REPORT OF THE TECHNICAL SUB-COMMITTEE OF THE INTERNATIONAL TRAWL FISHERY COMMITTEE

Appointed By

The Second Conference On Coordination Of Fisheries Regulations Between

CANADA

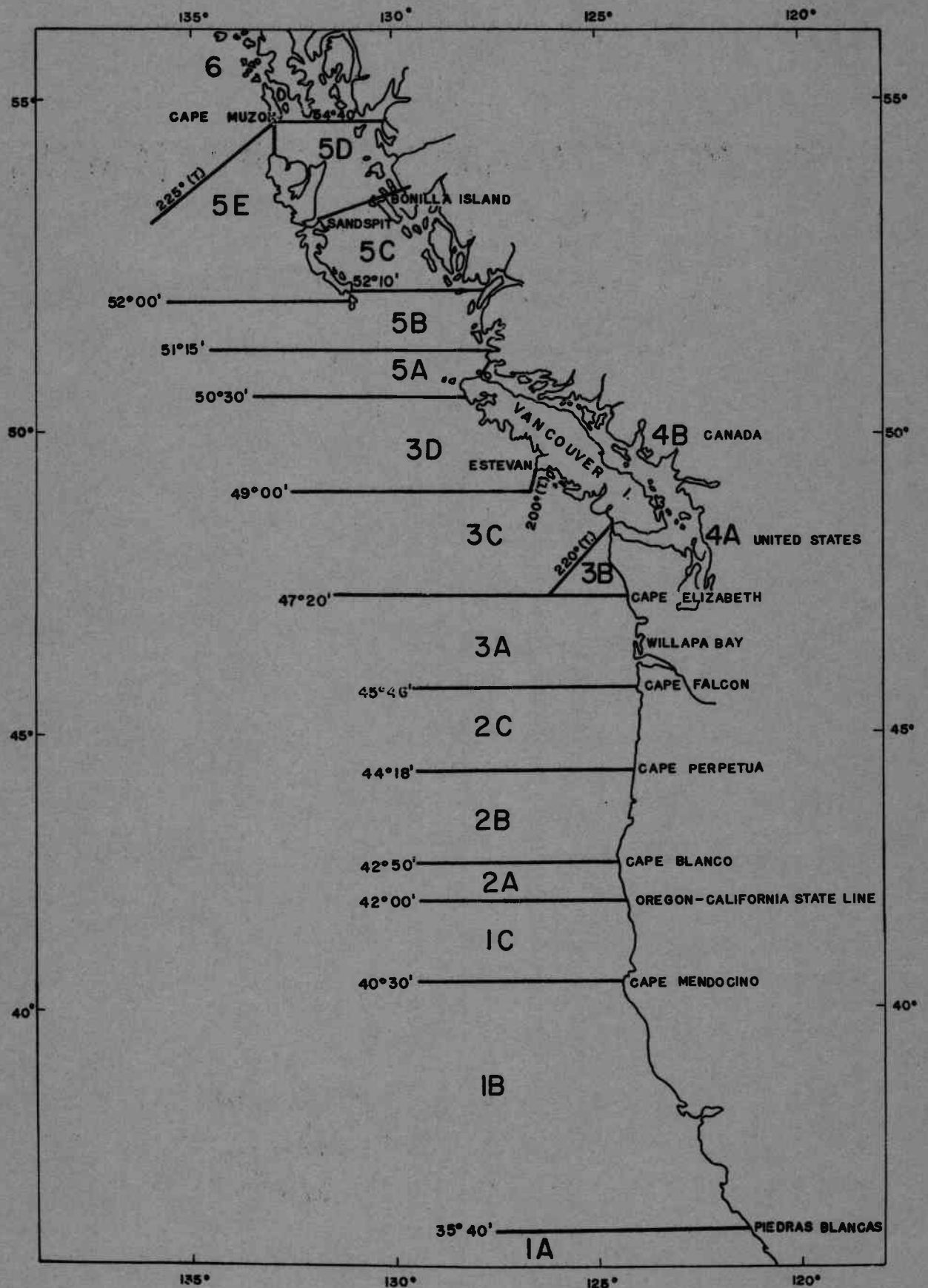
and the

UNITED STATES

MINUTES OF THE TENTH ANNUAL MEETING

JUNE 17-19, 1969

SEATTLE, WASHINGTON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CAPE ELIZABETH
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WILLAPA BAY
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CAPE FALCON
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CAPE PERPETUA
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42°50'
CAPE BLANCO
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OREGON-CALIFORNIA STATE LINE
1C
40°30'
CAPE MENDOCINO
1B
35°40'
PIEDRAS BLANCAS
1A

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Minutes of the Tenth Annual Meeting
June 17-19, 1969
Seattle, Washington

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Report of the Technical Sub-Committee of the International Trawl Fishery Committee appointed by the Second Conference on Coordination of Fisheries Regulations between Canada and the United States

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DATE: June 17-19, 1969

PLACE: Seattle, Washington

PARTICIPANTS: CANADA - C. R. Forrester - Chairman
R. D. Humphreys
M. P. Houghton (observer)
M. P. Shepard (observer)

UNITED STATES

California	-	T. Jow
Oregon	-	J. M. Meehan
Washington	-	D. E. Kauffman G. S. DiDonato J. Reeves (observer) B. Pattie (observer) N. Pasquale (observer) A. Millikan (observer) J. Beam (observer)
PMFC	-	L. A. Verhoeven (observer)
IPHC	-	E. A. Best (observer) S. H. Hoag (observer)
USBCF	-	H. A. Larkins (observer)

I. CALL TO ORDER

The tenth annual meeting of the Technical Sub-Committee was called to order at 10:00 AM on June 17 by Chairman C. R. Forrester under instructions set forth by the parent committee in 1959. The business of the meeting was guided by a prepared agenda (Appendix A).

II. APPOINTMENT OF SECRETARY

R. D. Humphreys of Canada was appointed to act as recording secretary for the meeting.

III. APPROVAL OF AGENDA

Minor amendments were made to the tentative agenda as circulated prior to the meeting and the agenda was approved as amended.

IV. STATUS REPORTS

1. Total Catch and Effort for the 1968 Trawl Fishery

The 1968 otter trawl catch by Canadian and United States fishermen from the northeastern Pacific was 151 million lbs (Table 1). Although down from the 1967 catch of 168 million lbs and considerably lower than the record catch of 185 million lbs in 1966, the catch exceeded the 10-year mean (1958-67) of 145 million lbs. Total effort of 150,066 hours was an increase of 1.7% over the 147,488 hours expended in 1967.

In British Columbia, the total catch at 40 million lbs increased almost in direct proportion to the increase in the amount of effort expended. Pacific cod, with landings at 14.8 million lbs in 1968 continued to be the main species caught. There was a marked increase in landings of Pacific ocean perch which, at 1.9 million lbs, was 55% greater than in 1967 but less than half that taken in 1966. The bulk (83%) of the Pacific ocean perch catch was taken from grounds in Queen Charlotte Sound. Total catch of trawl-caught lingcod, at 6.4 million lbs, was the highest ever landed by the trawl fleet and was taken primarily from grounds off the west coast of Vancouver Island (Areas 3C and 3D).

Washington trawl landings, at 56 million lbs, decreased 28% from the record high 1967 production. This large decline in landed weight can be attributed to the failure of the reduction fishery for coastal hake to develop during the summer of 1968, due primarily to economic conditions. Major foodfish species landed were Pacific ocean perch, other rockfish, lingcod, Pacific cod,

Table 1. Otter trawl landings from the northeastern Pacific by Canadian and United States vessels in 1967, 1968, and mean for 1958-67 in thousands of pounds.

