesh showed that collagen in the connective tissue deteriorated as tissue integrity was lost. Bacterial invasion of the tissue accompanied destruction by the enzymes.

The study has culminated in an Industry-Government Symposium, where research results will be presented.

INTRODUCTION

Technological research in the Bureau of Commercial Fisheries is concerned with the study of marine products from the point of catch to the ultimate consumer. Handling, processing, storage, and transportation of seafoods are studied through applied research projects at the Pascagoula Technological Laboratory. A more basic type of research probes the biochemistry of protein degradation. Microbiological studies follow changes in bacterial population as the seafoods are processed and handled. The following research projects are current at Pascagoula.

I. MICROBIOLOGY

A. *Botulism Studies*

Several times in the past, botulism has been implicated in deaths following ingestion of seafoods. Type E *Clostridia botulinum* is considered to be the usual causative organism in marine products. Following the outbreak in 1963, the Pascagoula Laboratory began a study of

Author note.—Travis D. Love, Laboratory Director, Bureau of Commercial Fisheries Technological Laboratory, Pascagoula, Mississippi.