IDENTIFICATION AND DISTRIBUTION OF FISH AND SHELLFISH IN TILLAMOOK BAY, OREGON

ANNUAL REPORT

February 1, 1974 to June 30, 1974

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Fish Commission of Oregon

Groundfish & Shrimp -

In Cooperation With
Bureau of Sportfisheries and Wildlife
Fish and Wildlife Service
U.S. Department of Interior

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INTRODUCTION

Tillamook Bay is a relatively undeveloped bay, but has under-gone much change due to sedimentation. The bay is now being planned by a local task force and may face further changes. Many resource agencies will be called upon to make decisions concerning the fisheries of the bay. Since these decisions can best be based on sound biological information, the Fish Commission of Oregon, in cooperation with the U.S. Bureau of Sportfisheries and Wildlife, set out to determine which fish and shellfish are found in Tillamook Bay, and their distribution over an annual period.

A cooperative program was initiated with the Oceanography Department at Oregon State University. The program personnel will investigate the abundance of plankton in Tillamook Bay and the incidence of plankton in the stomachs of juvenile salmon.

This report is a summary of the work accomplished and the data collected for the first five months of the project (February 1 - June 30, 1974).

METHODS

Site Selection

The sampling sites were selected to sample the estuary as a unit. The sample sites were weighted somewhat to the lower half of the bay because the salinity change is greatest here and therefore should contain the greatest diversity of species. Diverse habitats were located by aerial photographs. These habitats include shallow water, deep water, eel grass beds, sand flats, mud flats, and river channels. These sites were to be sampled at both high and low tides for changes in fish distribution and salinity.

Biological Sampling

Two principle pieces of gear were used, a try net (small trawl) and a 150 foot beach seine. This gear was worked from a 20 foot Harvey dory with two 50 horse power outboards. A tow bit and warp reel were added to the boat to facilitate gear handling.

Variable mesh gill nets and scuba gear were also used to catch and observe different species.

Physical Parameters

Along with the various species recorded at each station, some physical data were recorded to better understand their distribution. Among the parameters recorded were salinity, temperatures, bottom type, and vegetation.

PROGRESS

Stations and Gear

The names and locations of the stations are given in Figure 1. A total of 164 samples have been completed. These can be broken down in 128 trawl samples, 30 seine samples, and 6 gill net samples.

The seine and trawl seem to be about equal in the number of different species caught, with 33 different species being caught by the trawl and 29 species by the seine. Only one species was caught by the gill net and two species were observed while diving. The latter two methods have only been used intermittently.

With good weather and adequate manpower, 9 to 11 stations were completed per tide and the time per station has been running from 15 to 20 minutes.

Fish

The names and locations of fish caught during May and June are given in Table 1. The station locations are arranged somewhat in order from the mouth of the estuary to the rivers. The species listed are summarized regardless of month, tidal stage, life stage, abundance, or gear.

A total of 40 species have been caught. Most of these species were known to occur in Tillamook Bay while some have been recorded in Tillamook Bay for the first time (Table 1). Other species known to occur in the bay have not been observed to date in this study.

It appears that the lower bay may be more productive in the number of species present, although this may be because of the greater effort with the beach seine in the lower bay. Some species are cosmopolitan in their distribution in Tillamook Bay and others seem to have restricted distribution.

Shellfish

The most predominant crustaceans are also included in Table 1. These are the Dungeness crab and sand shrimp. They are both important because of their wide distribution and abundance, but only the Dungeness crab is of direct economic importance.

Other shellfish have been caught such as hermit crabs, shore crabs, snails, and broken-back shrimp but have not been thoroughly identified yet. Analysis of our sampling indicates their distribution is very limited.

Bottom Types and Vegetation

Bottom materials have included mud, sand, rocks, shells, and wood debris. The bay generally changes from sand to muddy sand to mud from the lower bay to the upper flats. The rocky bottoms have occurred in the lower channel areas and the shell and wood debris are interspersed throughout the bay.