	Mean 1958-67	1967					1968				
		B.C.	Wash.	Ore.	Calif.	Total	B.C.	Wash.	Ore.	Calif.	Total
English sole	14,280	1,448	2,915	2,304	5,824	12,491	1,849	3,169	2,360	5,810	13,188
Rock sole	4,750	5,697	1,879	8	-	7,584	6,744	826	51	3	7,624
Petrale sole	8,530	1,040	1,830	1,771	2,770	7,411	813	1,575	1,653	2,943	6,984
Dover sole	15,620	192	998	3,565	7,212	11,967	231	1,526	4,325	8,526	14,608
Rex sole	2,590	42	129	1,219	1,762	3,152	19	19	1,075	1,929	3,042
Starry flounder	2,270	239	1,271	277	788	2,575	156	1,957	454	811	3,378
Other flatfish	1,900	777	166	245	1,371	2,559	429	48	215	1,229	1,921
Pacific cod	20,620	14,552	8,365	430	-	23,347	14,840	5,526	385	-	20,751
Lingcod	8,600	4,159	5,778	1,067	737	11,741	6,435	5,940	1,526	923	14,824
Sablefish	2,770	306	182	67	1,398	1,953	369	155	56	1,418	1,998
Pac. ocean perch	17,650	863	13,579	1,600	18	16,060	1,932	11,715	1,649	23	15,319
Other rockfish	21,700	500	6,863	4,061	8,149	19,573	719	10,255	4,253	7,841	23,068
Misc. species	1,200	521	86	7	429	1,043	426	80	31	365	902
Dogfish	2,010	124	-	-	3	127	65	-	2	-	67
Animal food	17,110	6,511	6,829	3,999	2,592	19,931	4,996	6,310	2,815	2,590	16,711
Reduction[1]	6,860	-	26,819	18	-	26,837	-	6,865	49	-	6,914
Total	145,240	36,971	77,689	20,638	33,053	168,351	40,023	55,966	20,899	34,411	151,299
% of Total Catch	-	22.0	46.1	12.3	19.6	100.0	26.5	37.0	13.8	22.7	100.0
Total Hours	NA[2]	26,483	49,700	20,183	51,089	147,488	29,352	46,083	24,456	50,175	150,066
Catch/hr - lb	NA	1,396	1,563	1,023	647	1,150	1,364	1,214	855	686	1,008

[1]Reduction pounds includes dogfish in Washington statistics.

[2]Not available due to incomplete data for some years.

English sole and starry flounder. The major species contributing to the animal food landings were Pacific hake and English sole.

Trawl landings in Oregon, at 21 million lbs, remained at a low level in 1968 although total effort expended was 21.2% more than in 1967. There was an increase in the landings of Dover sole of 0.8 million lbs and a marked increase in the landings of lingcod which, at 1.5 million lbs, was 43.0% more than in 1967. Major species landed were Dover sole, rockfish, English sole, petrale sole, and Pacific ocean perch.

There was little change in California trawl production in 1968 and total catch was 34 million lbs. This catch exceeded the 1967 and 10-year mean catches by 4% and 2%, respectively. Landings from Area 1C exceeded those from Area 1B for the first time due mainly to an influx of vessels from other ports into the northern California fleet. The predominant species in the 1968 catch were Dover sole, rockfish, English sole and petrale sole.

2. Petrale Sole

a. Catch per Effort

The United States and Canada landed a total of 7.0 million lbs of petrale sole in 1968, a decrease of 0.4 million lbs or 6% from 1967 and 18% below the 10-year mean of 8.5 million lbs.

Canada. Landings of petrale sole from the northern and southern stocks by Canadian fishermen totalled 811,500 lbs in 1968; a decrease of 22% from the 1967 landings and 23% from the 10-year mean (1958-67). The Canadian catch from the southern stock off the lower west coast of Vancouver Island was 249,500 lbs, 6% less than in 1967 and a decrease of 29% from the mean of the preceding 10 years. Average catch per effort was about the same as in 1967

(67 lb/hr in 1968) - less than half the mean for the previous 10 years. Northern stock landings at 562,000 lbs were about 27% lower than in 1966.

Washington. The trawl catch of petrale sole in 1968 was 1.6 million lbs; down 14% from 1967 and 40% below the mean for 1958-67. The low level of production occurred in spite of the removal of winter landing restrictions on petrale sole which had been in effect since 1955. Southern stock catches from PMFC Area 3C were 512,000 lbs - virtually the same as in 1967, which was about 60% less than the 1958-67 mean. Peak production from the summer fisheries on the inshore banks of Area 3C occurred between 1959 and 1961 and has declined since then - sharply in 1967 and remaining at a low level during 1968. Northern stock catches decreased 14% from 1967; a decline occurring in catch and catch per effort for the summer fisheries for petrale sole in Queen Charlotte Sound and Hecate Strait.

Oregon. A total catch of 1.7 million lbs of petrale sole was landed at Oregon ports in 1968. Only one landing of 1,000 lbs came from the southern stocks off the lower west coast of Vancouver Island (Area 3C). Catch/effort for Area 3D for the catch of 44,000 was 186 lb/hr. For Areas 1C-3A where the balance of the catch was taken, catch/effort was 216 lb/hr - a 16.0% decrease from the 1967 level of 257 lb/hr.

California. The 1968 catch of 2.9 million lbs, taken largely in Areas 1C and 1B, was 6% above that of 1967 and 1% above the 10-year average. California petrale sole landings have fluctuated between 2.5 and 3.4 million lbs with an average of 2.9 million lbs during the past 10 years.

b. Definition of Stocks

Recoveries of petrale sole tagged during February 1962 in the Willapa

Deep (Area 2D-3A) in 180-230 fathoms indicate a movement inshore over the continental shelf waters of the Washington coast and northward along the west coast of Vancouver Island during the spring, summer and fall months. The presence of Willapa Deep petrale sole on the inshore banks of Area 3C suggests that the winter and summer fisheries off the Washington coast must be considered in the attempt to ascertain reasons for the decline in catch which has occurred in Area 3C.

Four major petrale sole spawning deeps off California have been identified as Point Sal (1A), Point Montara (1B), Point Delgada (1B) and Eel River Canyon (1C). Available evidence supports the designation of these four aggregations of fish as stocks for which data can be organized for assessments.

c. Winter Fishery

Washington petrale sole landings from all areas during the 1968-69 winter fishery (December-April inclusive) totalled 1,042,000 lbs. This catch was of the same magnitude as the 1967-68 catch which was the first following the rescinding of the petrale sole landing restriction in Washington. The distribution of catch in each year is shown in Table 2. Oregon fisherman landed 343,000 lbs, which was 12.5% less than the 1967-68 winter catch. During November and December 1968, California landed 299,000 lbs. Canada had no winter fishery for petrale sole in 1968-69.

d. Summary

The recent decline in petrale sole landings and fishing success off British Columbia by United States and Canadian trawlers appears to reflect a significant decrease in the abundance of this species. The lifting of winter landing restrictions in Washington has not resulted in the development of any

Table 2. Washington catches of petrale sole during the winter fishery.

DEC-APR	Esteban Deep		Cape Flattery Spit	
	lb	lb/hr		lb/hr
1967-68	615,000	650	231,000	420
1968-69*	385,000	710	523,000	660

*1968-69 figures are preliminary.

large-scale fishery although a moderate increase in the landings during this time period has occurred.

There is evidence to indicate exploitation of this species is occurring by Soviet and Japanese trawlers, however, the Sub-Committee does not have available foreign fishery catch statistics in the detail necessary to adequately assess this point. (One Soviet and three Japanese recoveries of petrale sole tagged by the Washington State Department of Fisheries were returned this past year.)

There is also a suggestion that in recent years environmental conditions have been such that recruitment of young fish into the fishery in the immediate future will not result in stock levels much above those existing at the present time.

3. Lingcod

a. Catch per Effort (Area 3C)

Total lingcod production from all areas increased in 1968 to 14.8 million lbs landed; an increase of 26% over the catch of 11.7 million lbs in 1967.

Canada. Total Canadian trawl catch of lingcod in 1968 was the highest on record at 6.4 million lbs; an increase of 55% from 1967 and over twice the mean catch for the 1958-67 period. Almost 60% of the catch came from grounds off the west coast of Vancouver Island. The trawl catch of lingcod from Area 3C was 88% greater than the mean for the previous 10 years. Catch/effort in Area 3C in 1968 was 80% higher than the 10-year mean (1958-67).

Washington. The 1968 Washington trawl landings of lingcod continued at the record high level of production which began in 1966. A total of 5.9

million lbs was landed and this exceeded the 1958-67 mean of 4.2 million lbs by 43.0%. The high catches occurring since 1966 have been achieved by increased landings from the Queen Charlotte Sound area by Washington trawl fishermen. The lingcod catch and amount of fishing effort expended each summer on the Forty-Mile Bank is affected by the schools of dogfish found on the grounds. Catch/effort in 1968 was 1,100 lb/hr. On the Swiftsure grounds there is little effort because of the threat of loading nets with dogfish.

Oregon. The total lingcod catch in 1968 by Oregon fishermen was 1.5 million lbs, which was an increase of 43.0% over the 1967 landings and over twice the 1958-67 mean catch of 0.7 million lbs. Over 70% of the catch came from Areas 2C, 3A and 3B.

California. The catch of lingcod by California was 923,000 lbs; up 20% from the 1967 level and 2% above the 10-year mean.

b. Stocks in Area 3C

Examination of statistics of catch and records from tagging experiments conducted on lingcod in Area 3C suggest:

i. the presence of a number of apparently discrete populations within the area,

ii. that fisheries conducted by Canadian and United States fishermen are not always being conducted on the same populations.

4. Pacific Cod

a. Catch/Effort (Areas 3C, 5D)

Pacific cod landings by United States and Canadian trawlers dropped slightly in 1968 to 20.8 million lbs compared to 23.3 million in 1967. Failure

to develop an intensive fishing effort in Hecate Strait by Washington fishermen coupled with a sharp drop in catches from Queen Charlotte Sound were the major causes of the decreased landings, though there is also some evidence of decreased recruitment. The catch was just slightly above the 10-year mean of 20.6 million lbs.

