

April 1977

FISHERIES RESEARCH INSTITUTE  
College of Fisheries  
University of Washington  
Seattle, Washington 98195

PUGET SOUND BASELINE PROGRAM  
NEARSHORE FISH SURVEY:  
DATA SUMMARY REPORT

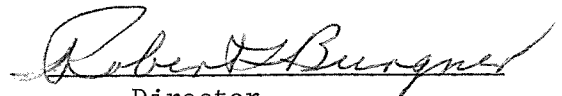
by

Bruce S. Miller, Charles A. Simenstad,  
Lawrence L. Moulton, William A. Karp,  
Kurt L. Fresh, and Frederick C. Funk

FINAL DATA REPORT  
July 1974 - June 1977  
to  
WASHINGTON STATE DEPARTMENT OF ECOLOGY  
Lacey, Washington  
Contract No. 75-017

Approved

Submitted April 27, 1977

  
Director

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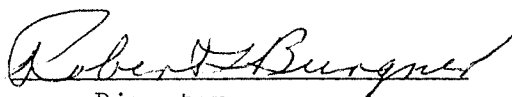
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    - 2. Deadman Bay (gravel)
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    - 1. South Beach (cobble)
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    - 4. Birch Bay (sand/eelgrass)
    - 5. Lummi Bay (mud/eelgrass)

C. Anacortes Area

1. Burrows Island (rocky/kelp bed)
2. Shannon Point (cobble)
3. Guemes South (gravel)
4. Guemes East (sand/eelgrass)
5. Padilla Bay (mud/eelgrass)

V. SCUBA Transects (rocky/kelp bed)

- A. San Juan Island Area--Point George
- B. Cherry Point Area--Barnes Island
- C. Anacortes Area--Allan Island

## I. Introduction

This report accompanies FRI-UW-7109 and contains raw data pertaining to results published in that document. The report is divided into three sections following the sampling methods utilized by the Nearshore Fish Survey: beach seine, townet and SCUBA transect. Sampling methods and site locations are described in FRI-UW-7109.

A data summary table was computed for all hauls taken on a given date at each site. The first column of numbers listed under "SP-STAGE" in the summary table refers to the three digit species codes included as section II of this report. Following the species code is a one digit life history stage code of 1, 2 or 3 for larval, juvenile or adult respectively. Table 1. lists the formulae used in the calculation of the various statistics. All statistics were computed on the mean of species abundance, occurrence, or weight over all hauls in the collection. For the diversity indices, the left column of values was computed on abundance units and the right column of values was computed using biomass units.

Complete copies of all raw data obtained are maintained on file at FRI for reference.

Table 1. Formulae used in the calculation of summary statistics.

$n_i$  refers to the average numbers of species  $i$  present in the collection and  $N$  refers to the averaged total numbers of individuals of all species present.

COEF. VAR	=	$\frac{\text{s.d.}}{\text{mean}}$
Simpson Index	=	$1 - \frac{\sum n_i (n_i - 1)}{n (n - 1)}$
Shannon-Wiener Index	=	$H' = -\sum \frac{n_i}{N} \log_2 \frac{n_i}{N}$
Hill's Ratio	=	$E^{H'} \cdot \frac{\sum n_i^2}{N^2}$
Heip's Evenness Index	=	$\frac{E^{H'} - 1}{S - 1}$

## II. Species Codes used by Nearshore Fish Survey

<u>Scientific name</u>	<u>Common name</u>	<u>Code</u>
<i>Entosphenus tridentatus</i>	Pacific lamprey	1
<i>Lampetra ayresi</i>	river lamprey	2
<i>Squalus acanthias</i>	spiny dogfish	11
<i>Torpedo californica</i>	Pacific electric ray	13
<i>Raja binoculata</i>	big skate	14
<i>Hydrolagus colliei</i>	ratfish	19
<i>Clupea harengus pallasii</i>	Pacific herring	24
<i>Engraulis mordax</i>	northern anchovy	26
<i>Oncorhynchus gorbuscha</i>	pink salmon	27
<i>O. keta</i>	chum salmon	28
<i>O. kisutch</i>	coho salmon	29
<i>O. nerka</i>	sockeye salmon	30
<i>O. tshawytscha</i>	chinook salmon	31
<i>Salmo clarki</i>	cutthroat trout	32
<i>Allosmerus elongatus</i>	whitebait smelt	35
<i>Hypomesus pretiosus</i>	surf smelt	36
<i>Mallotus villosus</i>	capelin	37
<i>Spirinchus thaleichthys</i>	longfin smelt	38
<i>Thaleichthys pacificus</i>	eulachon	39
<i>Stenobranchius leucopsarus</i>	northern lampfish	43
<i>Porichthys notatus</i>	plainfin midshipman	45
<i>Gobiesox maeandricus</i>	northern clingfish	46
<i>Gadus macrocephalus</i>	Pacific cod	47
<i>Microgadus proximus</i>	Pacific tomcod	49
<i>Theragra chalcogramma</i>	walleye pollock	50
<i>Lycodes brevipes</i>	shortfin eelpout	53
<i>L. palearis</i>	wattled eelpout	55
<i>Lycodopsis pacifica</i>	blackbelly eelpout	56
<i>Aulorhynchus flavidus</i>	tube-snout	60
<i>Gasterosteus aculeatus</i>	threespine stickleback	61
<i>Syngnathus griseolineatus</i>	bay pipefish	62
<i>Brachyistius frenatus</i>	kelp perch	66
<i>Cymatogaster aggregata</i>	shiner perch	67