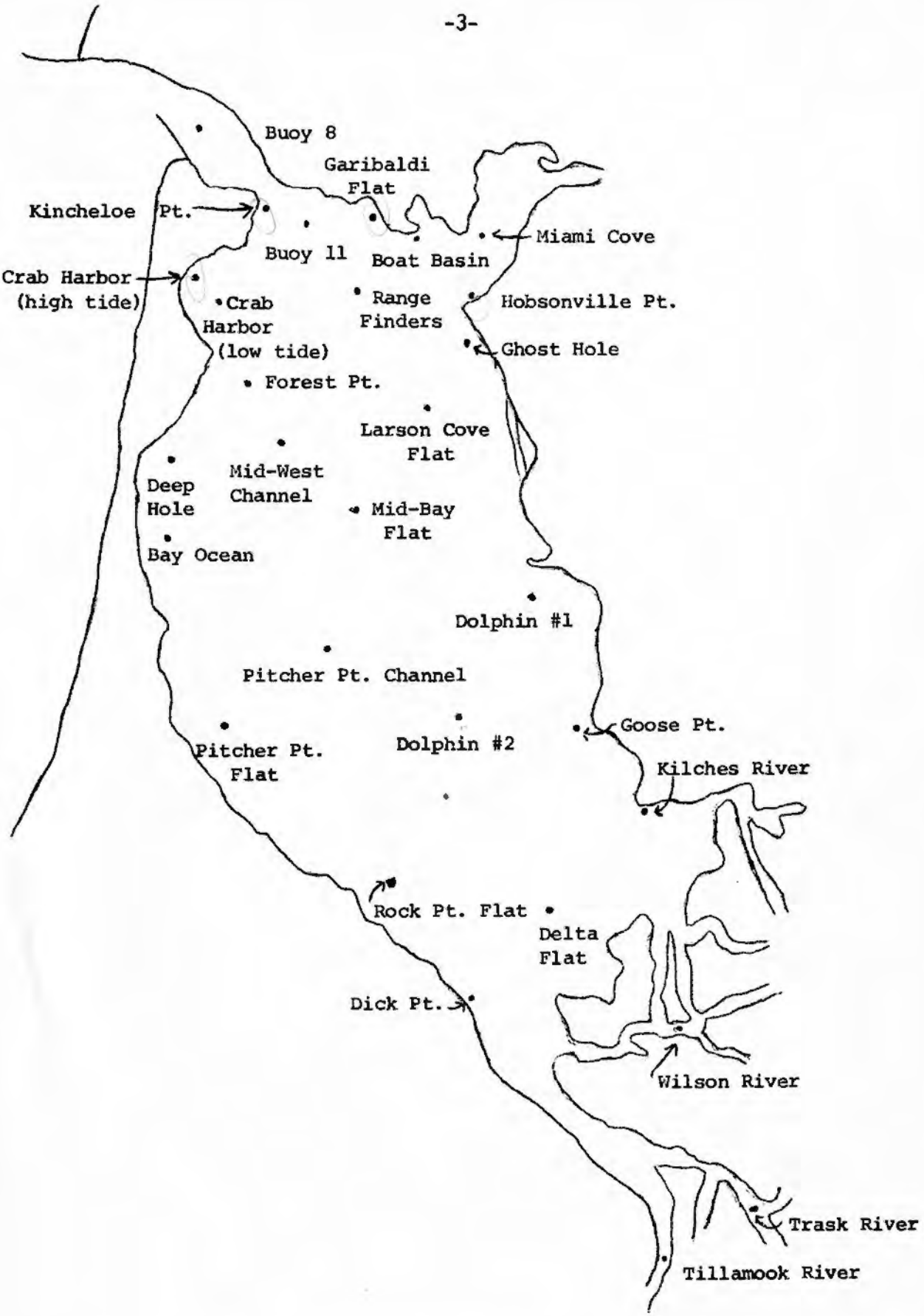

Figure 1. Sampling Station Names and Locations in Tillamook Bay, Oregon.

Table 1. Names and Locations of Fish and Shellfish Caught in Tillamook Bay by Station.