Canada. Pacific cod was again the dominant species landed by Canadian fishermen at 14.8 million lbs in 1968. The catch was about the same as in 1967, but was 17% above the mean catch for the 1958-67 period. Data suggest limited recruitment to the fishery since the strong 1962 year-class which was mainly responsible for sustaining the cod fishery during the years 1965-67.

Washington. Trawl landings of Pacific cod by Washington fishermen declined in 1968 to 5.5 million lbs; down 34% from 1967 and 28% from the 1958-67 mean. Intensive fishing effort in Hecate Strait did not develop and the fishery in Queen Charlotte Sound was down sharply especially on the Goose Island grounds. The Area 3C Pacific cod landings in 1968 came primarily from waters off Ucluelet during February, March, and April.

Oregon. Cod landings in 1968 were 385,000 lbs; down 10.5% from 1967 but 43.7% above the 1958-67 mean. Pacific cod continues to be an incidental species in Oregon.

California. No Pacific cod were caught off California in 1968.

5. Pacific Ocean Perch

a. Catch/Effort (Areas 3B to 5B)

There was a slight decline in catch of Pacific ocean perch to 15.3 million lbs in 1968 from 16 million lbs in 1967 and down from the 1958-67 mean

by 13%. Catch statistics and information on fishing patterns suggest that stocks of Pacific ocean perch are much reduced when compared with previous years. Fishing effort on Pacific ocean perch is moving progressively northward as stocks off Oregon and Washington become further reduced.

Canada. British Columbia trawlers landed 1.9 million lbs of Pacific ocean perch in 1968 which was over twice the amount landed in 1967 and about 32% greater than the 1958-67 mean. The bulk of the catch was taken, as usual, in Queen Charlotte Sound (Areas 5A and 5B). The catch/effort in 1968 was 2,117 lb/hr, which was an increase of about 7% from 1967. However, more time is now spent on searching for perch schools so catch/effort is probably artificially high.

Washington. Pacific ocean perch landings declined in 1968 to 11.7 million lbs; down 13.7% from 1967 but still 10.4% above the 1958-67 mean. However, the mean includes landings during the late 1950's at which time the fishery was still developing at a level far below its potential. During the past five years, the Washington trawl fishery for Pacific ocean perch has shifted northward into Queen Charlotte Sound. This movement was accelerated in 1967 as a result of severe competition from USSR fishing fleets working perch grounds off the northern Washington coast, and lower west coast of Vancouver Island beginning in 1966. Based on catch and effort records from the Washington trawl fleet, it appears that the Pacific ocean perch populations along the northern Washington coast and west coast of Vancouver Island have been considerably diminished as a result of both domestic and foreign fisheries.

Oregon. Landings of Pacific ocean perch in 1968 totalled 1.6 million lbs; about the same as the 1967 landing and 70.2% below the 10-year mean. The bulk of the catch came from Queen Charlotte Sound.

California. Pacific ocean perch is an incidental species in California landings. Total landings of Pacific ocean perch by California fishermen were 23,000 lbs from Area 1C.

6. English Sole

The coastal catch of English sole by Canadian and United States fishermen rose in 1968 to 13.2 million lbs; up 5.6% over the 1967 total but still below the 1958-67 mean catch by about 1 million lbs.

Canada. The English sole fishery was at a low level in northern Hecate Strait in 1968. British Columbia fishermen landed a total of 1.8 million lbs of English sole - a catch incidental to that of other species.

Washington. Trawl landings of English sole in 1968 amounted to 3.2 million lbs; up slightly from the 2.9 million lbs landed in 1967 but still 19.4% below the 10-year mean of 3.9 million lbs. Production occurred in two major areas - the northern Washington coast (Area 3B) and Puget Sound (Area 4A).

Oregon. English sole landings were 2.4 million lbs in 1968; up 2.4% from the 1967 total and 13.2% above the 10-year mean. Catch/effort for 1968 was 292 lb/hr which was 6.1% below the 1967 figure of 311 lb/hr.

California. The 1968 catch of 5.8 million lbs of English sole was virtually identical to the 1967 catch, but exceeded the 10-year average of 4.4 million lbs by 24%. The Area 1C catch increased 18% over the 1967 catch while decreases were noted for other areas.

7. Dover Sole

The 1968 coastwide Dover sole catch of 14.6 million lbs was 21.7% above the 1967 total and about 1 million lbs (6.4%) below the 10-year average.

Canada. Landings of Dover sole in British Columbia in 1968 were 231,000 lbs with 36% taken from Area 4B and 32% from Area 5D.

Washington. Dover sole landings in 1968 totalled 1.5 million lbs; up 53% over 1967 but still 29% below the 1958-67 mean. The Goose Island grounds in Queen Charlotte Sound (Area 5B) have become increasingly important in the production of Dover sole and have contributed an average of about one-third of the landings during the past five years.

Oregon. Landings of Dover sole increased to 4.3 million lbs in 1968; up 21.3% from the 1967 total and about equal to the 10-year mean. Catch/effort also increased to 448 lb/hr in 1968 from 431 lb/hr in 1967.

California. A total of 8.5 million lbs of Dover sole was landed in 1968 compared to 7.2 million lbs in 1967 and 8.8 million lbs for the 10-year mean. The 1968 catch was, therefore, an 18% increase over the 1967 catch but 3% less than the 1958-67 mean. The majority of the catch (6.4 million lbs) came from Area 1C where high landings occurred from May through October.

V. REVIEW OF DATA EXCHANGE PROCEDURES

1. Procedures of Current Exchanges of Data

a. Tagging Summaries

At the 1968 meeting, California agreed to compile summaries of all tagging experiments from 1955 to the present that are complete and also data on new and incomplete tagging experiments. All agencies agreed at the 1969 meeting that this tagging inventory is useful and the format for reporting was finalized.

b. Status Reports

It was suggested that it may be desirable to retain all available statistics in the status reports, rather than dropping a year of data each year, by using a 10-year moving average. Therefore, in order to avoid bulky tables, catch means for 5-year periods prior to the 10-year moving average were proposed.

2. Expansion of Data Exchange

a. Statistical Data being Exchanged with Soviet Union

Considerable discussion took place concerning the inability of the Technical Sub-Committee to discuss the Soviet Union trawl fishery due to limitations imposed on the use of Soviet catch statistics presently being exchanged under the current series of US-USSR bilateral scientific meetings.

b. Boundaries of International Statistical Areas

Statistical boundaries recognized by PMFC as related to boundaries recognized by other groups, e.g., INPFC, FAO, US-USSR agreements, etc., were discussed at length. It was agreed that PMFC Area 6 would encompass waters off southeastern Alaska bounded on the south by a line running 225° True from Cape Muzon and on the west by the longitude of 144°W or 147°W - the particular line to be determined after consultation with Alaska and other state agencies. It was agreed that PMFC Area 7 would encompass waters of the Gulf of Alaska west of the western boundary of PMFC Area 6.

VI. REVIEW OF CURRENT AND PROPOSED RESEARCH

Canada. Groundfish staff of the Fisheries Research Board of Canada, Nanaimo Biological Station, consisted of three biologists, seven technicians and one clerk in 1968. Two of the technical staff worked primarily on the

collection of statistics and samples from the commercial trawling operations and the other personnel were divided between the Near Seas Investigation and the Rockfish Investigation.

The Near Seas Investigation continued to assess the status of groundfish stocks in waters adjacent to British Columbia by the collection and analysis of data on catch and fishing effort and by routine port sampling for data on growth, mortality and recruitment of the various species. Age and growth studies are continuing on rock sole and petrale sole, and studies are in progress on the effect of various conditions of salinity and temperature on the development of the flathead sole egg.

The Rockfish Investigation completed two cruises: (1) a G.B. Reed cruise for the purposes of continuing studies on rockfish maturity, spawning season and larval identification and to study ocean perch distribution and abundance, and (2) an I.D.S. chartered Royal Canadian cruise to determine the feasibility of using a midwater trawl to sample rockfish schools unavailable to the G.B. Reed on-bottom trawl. The midwater trawl tests were unsuccessful due to operational difficulties with the gear.

Substantial progress has been made in the analysis of ocean perch age determination and growth, in the development of sablefish culture techniques, and in the development of a technique for determining the age of Pacific cod by scale reading. A study of length-weight relationships in various species of trawl-caught fish revealed differences within a species of sufficient magnitude to suggest that a length-weight formula should be used with considerable caution. Examination of depth-of-capture data for trawl-caught species suggests that the Canadian trawl fishery has been remarkably consistent in its conduct over the last ten years.