II, Species Codes, cont'd

<u>Scientific name</u>	<u>Common name</u>	<u>Code</u>
<i>Embiotoca lateralis</i>	striped seaperch	68
<i>Rhacochilus vacca</i>	pile perch	71
<i>Trichodon trichodon</i>	Pacific sandfish	73
<i>Anoplarchus purpurescens</i>	high cockscomb	76
<i>Lumpenus maculatus</i>	daubed shanny	79
<i>L. sagitta</i>	snake prickleback	80
<i>Phytichthys chirus</i>	ribbon prickleback	81
<i>Plectobranchus evides</i>	bluebarred prickleback	82
<i>Poroclinus rothrocki</i>	whitebarred prickleback	83
<i>Apodichthys flavidus</i>	penpoint gunnel	86
<i>Pholis clemensi</i>	longfin gunnel	87
<i>P. laeta</i>	crescent gunnel	88
<i>P. ornata</i>	saddleback gunnel	89
<i>Lyconectes aleutensis</i>	dwarf wrymouth	95
<i>Ammodytes hexapterus</i>	Pacific sand lance	97
<i>Clevelandia ios</i>	arrow goby	98
<i>Lepidogobius lepidus</i>	bay goby	100
<i>Sebastes auriculatus</i>	brown rockfish	108
<i>S. caurinus</i>	copper rockfish	110
<i>S. flavidus</i>	yellowtail rockfish	115
<i>S. maliger</i>	quillback rockfish	116
<i>S. melanops</i>	black rockfish	117
<i>Hexagrammos decagrammus</i>	kelp greenling	131
<i>H. stelleri</i>	whitespotted greenling	133
<i>Ophiodon elongatus</i>	lingcod	134
<i>Artedius fenestralis</i>	padded sculpin	137
<i>A. harringtoni</i>	scalyhead sculpin	138
<i>A. lateralis</i>	smoothhead sculpin	139
<i>Ascelichthys rhodorus</i>	rosylip sculpin	142
<i>Blepsias cirrhosus</i>	silverspotted sculpin	143
<i>Clinocottus acuticeps</i>	sharpnose sculpin	145
<i>Enophrys bison</i>	buffalo sculpin	149
<i>Gilbertidia sigalutes</i>	soft sculpin	150

II, Species Codes, cont'd

<u>Scientific name</u>	<u>Common name</u>	<u>Code</u>
<i>Hemilepidotus hemilepidotus</i>	red Irish lord	151
<i>Leptocottus armatus</i>	Pacific staghorn sculpin	158
<i>Myoxocephalus polyacanthocephalus</i>	great sculpin	160
<i>Nautichthys oculofasciatus</i>	sailfin sculpin	161
<i>Oligocottus maculosus</i>	tidepool sculpin	162
<i>O. rimensis</i>	saddleback sculpin	163
<i>Radulinus boleoides</i>	darter sculpin	167
<i>Rhamphocottus richardsoni</i>	grunt sculpin	168
<i>Scorpaenichthys marmoratus</i>	cabezon	169
<i>Synchirus gilli</i>	manacled sculpin	170
<i>Agonopsis emmelane</i>	northern spearnose poacher	173
<i>Agonus acipenserinus</i>	sturgeon poacher	174
<i>Anoplagonus inermis</i>	smooth alligatorfish	175
<i>Odontopyxis trispinosa</i>	pygmy poacher	182
<i>Pallasina barbata</i>	tubenose poacher	183
<i>Xeneretmus latifrons</i>	blacktip poacher	184
<i>X. triacanthus</i>	bluespotted poacher	185
<i>Eumicrotremus orbis</i>	Pacific spiny lumpsucker	187
<i>Liparis callydon</i>	spotted snailfish	188
<i>L. cyclopus</i>	ribbon snailfish	189
<i>L. florae</i>	tidepool snailfish	191
<i>L. fucensis</i>	slipskin snailfish	192
<i>L. pulchellus</i>	showy snailfish	193
<i>Citharichthys stigmaeus</i>	speckled sanddab	197
<i>Isopsetta isolepis</i>	butter sole	203
<i>Lepidopsetta bilineata</i>	rock sole	204
<i>Microstomus pacificus</i>	Dover sole	206
<i>Parophrys vetulus</i>	English sole	207
<i>Platichthys stellatus</i>	starry flounder	208
<i>Pleuronichthys coenosus</i>	C-0 sole	209
<i>Psettichthys melanostictus</i>	sand sole	210
<i>Liparis rutteri</i>	ringtail snailfish	212
<i>L. mucosus</i>	slimy snailfish	213

II, Species Codes, cont'd

<u>Scientific name</u>	<u>Common name</u>	<u>Code</u>
<i>Oncorhynchus</i> sp.	salmon	338
Osmeridae	smelt	431
Gadidae	codfishes	359
Bathymasteridae	ronquils	398
Stichaeidae	pricklebacks	400
<i>Anoplarchus</i> sp.	cockscombs	401
Pholidae	gunnels	408
Gobiidae	gobies	423
Scorpaenidae	rockfishes	436
<i>Sebastes</i> sp.	rockfishes	437
Hexagrammidae	greenlings	441
Cottidae	sculpins	446
<i>Scorpaenichthys</i> sp.	cabazon	466
Agonidae	poachers	469
<i>Asterotheca</i> sp.	starsnouts	473
<i>Xeneretmus</i> sp.	poachers	479
Cyclopteridae	lumpfishes and snailfishes	480
<i>Careproctus</i> sp.		481
<i>Liparis</i> sp.	snailfishes	483
<i>Nectoliparis</i> sp.	snailfishes	484
Pleuronectidae	righteye flounder	488

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