Species		Station																												
		Buoy 8	Kincheloe Pt.	Buoy 11	Garibaldi Flat	Boat Basin	Miami Cove	Crab Harbor	Range Finders	Hobsonville Pt.	Ghost Hole	Forest Pt.	Deep Hole	Midwest Channel	Larson Cove Flat	Midbay Flat	Bay Ocean	Dolphin #1	Pitcher Pt. Channel	Dolphin #2	Goose Pt.	Kilchis River	Pitcher Pt. Flat	Rocky Pt. Flat	Delta Flat	Dick Pt.	Wilson River	Trask River	Tillamook River
American Shad (*Alosa sapidissima*)			X		X			X																						
Pacific Herring (*Clupea harengus*)		X	X		X	X	X	X		X													X							
Northern Anchovy (*Engraulis mordax*)										X																				
Chum Salmon (*Oncorhynchus keta*)			X		X			X		X							X													
Coho Salmon (*O. kisutch*)			X					X																	X					
Chinook Salmon (*O. tshawytscha*)					X					X	X																			
Cutthroat Trout (*Salmo clarki*)			X							X																				
Rainbow/Steelhead (*S. gairdneri*)			X		X					X																				
Surf Smelt (*Hypomesus pretiosus*)			X		X			X		X			X			X	X	X												
Top Smelt (*Atherinops affinis*)								X																						
Pacific Tomcod (*Microgadus proximus*)						X							X																	
Tube-snout (*Aulorhynchus flavidus*)										X			X		X		X													
Threespine Stickleback (*Gasterosteus aculeatus*)					X					X						X	X						X							
Bay Pipefish (*Syngnathus griseolineatus*)							X			X					X	X	X		X				X							
Shiner Perch (*Cymatogaster aggregata*)		X	X	X	X	X.		X		X	X			X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
Striped Seaperch (*Embiotoca lateralis*)			X																											
Snake Prickleback (*Lumpenus sagitta*)																X														
High Cockscomb Prickleback (*Anoplarchus purpurescens*)	*									X																				
Saddleback Gunnel (*Pholis ornata*)		X	X	X	X		X		X	X	X		X		X	X	X	X	X	X	X	X	X		X	X				
Penpoint Gunnel (*Apodichthys flavidus*)			X		X					X																				
Red Gunnel (*Pholis schultzi*)	*																	X		X										
Wolf-eel (*Anarrhichthys ocellatus*)		X																												
Pacific Sand Lance (*Ammodytes hexapterus*)								X		X																				
Rockfish (*Sebastes Sp.*)			X		X					X			X																	
Lingcod (*Ophiodon elongatus*)						X									X															
Kelp Greenling (*Hexagrammos decagrammus*)			X		X					X	X																			
Rock Greenling (*H. lagocephalus*)			X		X																									
Padded Sculpin (*Artedius fenestralis*)		X		X									X													X	X	X		
Buffalo Sculpin (*Enophrys bison*)		X	X	X		X	X	X			X	X														X				

Table 1. (Continued)

Species		Station																												
		Buoy 8	Kincheloe Pt.	Buoy 11	Garibaldi Flat	Boat Basin	Miami Cove	Crab Harbor	Range Finders	Hobsonville Pt.	Ghost Hole	Forest Pt.	Deep Hole	Midwest Channel	Larson Cove Flat	Midbay Flat	Bay Ocean	Dolphin #1	Pitcher Pt. Channel	Dolphin #2	Goose Pt.	Kilchis River	Pitcher Pt. Flat	Rocky Pt. Flat	Delta Flat	Dick Pt.	Wilson River	Trask River	Tillamook River
Pacific Staghorn Sculpin (*Leptocottus armatus*)		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Cabezon (*Scorpaenichthys marmoratus*)			X		X					X	X		X																
Red Irish Lord (*Hemilepidotus hemilepidotus*)			X								X																		
Prickly Sculpin (*Cottus asper*)																												X	
Tidepool Sculpin (*Oligocottus maculosis*)	*									X																			
English Sole (*Parophrys vetulus*)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X				
Sand Sole (*Psettichthys melanostictus*)				X	X			X	X			X	X	X					X										
Starry Flounder (*Platichthys stellatus*)			X		X	X	X	X	X	X	X	X	X			X	X	X		X	X	X	X	X	X	X	X	X	X
Pacific Sanddab (*Citharichthys sordidus*)	*			X		X																							
Ringtail Snailfish (*Ciparis rutteri*)	*	X																											
Warty Poacher (*Occella verrucosa*)	*	X																											
Dungeness Crab (*Cancer magister*)		X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X					
Sand Shrimp (*Crangon sp.*)		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			

* First record for Tillamook Bay

Vegetation has included eel grass beds throughout the bay and several algaes in the lower bay.

No pattern of fish distribution with bottom type or vegetation has yet been apparent. That relationship will take further analysis.

FUTURE ANALYSIS

In the final report, the major contribution will be the monthly distribution of fish in Tillamook Bay, along with some of their life stages. Other analysis will include the species associated with certain bottom types and with different salinities.