Washington. With the addition of two new biologists, the groundfish investigation staff of the Washington Department of Fisheries now stands at seven biologists and three scientific aides. In addition, a scientific aide position at the federal-state co-operative groundfish aging unit located at the USBCF Biological Lab in Seattle was funded by the PMFC and filled in July 1968.

Five tagging trips were conducted during 1968. The purpose of two of the trips was to obtain further knowledge of the migration and distribution patterns of petrale sole off the Washington and British Columbia coasts. Pacific cod migration studies were continued in Puget Sound by tagging in Bellingham Bay. A study was undertaken to obtain an estimate of population size, survival and mortality rates of English sole in Discovery Bay (Strait of Juan de Fuca) and migration information on both English sole and Pacific cod.

Continuing programs included:

i. age determination on Pacific ocean perch, Pacific hake, petrale sole and English sole;

ii. Pacific ocean perch biological cruises to measure changes in age, size and sex composition and variance in catch rate, sex ratio and size composition;

iii. collection of catch and effort data via the fisherman interview program;

iv. port sampling (with improved coverage).

A major amount of time for two biologists this past year has been spent on improving data processing procedures for the statistical and biological trawl data collected via the fisherman interview and port sampling programs.

A review of existing bottomfish regulations in inside waters of Puget Sound and Juan de Fuca Strait has been underway since 1967. Some revisions of regulatory areas and seasons have been made and studies implemented on trawl net codend minimum mesh size.

Oregon. The trawl fish staff of the Fish Commission of Oregon in 1968 consisted of four biologists, three seasonal assistants, and one laboratory aide. One biologist will be added to the staff in July 1969. Tagging for 1968 was restricted to one cruise in April; a total of 6,367 Dover sole were tagged in Area 3A. Age and growth studies are continuing on Dover sole and population dynamics analysis is underway. Charter time is scheduled for the spring of 1970 to study distribution, abundance and age and size composition of deepwater stocks of Dover sole. A status report on rockfish is well underway - primarily aimed at showing changes in distribution of catches by area and depth and the changes in species composition for the years 1963-68.

California. The California Bottomfish Program staff remains at five biologists and six months of seasonal assistance . The 88-309 Shellfish and Bottomfish Data Analysis Project with a staff of one biometrician, two biologists, a clerk and a keypunch operator also work closely with the California Bottomfish staff. Two cruises of the N.B. Scofield were completed this year in Area 1C; a total of 1,516 Dover sole were tagged and released. A comprehensive study of the population dynamics of Dover sole in Area 1C has been initiated; age determinations of Dover, English and petrale sole in market samples are continuing and sampling for age, size and sex composition of these three species was continued at a number of ports. The 88-309 Data Analysis Group has designed and implemented data storage and retrieval systems

for bottomfish data. The study of the population dynamics of petrale sole in the Fort Bragg area (1B) has been resumed; a fishing power computer program is in the process of debugging.

VII. REVIEW OF PROJECTS OF MUTUAL INTEREST

1. Action on 1968 Technical Sub-Committee Recommendations

a. Recommendation 1: Monitoring and Reporting on Expanding Multiple-Use Fishery

The predicted rapid expansion of the multiple-use fishery in Washington failed to occur in 1968 due mainly to poor market conditions and mechanical problems of a new fish-meal plant. A new floating fish-meal plant commenced operation at Neah Bay in mid-November 1968, but experienced mechanical difficulties and was forced to limit landings. Design of a fish protein concentrate pilot plant for Aberdeen is underway.

b. Recommendation 2: Continued Exchange of Computer Programs

Exchange of computer programs during the past year appeared to be of value. Washington State presented graphical material on depth distribution of Pacific ocean perch which was provided using a program developed at Nanaimo and modified for use at the University of Washington Computer Center.

2. Hake

The 1968-69 Puget Sound Hake (Merluccius productus) Fishery

Five vessels participated in the autumn fishery in Saratoga Passage; six vessels fished on the Port Susan hake population during the winter and spring. Landings as of May 15, 1969, approximated 8.2 million lbs. Success was improved in both areas over the previous season. The possibility of record high landings this past season faded when two major markets for fish meal and animal feed put a limit on landings or stopped accepting hake during March.

3. Status of PMFC Bulletin 7

Eight papers dealing with various aspects of the biology of English sole and other trawl-caught species have been submitted for publication in PMFC Bulletin 7. Five of these papers are edited and ready for printing and the other three will be edited shortly. The bulletin is scheduled for publication this summer.

4. Size Limits - Lingcod and Sablefish

a. Lingcod

Comment was invited from Canada on the need for a minimum size limit of 23 inches on lingcod. It was pointed out that the Canadian regulation was enacted many years ago, perhaps because of the fears of fishermen that stocks were declining. The minimum was established probably on the basis of the minimum acceptable market size. However, studies in the Strait of Georgia indicate that the minimum size (23 inches total length) may be close to that which will give maximum sustainable yield. Lingcod under that size are largely immature, at least on the inshore grounds. The applicability of this information to offshore grounds where fishing intensity is heavier has yet to be determined.

b. Sablefish

Washington reported a decline in sablefish landings over the past few years in spite of a high demand for the species. Concern for the stocks was expressed and comments were invited on size limits. It was agreed that additional research emphasis be placed on the species, particularly as it applies to size limits now in effect in British Columbia, Washington, and Oregon.

VIII. INTERNATIONAL PROBLEMS

1. Status of Foreign Trawl Fisheries off the West Coast of Canada and the United States

A discussion took place concerning the foreign trawl fleets off the west coast of Canada and the United States. It was agreed that although the total number of Soviet vessels decreased in 1968, the change in the composition of the fleet from side to stern trawlers probably maintained total harvesting capability of the fleet at least at the level of the past years.

2. Recent Developments in Fisheries Agreements

The second biological meeting between the US and the USSR was held in October 1968, in Moscow, at which time an exchange of 1967 catch statistics for the northeastern Pacific took place; biological data on hake and Pacific ocean perch was exchanged; certain research studies were outlined for implementation during 1969, i.e., cooperative Pacific hake egg and larval surveys off California and an acoustical survey of the Pacific hake standing stock off Washington and Oregon, a Soviet rockfish standing stock estimate off Washington and Oregon, and a Pacific ocean perch and Pacific hake otolith exchange program.

The third US-USSR scientific meeting is projected for November 1969 in Seattle. A negotiating meeting between the US and USSR in January 1969 resulted in a two-year agreement (further extension of original agreement of February 5, 1965) concerning fisheries problems off Washington and Oregon and in the Bering Sea and Gulf of Alaska. A number of restricted fishing zones along the Washington and Oregon coasts which had excluded vessels greater than 110 feet were scrapped. Six newly defined areas from the Washington coast to the northern coast of California were created in which the Soviets agreed not to fish during the period December 1 to April 15 (vessels of either country

less than 110 feet may fish). These areas have supported major winter concentrations of Pacific ocean perch and other rockfish species and the restricted time period occurs when hake are not abundant in the areas. A bilateral negotiating meeting between Japan and the United States was held in Washington, D.C. during November 1968 concerning fisheries problems off the Pacific Northwest. Agreement was reached between the two delegations that would have the effect of reducing Japanese trawl fishing effort for rockfish off Washington and Oregon during the next two years. The Soviets agreed to use a trawl net mesh size of not less than 2.4 to 2.8 inches in their hake fisheries. In order to comply with this agreement Washington changed their minimum mesh size for Pacific hake fishing to 2.5 inches (hake), and Oregon, which previously had no minimum mesh size, adopted the 2 to 2.5 inch standard. South of 48°10'N latitude, the Soviets have again agreed to not conduct a specialized fishery for rockfish.

3. Recommendations for Co-operative Programs

The Sub-Committee recognized the need for additional information on stocks of lingcod and sablefish found off the Pacific coast and made recommendations for additional research under Agenda Item XI.

4. Species Separation in Reports

The Sub-Committee agreed to continue reporting species for PMFC Areas 1A through 5E according to the format in the PMFC Data Series and to include any additional species taken in the Gulf of Alaska (PMFC Areas 6 and 7), according to the species listing shown in INPFC statistics for Gulf of Alaska.

5. Other

The magnitude of the Japanese trawl fishery in the northeastern

Pacific during the years 1965-68 was discussed. Statistics of the fishery in the Gulf of Alaska are not yet available for publication.

IX. CHANGES IN TRAWL REGULATIONS

Current regulations for all agencies are listed in Appendix B.

X. OTHER BUSINESS

There were no submissions under Agenda Item X.

XI. RECOMMENDATIONS

1. Future Work

The Sub-Committee recommends:

i. more detailed study of the lingcod fishery with special emphasis on the complex fishery in Area 3C.

ii. that agencies should attempt to update reports on status of their sablefish fisheries and determine whether or not there is a continued need for regulation where such now exists.

