

## DOGFISH BIOLOGY--JUSTIFICATION

For more than a century, the spiny dogfish (Squalus acanthias) has been a source of great annoyance and economic loss to the commercial fishermen of New England. At certain times of the year dogfish are so prevalent that it becomes impossible to fish in areas otherwise productive of foodfishes. Dogfish tangle and destroy gill nets and line trawls. They clog the meshes of otter trawls and must be laboriously pulled out by hand. Fishermen are forced to throw individual dogfish over the side, picking them up by hand or with a pitchfork. This results in a loss of fishing time in addition to any loss by damage to the gear.

Dogfish consume herring, mackerel, cod, haddock, and other food fishes, although published reports of their food habits show them to be largely invertebrate feeders. Dogfish often attack and destroy quantities of fish hooked on line trawls.

The dogfish is potentially useful as an industrial fish and the technologists are planning research designed to find ways to handle the fish as both animal food and human food. A minimum of biological research should be done in conjunction with the technological research to round out these studies.

The skates as well are in need of similar study. Two common species already provide a significant poundage to the industrial landings.

Although there is a comparatively great number of scattered reports in the literature on the spiny dogfish, there are few detailed studies of the biology of the species. Most of the reports deal with the extraction, properties of, and Vitamin A content of the liver oil. Bigelow and Schroeder, Fishes of the Western North Atlantic, is concerned mostly with a description of the species, with notes on each phase of its life history. Templeman's 1944 study is the most complete life history study but he admittedly raises questions he is unable to answer. A Russian report briefly describes a method for determining the age of spiny dogfish.

Tagging studies were conducted by Templeman on the East Coast of Canada, and Clemens (and later Holland) on the West Coast of Canada. A limited amount of tagging has been done by the Woods Hole Laboratory.

August 6, 1959

## DOGFISH BIOLOGY--JUSTIFICATION

### List of Projects

1. Abundance and distribution of dogfish
2. Age and growth of dogfish, validation
3. Migrations of dogfish
4. Food habits of dogfish
5. Fecundity of dogfish
6. Abundance and distribution of common skates
7. Age and growth of skates, validation
8. Migration of skates
9. Food habits of skates
10. Collection of biological materials for study

SUMMARY CONTINUED SCHEDULE

Investigation: Dogfish and Skates  
 Biological Laboratory: Woods Hole, Mass.

Project Title	Est.* Cost	Fiscal Years									
		57	58	59	60	61	62	63	64	65	66
1. Abundance and distribution of dogfish	13.9	--	--	--	---	8.5	2.4	3.0	--	--	---
2. Age and growth of dogfish, validation	17.7	--	--	--	--	4.5	2.5	6.3	4.4	--	---
3. Migrations of dogfish	42.4	--	--	--	--	--	6.5	7.0	8.0	10.5	10.4
4. Food Habits of dogfish	22.7	--	--	--	--	--	2.3	2.9	4.1	6.6	6.8
5. Fecundity of dogfish	20.4	--	--	--	--	--	--	2.9	4.1	6.6	6.8
6. Abundance and distribution of common skates	9.2	--	--	--	--	3.9	2.4	2.9	--	--	---
7. Age and growth of skates, validation	15.9	--	--	--	--	--	2.3	6.3	7.3	--	---
8. Migration of skates	44.3	--	--	--	--	--	6.5	7.0	9.5	10.8	10.5
9. Food habits of skates	23.0	--	--	--	--	--	2.2	2.9	4.2	7.0	6.7
10. Collection of biological materials for study	3.6	--	--	--	--	3.6	--	--	--	--	---
Investigation Total	213.1	--	--	--	--	20.5	27.1	41.2	41.6	41.5	41.2
Annual Review		Date									
Laboratory	Regional or Area Office	Washington Office	Prepared by: R. L. Edwards 8/6/59								
			Recommended by: _____ Date _____								
			Lab. Director Herbert W. Graham 8/6/59								
			Reg. or Area Dir. _____								
			Branch Chief <i>Noted HBE 12-24-59.</i>								
			Approved by: _____								
			Division Chief for Director _____								

\*Total needed by Laboratory for project in thousands of dollars.

#714 7/9/59

*Investigation must be delayed pending funds, personnel. Contributions for maintenance of station should not be ignored.*

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: Abundance and distribution of dogfish

Investigation Title: Dogfish and Skates

Investigation Chief: Vacant

Project Leader: Vacant

Name	Title	Grade
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Assistants: (Title and Grade)

Collaborators:

Need for Information: For more than a century, dogfish have been a source of annoyance to commercial fishermen. Dogfish damage nets and seasonally seem to drive foodfish out of commercially fished areas. However, it is not known what size of dogfish population is involved and exactly in what areas these sharks may be found in different seasons of the year. Any program for controlling the dogfish must know how much and where.

Objective: To determine the seasonal abundance and distribution of the dogfish.

Method of Procedure: Examine past and current survey cruise records. Examine records of interviews of commercial fishermen and cruise records of exploratory vessels. Review literature.

Phase 1: Routinely interview commercial vessels in New England ports.

Phase 2: Analyze data and prepare reports for industry journals and SSR. Prepare an annual report for trade.

