EXPERIMENTAL STUDIES

These studies are concerned with certain problems best studied in the laboratory that will enable better interpretation of data collected from a wild population. The nature of growth and its periodicity in fishes, the factors that cause mortality in larval fish and similar studies will be carried out. The personnel assigned to this group are also concerned with the management of the aquarium. The techniques used in these two studies are similar and the problems related.

August 6, 1959

SUMMARY CO[illegible] OL SCHEDULE

Investigation: Experimental studies
Biological Laboratory: Woods Hole, Mass.

	Project Title	Est.* Cost	Fiscal Years									
			57	58	59	60	61	62	63	64	65	66
1.	Lab techniques for culture of Marine fish	78.4	--	--	--	14.2	10.3	9.4	11.6	9.7	10.6	12.6
2.	Rate of ascent to Pelagic eggs	23.7	--	--	--	13.3	10.4	--	--	--	--	--
3.	Sustained swimming rate of larval fish	17.3	--	--	--	--	9.1	8.2	--	--	--	--
4.	Effect of Temperature on Meristics	29.5	--	--	--	--	--	8.2	11.6	9.7	--	--
5.	Effect of Environment of Growth Rate	38.8	--	--	--	--	--	6.9	11.6	9.7	10.6	--
6.	Factors influencing Annulus formation	44.5	--	--	--	--	--	--	11.6	9.7	10.6	12.6
7.	Studies of behaviour of larval fish	32.2	--	--	--	--	--	--	--	9.7	10.0	12.5
8.	Effects of Photo period and temperature on Spawning	20.0	--	--	--	--	--	--	--	--	7.5	12.5
	Investigation Total	284.4	--	--	--	27.5	29.8	32.7	46.4	48.5	49.3	50.2

Annual Review				
Laboratory	Regional or Area Office	Washington Office		Date
			Prepared by: D. Miller	8/6/59
			Recommended by:	Date
			Lab. Director Herbert W. Graham	8/6/59
			Reg. or Area Dir. Joseph E. [illegible]	
			Branch Chief [illegible]	12-24-59
			Approved by:	
			Division Chief for Director	

*Total needed by Laboratory for Project in thousands of dollars.

#714 7/9/59

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Laboratory techniques for the culture of marine fish

Investigation Title: Experimental studies

Investigation Chief: ~~Vacant~~ Charles Wheeler

Project Leader: Charles Wheeler F. R. B. GS-11
Name Title Grade

Assistants: (Title and Grade)

David Miller F. R. B. GS-9
Vacant, Student assistant GS-4 (Temporary)

Collaborators:

Need for Information: Standard methods for rearing marine fish under laboratory conditions must be developed as a prerequisite to any further experimental work in this general field.

Objective: To develop and standardize techniques for the holding and rearing of commercial species of marine fish, both young and adult.

Method of Procedure:

Phase 1: Through experimentation, determine the necessary gross requirements of space, circulation, temperature, salinity, oxygen, light, and food, essential to the laboratory culture of fish.
From a knowledge of these requirements, set up standard methods of rearing against which various experimental procedures may be tested.

Phase 2: Assemble a bibliography of the literature on the culture of marine fish larvae.
Publish results.

Exp. Studies - 1
Sheet No. 2 File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 78.4

	FY 1959	FY 1960	FY 1961
Personal Services	--	5.2	3.6
Other Expenses:			
Within Project	--	0.1	0.9
	--	--	--
Lab. Adm. & Ser.	--	8.9	5.8
Lab. Total	--	14.2	10.3
Regional Office		.142	.103
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 60; Phase 2 FY ; Phase 3 FY ; Project FY

Recommended by:

		Date
Originator	C. L. Wheeler	8/6/59
Investigation Chief	C. L. Wheeler	8/6/59
Laboratory Director	Herbert W. Graham	8/6/59
Regional Director	Joseph H. Blanchette	8/19/59
Branch Chief	WHE	12-24-59

Approved by:
Division Chief for Director

Remarks

(Continue on reverse side)

#715 7/9/59

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Rate of ascent of pelagic eggs in waters of known density

Investigation Title: Experimental studies

Investigation Chief: C. L. Wheeler

Project Leader: To be assigned.
Name Title Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: The time interval between the demersal spawning, and the arrival of pelagic eggs at the surface layers is not known for most species. This information is of value in relating large concentrations of eggs at the surface to the actual spawning areas on the bottom.

Objective: To measure the rate of ascent of the newly spawned pelagic eggs of the more important commercial species.

Method of Procedure:

Phase 1: Develop and construct suitable laboratory apparatus for measuring the ascent of pelagic eggs in waters of varying density. Measure the rate of ascent for the eggs of the species for which this information is lacking. Publish the results.

Phase 2:

Exper. Studies - 2
Sheet No. 2

File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 23.7

	FY 1959	FY 1960	FY 1961
Personnel Services	--	4.3	3.0
Other Expenses:			
Within Project	--	0.1	0.9
	--	--	--
Lab. Adm. & Ser.	--	8.9	6.5
Lab. Total	--	13.3	10.4
Regional Office		.133	.104
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 60; Phase 2 FY ; Phase 3 FY ; Project FY 61

Recommended by:

		Date
Originator	C. L. Wheeler	8/6/59
Investigation Chief	C. L. Wheeler	8/6/59
Laboratory Director	Herbert W. Graham	8/6/59
Regional Director	Joseph G. Pennington	8/19/59
Branch Chief	[illegible]	12-24-59

Approved by:

Division Chief for Director

Remarks

(Continue on reverse side)

#715 7/9/59

U. S. Fish and Wildlife Service
Bureau of Commercial Fisheries

Sheet No. 1

Location: Woods Hole, Mass.
Date: August 6, 1959
File No.

Research Project Outline

Title of Project: Determination of sustained swimming rate for larval fish.

Investigation Title: Experimental studies

Investigation Chief: ~~Vacant~~ C. L. Wheeler

Project Leader: To be assigned
Name Title Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: The young of ma ny marine species spend a considerable length of time at the mercy of ocean currents. The time at which they become free of the influence of these currents depends in part upon the rate of development of their swimming ability. Knowledge of the sustained swimming rates for various species would prove valuable in interpreting field observations.

Objective: To determine the net potential for locomotion of larval fish of various ages, and the rate at which this ability increases with increase in age.

Method of Procedure:

Phase 1: Develop new, or adapt existing apparatus for measuring sustained swimming rate of larval fish. Carry out controlled experiments to determine this rate for larvae of varying ages. Compile data and publish results.

Phase 2:

Exp. Studies - 3
Sheet No. 2

File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project 17.3

	FY 1959	FY 1960	FY 1961
Personnel Services	--	--	2.5
Other Expenses:			
Within Project	--	--	0.9
	--	--	--
Lab. Adm. & Ser.	--	--	5.7
Lab. Total	--	--	9.1
Regional Office			.091
Washington Office			
Total			

Recommended Source of Funds S-K and Regular
(S-K, Regular, Contributed, etc.)

Estimated Date of Completion: Phase 1 FY 61; Phase 2 FY ; Phase 3 FY ; Project FY 62

Recommended by:

		Date
Originator	C. L. Wheeler	8/6/59
Investigation Chief	C. L. Wheeler	8/6/59
Laboratory Director	Herbert W. Graham	8/6/59
Regional Director	Joseph F. Penkala	8/19/59
Branch Chief	[illegible]	12-24-59

Approved by:

Division Chief for Director

Remarks

(Continue on reverse side)

#715 7/9/59