2. Parent Committee

While the Sub-Committee makes no recommendations as such, it wishes to emphasize that statistics from all participants in the groundfish fishery off the Pacific coast are not yet available for the Sub-Committee's consideration.

XII. SCHEDULE OF MEETINGS

1. Schedule of Parent Committee

The International Trawl Committee will meet on Wednesday, October 1, 1969, in Sitka, Alaska.

2. Technical Sub-Committee Eleventh Annual Meeting

The eleventh annual meeting will be held in San Francisco, California, in July 1970.

XIII. ELECTION OF CHAIRMAN

It was agreed that C. R. Forrester, Fisheries Research Board of Canada, would retain the chairmanship in 1970.

XIV. ADJOURNMENT

The meeting was adjourned at 12:00 noon, June 19, 1969.

XV. APPENDICES

A. Agenda

B. Synopsis of Otter Trawl Regulations

C. Summaries of Recent Tagging of Petrale Sole

D. Summaries of Recent Tagging of English Sole

E. Summaries of Recent Tagging of Dover Sole

F. Summaries of Recent Tagging of Pacific Cod

G. Summary of Recent Tagging of Lingcod

AGENDA AS ADOPTED
TECHNICAL SUB-COMMITTEE OF THE
INTERNATIONAL TRAWL FISHERY COMMITTEE
SEATTLE JUNE 1969

10TH ANNUAL MEETING

I. CALL TO ORDER

II. APPOINTMENT OF SECRETARY

III. APPROVAL OF AGENDA

IV. STATUS REPORTS

1. Total Catch and Effort for the 1968 Trawl Fishery
2. Petrale Sole
   a. Catch/Effort
   b. Definition of Stocks
   c. Winter Fishery
   d. Summary
3. Lingcod
   a. Catch/Effort (Area 3C)
   b. Stocks in Area 3C
4. Pacific Cod
   a. Catch/Effort (Areas 3C, 5D)
5. Pacific Ocean Perch
   a. Catch/Effort (Areas 3B to 5B)
6. English Sole
7. Dover Sole

V. REVIEW OF DATA EXCHANGE PROCEDURES

1. Procedures of Current Exchanges of Data
   a. Tagging Summaries
   b. Status Reports
2. Expansion of Data Exchange
   a. Statistical Data being Exchanged with Soviet Union
   b. Boundaries of International Statistical Areas

VI. REVIEW OF CURRENT AND PROPOSED RESEARCH

1. Tagging
2. Biological Studies
3. Sampling Program
4. Special Projects (IDS & US PL 88-309)
5. Other Studies

VII. REVIEW OF PROJECTS OF MUTUAL INTEREST

1. Action on 1968 Technical Sub-Committee Recommendations
   a. Recommendation 1. Monitoring and Reporting on Expanding Multiple-Use Fishery
   b. Recommendation 2. Continued Exchange of Computer Programs
2. Hake
3. Status of PMFC Bulletin 7
4. Size Limits - Lingcod and Sablefish

VIII. INTERNATIONAL PROBLEMS

1. Status of Foreign Trawl Fisheries off the West Coast of Canada and the United States
2. Recent Developments in Fisheries Agreements
3. Recommendations for Co-operative Programs
4. Species Separation in Reports
5. Other

IX. CHANGES IN TRAWL REGULATIONS

X. OTHER BUSINESS

XI. RECOMMENDATIONS

1. Future Work
2. Parent Committee

XII. SCHEDULE OF MEETINGS

1. Parent Committee Meeting
2. 11th Annual Meeting of Technical Sub-Committee

XIII. ELECTION OF CHAIRMAN

XIV. ADJOURNMENT

SYNOPSIS OF OTTER TRAWL REGULATIONS IN EFFECT JULY 1, 1969, IN THE SEVERAL JURISDICTIONS OF THE PACIFIC COAST

TYPE OF REGULATIONS

1. CLOSURE OF FISHING BY SEASON

California

No seasonal closure for fin-fish.

Oregon

No seasonal closure for fin-fish.

Washington

No closed periods for ocean trawl fishing. Several varying closures are applied to bottomfish regulatory areas in Puget Sound and Juan de Fuca Strait (PMFC Area 4A).

Canada

During period December 20 to April 15 inclusive, no brill (petrale sole) may be taken except for incidental catch not exceeding 3,000 lbs per boat trip for a maximum of two boat trips per month.

During period December 1 to the last day of February, no lingcod may be taken in waters of the Strait of Georgia.

Several varying closure periods are applied to local areas inside the Strait of Georgia.

Alaska

Sablefish may be taken from May 1 to November 30 by longline only in southeastern Alaska. Otherwise no restrictions on bottomfish.

2. CLOSURE OF FISHING BY AREA

California

Use of trawl nets prohibited in waters less than three nautical miles from nearest point of land on mainland shore, including certain named bays, except between Point Sur and Cape San Martin in Monterey County in waters not less than one nautical mile from the nearest point of land from the mainland shore

and

trawl nets with meshes of not less than 5-1/2 inches may be used between Point Arguello and a line due south from El Capitan Point in Santa Barbara County in waters not less than 25 fathoms and not less than one nautical mile from shore.

Possession of trawl net prohibited in California from Santa Barbara-Ventura County line south to Mexican border. Permits may be issued by the Department to possess, only for the purpose of transportation, trawl or dragnets in this area.

Oregon

Otter trawl fishing limited to waters of the Pacific Ocean.

Washington

Several rather limited areas within Puget Sound and Juan de Fuca Strait (PMFC Area 4A) are closed entirely to otter trawling.

Canada

Chief Supervisor may prohibit all trawl fishing in any area at any time when deemed necessary to prevent adverse effects on population.

Numerous named areas in inside waters are closed entirely to trawl fishing.

Alaska

See Section 1 above.

3. DEFINITION OF LEGAL GEAR

California

See Appendix B, page 5

Oregon

A bag-shaped net composed of wings, body, intermediate and codend sections, having floats along the upper edge and weights along the lower edge of the mouth, held open by trawl doors or a fixed beam frame. The codend section is the last 50 meshes of a trawl net. The intermediate section is the next 50 meshes forward of the codend section.

Washington

See Appendix B, page 5

Canada

See Appendix B, pages 6 and 7

Alaska

Trawls legal for bottomfish with exception noted above.

4. MINIMUM SIZE LIMITS

California

No California halibut (Paralichthys californicus) which weighs less than 4 pounds in the round, or less than 3-1/2 pounds dressed head on, or less than 3 pounds dressed head off, may be taken, possessed or sold. The holder of a commercial fishing licence may possess during one day for non-commercial use not more than 30 pounds of California halibut of less than such minimum weight if taken incidentally in commercial fishing.

Oregon

Minimum size of 11 inches over-all for Dover, English, or petrale sole, with an aggregate tolerance of sub-legal fish not to exceed 250 per boat trip. This regulation applies only when a boat is using or has on board a trawl net with a single wall intermediate and/or codend of mesh less than 4-1/2 inches or a double wall codend or liner of mesh less than 5 inches, or a hog-ring type codend of mesh less than 6 inches.

Minimum size of 17 inches measured from origin of first dorsal to end of tail or 3 pounds dressed weight for sablefish.

Washington

Minimum size of 17 inches from origin of first dorsal fin to end of tail for sablefish.

Minimum size of 48 inches and maximum size of 72 inches for round sturgeon and minimum of 33 inches and maximum of 53 inches for dressed sturgeon.

Canada

Minimum size of 12 inches tip of snout to tip of tail for lemon sole, rock sole, brill (petrale sole) and starry flounder.

Minimum size of 2-1/2 lb dressed head off for sablefish (blackcod).

Minimum size of 23 inches tip of snout to tip of tail and minimum weight of 3 lb dressed head off for lingcod.

Alaska

No restrictions.

5. REGULATION OF UTILIZATION (FOOD AND NON-FOOD USE)

California

Trawl-caught fish used for other than human consumption taxed 5% per 100 lb. Whole fish ground for mink food must be held under refrigeration.

Oregon

No restrictions.

Washington

It is lawful to use all species of fish under the jurisdiction of the Washington State Department of Fisheries for any utilization purpose other than: Pacific salmon (Oncorhynchus spp.), Pacific halibut (Hippoglossus stenolepsis) and Pacific herring* (Clupea pallasii) which can be used only for human consumption or fishing bait.

*Except when lawfully taken from Puget Sound, herring fishing Areas 2 and 2A.

Canada

No limitation on utilization of legally-caught bottomfish.

Alaska

No restrictions.

6. MISCELLANEOUS REGULATIONS

California

Otter or beam trawl operators must keep a daily logbook and render the information to the Department. The required recording includes:

(a) Time and place of each haul, each trip.
(b) Duration of haul and approximate composition of catch for each haul.
(c) Time of trip.
(d) Total landed weight by species.