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project			
	<u>FY 1959</u>	<u>FY 1960</u>	<u>FY 1961</u>
Personal Services	---	---	0.8
Other Expenses:			
Within Project	---	---	0.2
Lab. Adm. & Ser.	---	---	7.5
Lab. Total	---	---	8.5
Regional Office			.085
Washington Office			
Total			

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

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

Recommended by:

Originator	<u>R. L. Edwards</u>	Date	<u>8/6/59</u>
Investigation Chief	<del>R. L. Edwards</del>		<del>8/6/59</del>
Laboratory Director	<u>Herbert E. Graham</u>		<u>8/6/59</u>
Regional Director			
Branch Chief			

Approved by:  
Division Chief for Director \_\_\_\_\_

Remarks

(Continue on reverse side)

*Investigation must be delayed  
pending funds and personnel.  
HHE 12-24-59*

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: Age and growth of spiny dogfish, validation

Investigation Title: Dogfish and skate

Investigation Chief: Vacant

Project Leader: Vacant

Name

Title

Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: The study of the population dynamics of dogfish requires a knowledge of growth rates.

Objective: To determine the growth rates of spiny dogfish.

Method of Procedure:

Phase 1: Collection and evaluation of materials that promise to be useful for ageing.

Phase 2:

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Sheet No. 2

File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs:	Total Needed by Laboratory for Complete Project		
	<u>FY 1959</u>	<u>FY 1960</u>	<u>FY 1961</u>
Personal Services	<u>--</u>	<u>--</u>	<u>0.7</u>
Other Expenses:			
Within Project	<u>--</u>	<u>--</u>	<u>0.2</u>
Lab. Adm. & Ser.	<u>--</u>	<u>--</u>	<u>3.6</u>
Lab. Total	<u>--</u>	<u>--</u>	<u>4.5</u>
Regional Office			<u>.045</u>
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 64

Recommended by:

Originator	<u>R. L. Edwards</u>	<u>8/6/59</u>
Investigation Chief	<u><del>Rodney Edwards</del></u>	
Laboratory Director	<u>Herbert W. Graham</u>	<u>8/6/59</u>
Regional Director		<u>8/19/59</u>
Branch Chief		

Approved by:  
 Division Chief for Director \_\_\_\_\_

Remarks

(Continue on reverse side)

*Investigation must be delayed  
 pending funds + personnel,  
 114E. 12-24-59*

#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: Abundance and distribution of common skates

Investigation Title: Dogfish and skates

Investigation Chief: Vacant

Project Leader: Vacant

Name

Title

Grade

Assistants: (Title and Grade)

Collaborators:

Need for Information: The skates are relatively abundant fishes on the offshore grounds and are continually coming under increasing direct fishing pressure. There are several species involved, about which little or nothing is known.

Objective: To survey the relative abundance and distribution of the several common species of skates, by season, Cape Sable to Cape Hatteras.

Method of Procedure:

Phase 1: Analysis of all available pertinent research vessel data, commercial catch data and plan proper research vessel operations in conjunction with other cruises.

Phase 2:

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File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project			
	FY 1959	FY 1960	FY 1961
Personal Services	--	--	0.5
Other Expenses:			
Within Project	--	--	0.2
Lab. Adm. & Ser.	--	--	3.2
Lab. Total	--	--	3.9
Regional Office			.039
Washington Office			
Total			

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

Estimated Date of Completion: Phase 1 FY 61; Phase 2 FY; Phase 3 FY; Project FY63

Recommended by:		Date
Originator	<u>R. L. Edwards</u>	<u>8/6/59</u>
Investigation Chief	<u>R. L. Edwards</u>	<u>8/6/59</u>
Laboratory Director	<u>Herbert W. Graham</u>	<u>8/6/59</u>
Regional Director	<u>Joseph F. Penner</u>	<u>8/19/59</u>
Branch Chief		
Approved by:		
Division Chief for Director		

Remarks

(Continue on reverse side)

*Investigation must be delayed  
 pending funds + personnel.*

*JHE 12-24-59*

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: Collection of biological material for study of dogfish and skate.

Investigation Title: Dogfish and skate

Investigation Chief: Vacant

Project Leader: Vacant

Name

Title

Grade

Assistants: (Title and Grade)

Collaborators: Port pool personnel and commercial fishermen.

Need for Information: The material is required for research concerned with ageing techniques and proposed fecundity and food studies.

Objective: To obtain required biological material and data for the dogfish-skate investigation.

Method of Procedure:

Phase 1:

Phase 2:

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File No.:

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total Needed by Laboratory for Complete Project			
	<u>FY 1959</u>	<u>FY 1960</u>	<u>FY 1961</u>
Personal Services	<u>--</u>	<u>--</u>	<u>0.5</u>
Other Expenses:			
Within Project	<u>--</u>	<u>--</u>	<u>0.2</u>
Lab. Adm. & Ser.	<u>--</u>	<u>--</u>	<u>2.9</u>
Lab. Total	<u>--</u>	<u>--</u>	<u>3.6</u>
Regional Office			<u>.036</u>
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 63.

Recommended by:		Date
Originator	<u>R. L. Edwards</u>	<u>8/6/59</u>
Investigation Chief	<del>R. L. Edwards</del>	
Laboratory Director	<u>Herbert W. Graham</u>	<u>8/6/59</u>
Regional Director		<u>8/19/59</u>
Branch Chief		
Approved by:		
Division Chief for Director		

Remarks

(Continue on reverse side)

*Investigation must be delayed  
 pending funds & personnel.  
 HHE 12-24-59*

#715 7/9/59