Oregon

Trawl boat operators must keep a daily log in logbooks provided by the Fish Commission. The required recording includes:

(a) Time, date and place of each haul, each trip.
(b) Duration of haul and approximate composition of catch for each haul.

THE SHRIMP FISHERY

California

It is unlawful to possess more than 500 pounds of fish other than shrimp or prawns on a boat engaged in the shrimp fishery. This does not apply to salmon taken with hook and line.

Oregon

No restrictions on incidental catch. Minimum size limits apply.

Washington

It is lawful to retain, for human consumption, bottomfish of legal size, other than halibut, not exceeding 3,000 lb per boat per trip when taken incidental to lawful shrimp fishing in the ocean.

Canada

No provisions covering incidental catches of fin-fish, although regulations imply that no fin-fish may be taken with less than 4-inch mesh.

Alaska

Regulations regarding shrimp fishing in Alaska are as follows: Legal gear, shrimp - shrimp may be taken by means of pots, beam trawls, and otter trawls except as follows:

(a) Shrimp may not be taken at any time by means of otter trawls in the combined area of District 8, District 10 eastward of the longitude of Cape Fanshaw, and District 6 northward of the latitude and eastward of the longitude of Point Baker.

(b) District 8: the minimum mesh size for beam trawls shall be 1-1/2 inch cotton mesh or 1-1/4 inch nylon mesh. Open fishing season, shrimp: shrimp may be taken from January 1 to December 31. In the combined area of District 8, District 10 eastward of the longitude of Cape Fanshaw, and District 6 northward of the latitude and eastward of the longitude of Point Baker, shrimp may be taken from May 1 to February 14.

SUMMARY OF LAWS AND REGULATIONS RELATING TO DEFINITION AND MEASUREMENT OF NET MESH SIZES ON THE PACIFIC COAST

1. LEGAL DEFINITION OF MINIMUM MESH SIZE

California

No natural or synthetic webbing less than 4-1/2 inches, except for mesh actually covering floats, may be possessed on boat.

Hog-rings bags or codends shall have minimum mesh measurement not less than 6 inches when wet.

Double bags or codends shall have individual meshes, coinciding knot for knot in each layer, not less than 4-1/2 inches in length.

Chafing gear allowed that shall not cover more than the last 120 meshes in length of net and bag combined and not more than the bottom one-half of the circumference of the net and bag. Not more than 8 rib-lines may be attached to any type bag or codend.

Oregon

Minimum mesh of 2-1/2 inches when fishing for hake.

Chafing gear not to cover more than the bottom half of the codend.

Double bag or codends shall have individual meshes coinciding knot for knot in each layer.

Washington

Minimum mesh size of 3-1/2 inches in otter-trawl net codend and 3 inches forward of the codend or bag section of the net.

Minimum mesh size of 2-1/2 inches for otter-trawl nets used in the coastal hake fishery and 2 inches for trawl nets used in the hake fishery in Puget Sound bottomfish regulatory Areas 3 and 4.

Meshes of hog-ring and rope-type chafing gear shall measure not less than 7 inches.

Canada

"Mesh size" means the distance between the inside of diagonally opposite knots of any mesh as determined after the net has been immersed in water.

It is not permissible to use a double layer of mesh in the codend of a trawl unless the layers are tied or knitted together in such a manner that the size of any mesh is not reduced by the layer attached to that mesh.

Minimum mesh size in trawl is 3-1/2 inches (other than shrimp) with the following exceptions. In the Strait of Georgia, minimum mesh size for trawl (other than shrimp) in the final 50 meshes including codend is:

(a) Manilla or sisal - 4-3/4 inches
(b) Cotton - 4-1/2 inches
(c) Synthetic fiber - 4-1/4 inches

Operating vessel shall have a scupper opening not less than 36 inches wide or multiple openings not less than 12 inches each.

Alaska

No minimum mesh size.

2. LEGAL DEFINITION OF METHODS OF MEASUREMENT

California

"By taking at least four meshes and measuring them inside the knots while they are simultaneously drawn closely together."

Hog-rings - "by taking at least four meshes and measuring them inside the wire hog-rings while they are simultaneously drawn closely together," and "measured when wet between proximal wires, rings, etc."

Oregon

The average mesh size of not less than 5 consecutive meshes, measurements to be made to the nearest 1/4 inch by stretching meshes taut and measuring the distance between the inside of one knot to the inside of the opposite knot of one mesh when the mesh is stretched vertically, wet or dry, using a tension of ten pounds on any 3 consecutive meshes, then measuring the middle mesh of the three while under tension.

Washington

The size of a mesh of any net is the distance between the inside of one knot to the outside of the opposite vertical knot of one mesh when the mesh is stretched vertically, while wet, by using a tension of ten pounds on any 3 consecutive meshes, then measuring the middle mesh of the three while under tension.

Canada

All regulations for British Columbia specify "extension measure." This is not further defined.

Alaska

All mesh is measured from one knot to include the next knot.

3. METHOD OF MEASUREMENT USED BY ENFORCEMENT OFFICERS

California

As described above.

Oregon

Generally by stretching nets and measuring single meshes with ruler or flexible tape.

Washington

Web is stretched under tension, usually by hanging a 10-pound weight, and measurement is made using a ruler or flexible tape.

Canada

Officers measure when the net is wet by grasping diagonally opposite knots and applying tension so as to close the mesh. Measurement is made from the inside of one knot to the inside of the knot diagonally opposite.

Alaska

Nil.

4. DEVICES USED OR CAPABLE OF USE FOR MEASUREMENT

California

No special devices.

Oregon

No special devices. Prototype I.C.E.S. gauge is available - not used for enforcement.

Washington

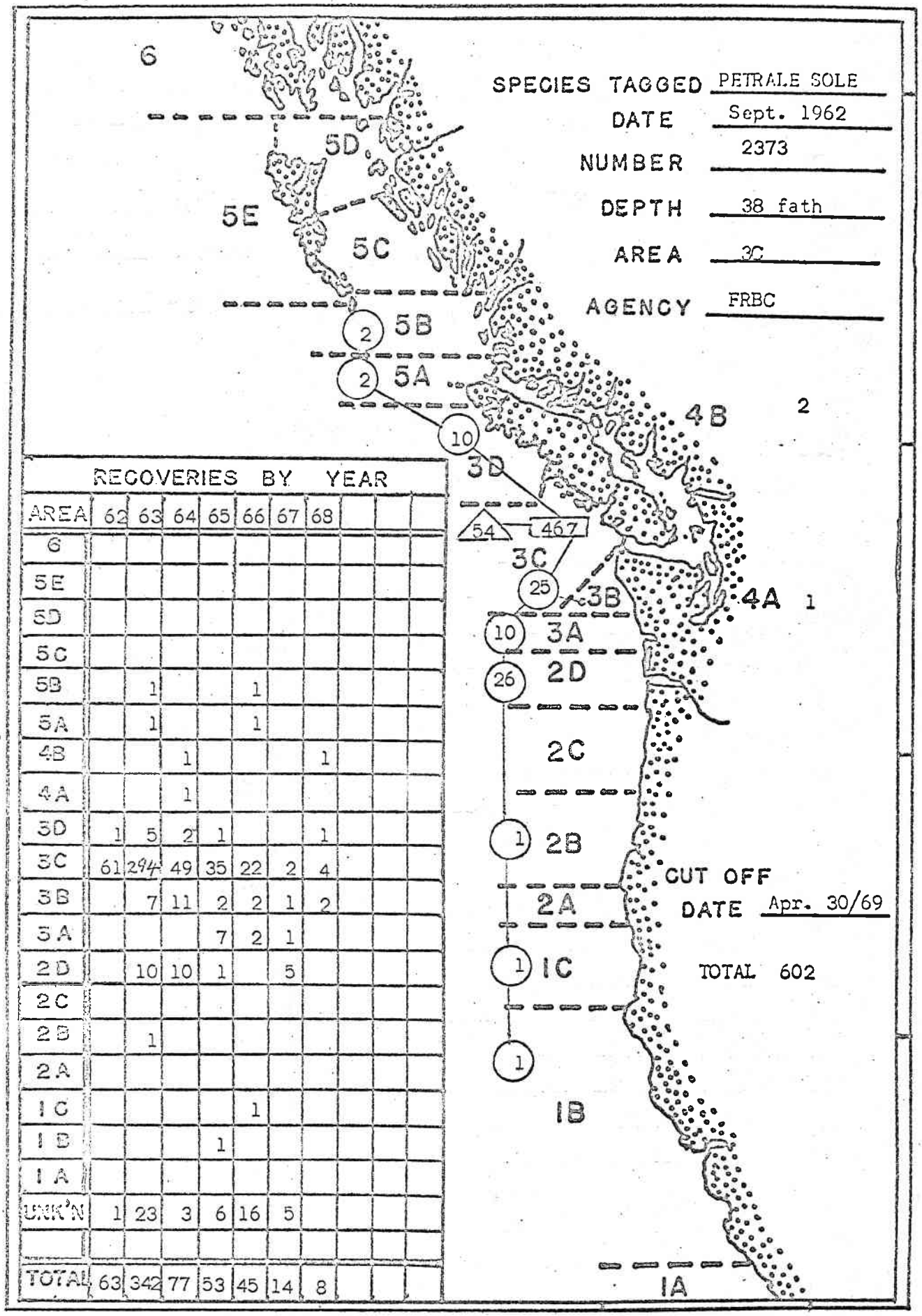
No special device.

Canada

No special device. An official I.C.E.S. gauge is available - not used for enforcement.

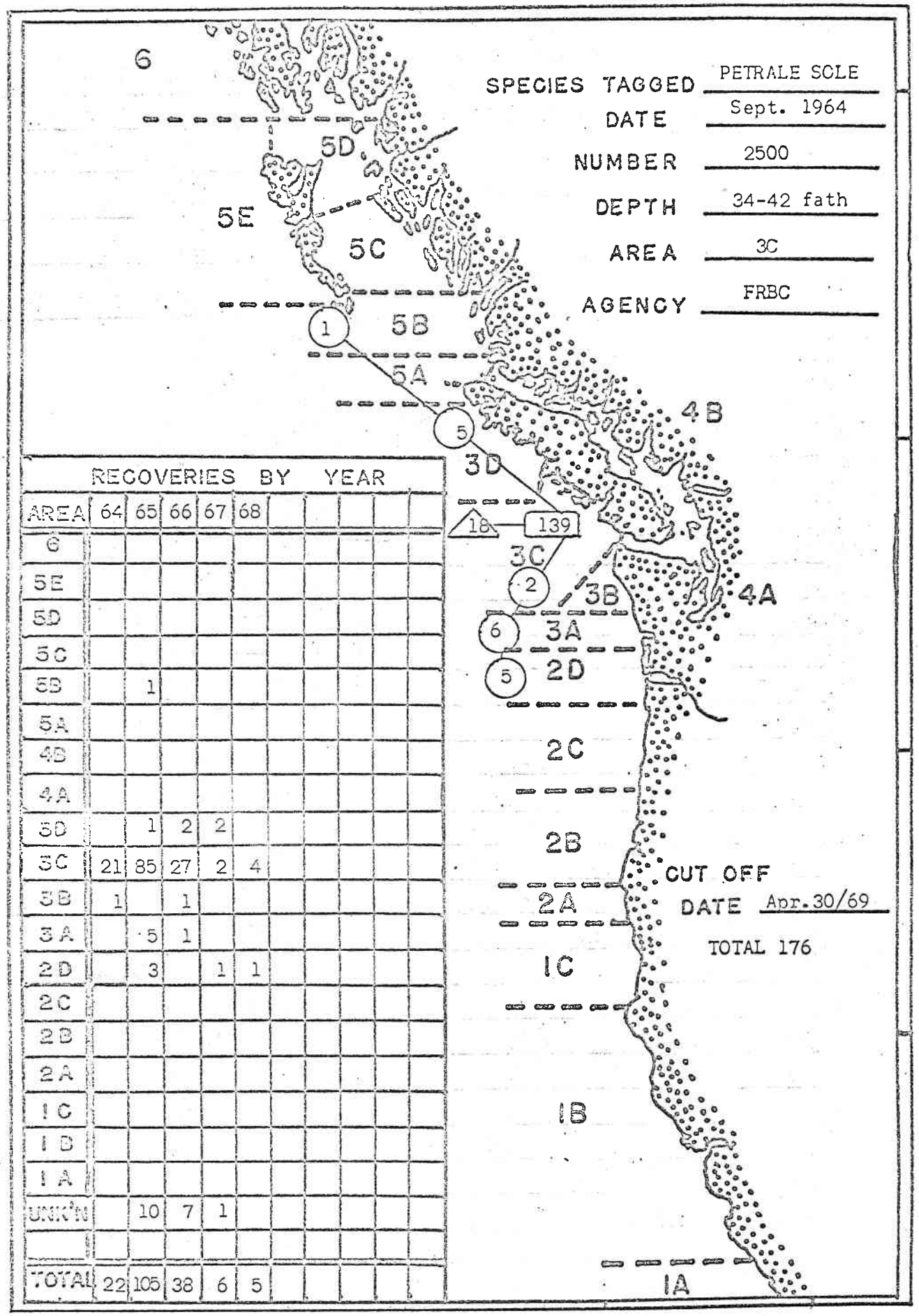
Alaska

Nil.



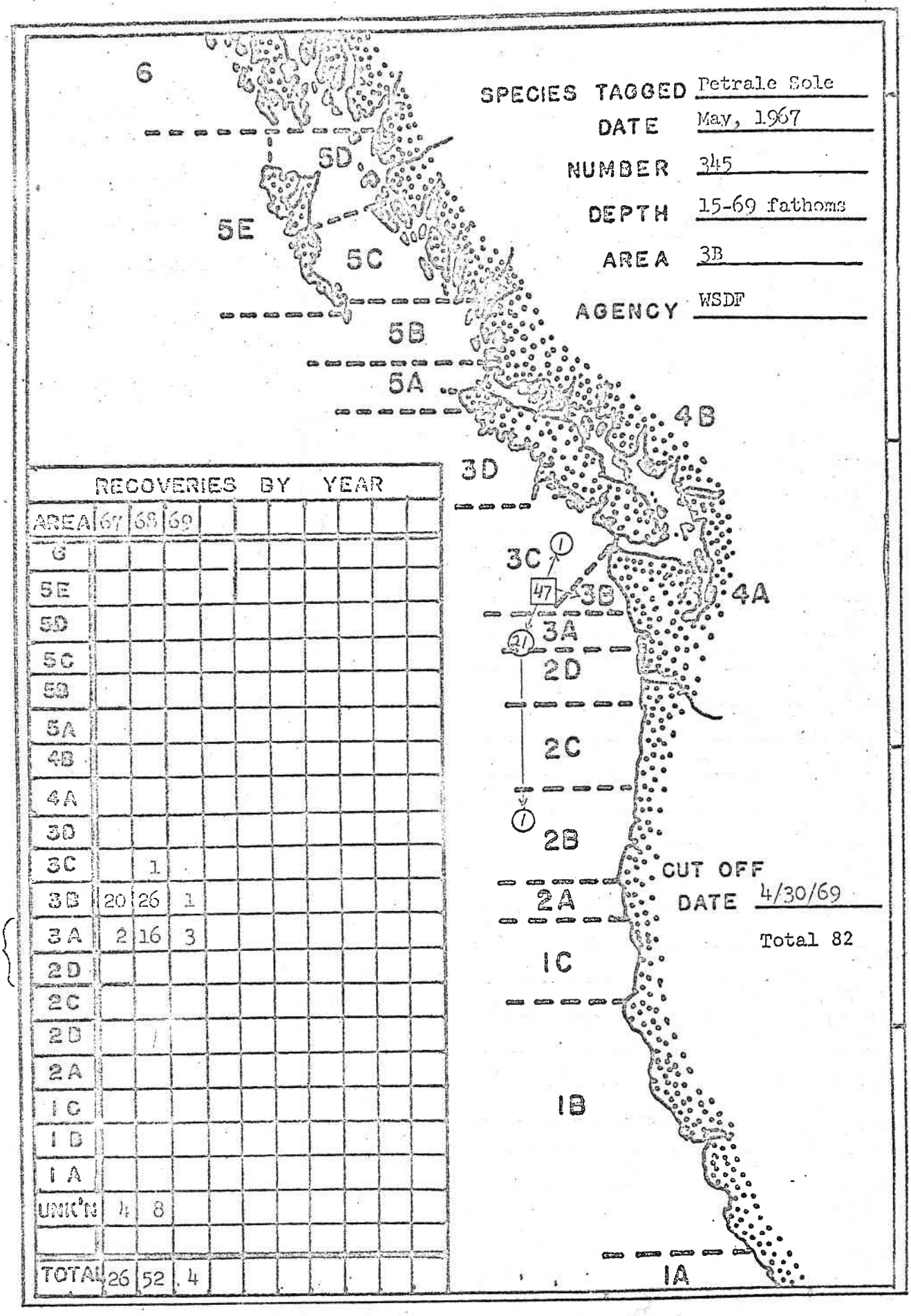
RECOVERIES BY YEAR

AREA	62	63	64	65	66	67	68			
6										
5E										
5D										
5C										
5B		1			1					
5A		1			1					
4B			1				1			
4A			1							
3D	1	5	2	1			1			
3C	61	294	49	35	22	2	4			
3B		7	11	2	2	1	2			
3A				7	2	1				
2D		10	10	1		5				
2C										
2B		1								
2A										
1C					1					
1B				1						
1A										
UNK'N	1	23	3	6	16	5				
TOTAL	63	342	77	53	45	14	8			



RECOVERIES BY YEAR

AREA	64	65	66	67	68
6					
5E					
5D					
5C					
5B		1			
5A					
4B					
4A					
3D		1	2	2	
3C	21	85	27	2	4
3B	1		1		
3A		5	1		
2D		3		1	1
2C					
2B					
2A					
1C					
1B					
1A					
UNK'N		10	7	1	
TOTAL	22	105	38	6	5



SPECIES TAGGED Petrale Sole
DATE May, 1967
NUMBER 345
DEPTH 15-69 fathoms
AREA 3B
AGENCY WSDF

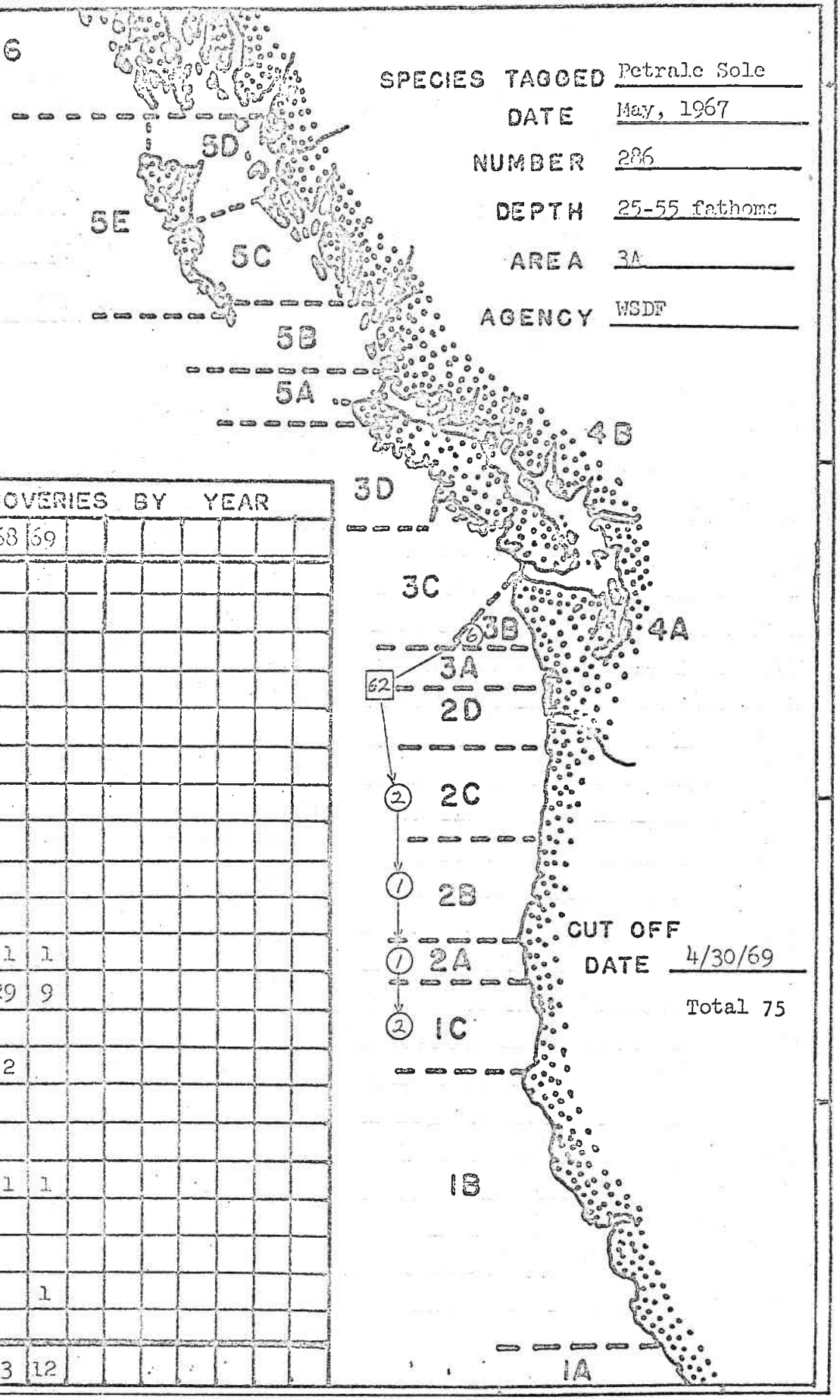
RECOVERIES BY YEAR

AREA	67	68	69
6			
5E			
5D			
5C			
5B			
5A			
4B			
4A			
3D			
3C		1	
3B	20	26	1
3A	2	16	3
2D			
2C			
2D		1	
2A			
1C			
1D			
1A			
UNK'N	4	8	
TOTAL	26	52	4

combined

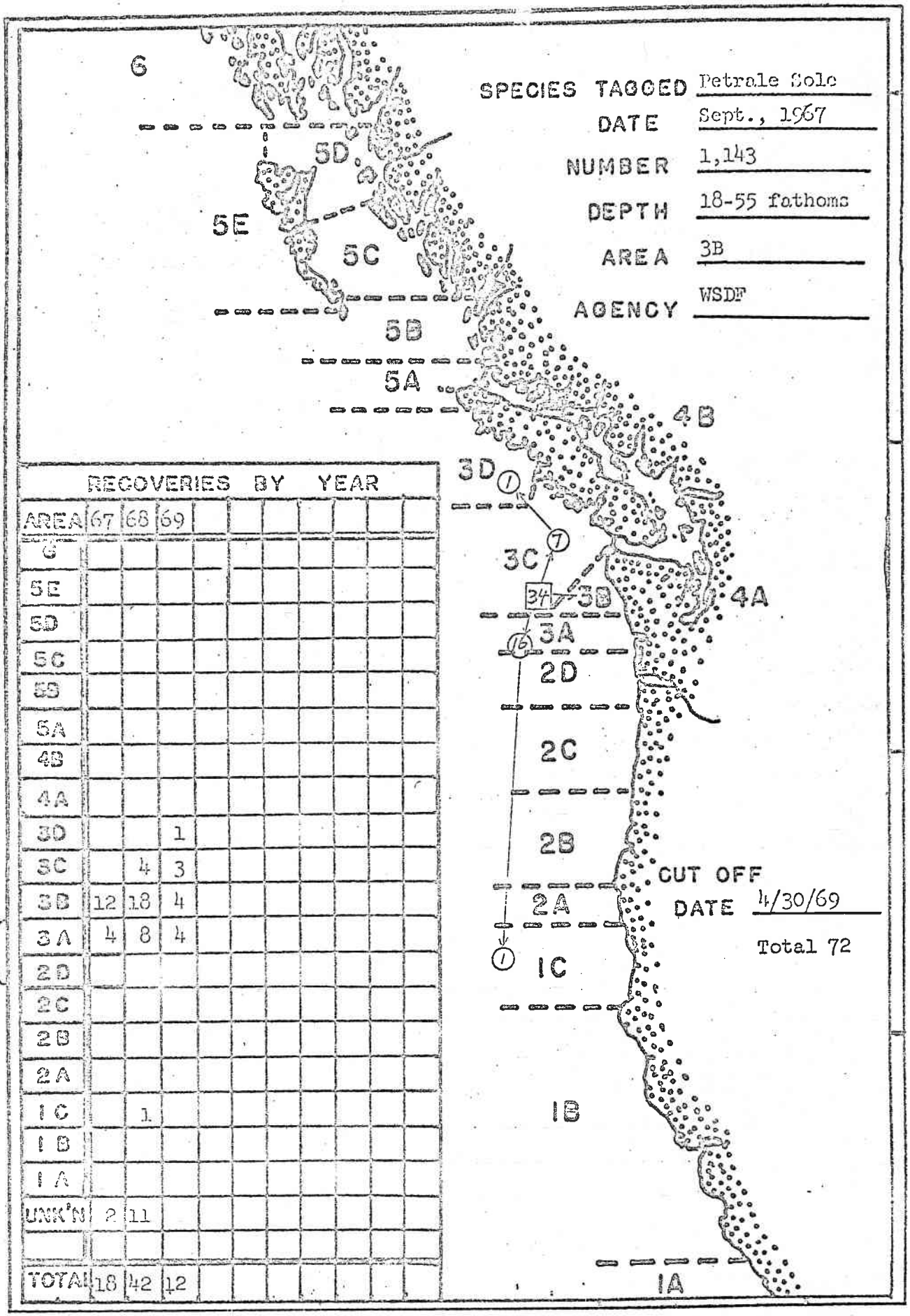
Total 82

SPECIES TAGGED Petrale Sole
DATE May, 1967
NUMBER 286
DEPTH 25-55 fathoms
AREA 3A
AGENCY WSDF



RECOVERIES BY YEAR

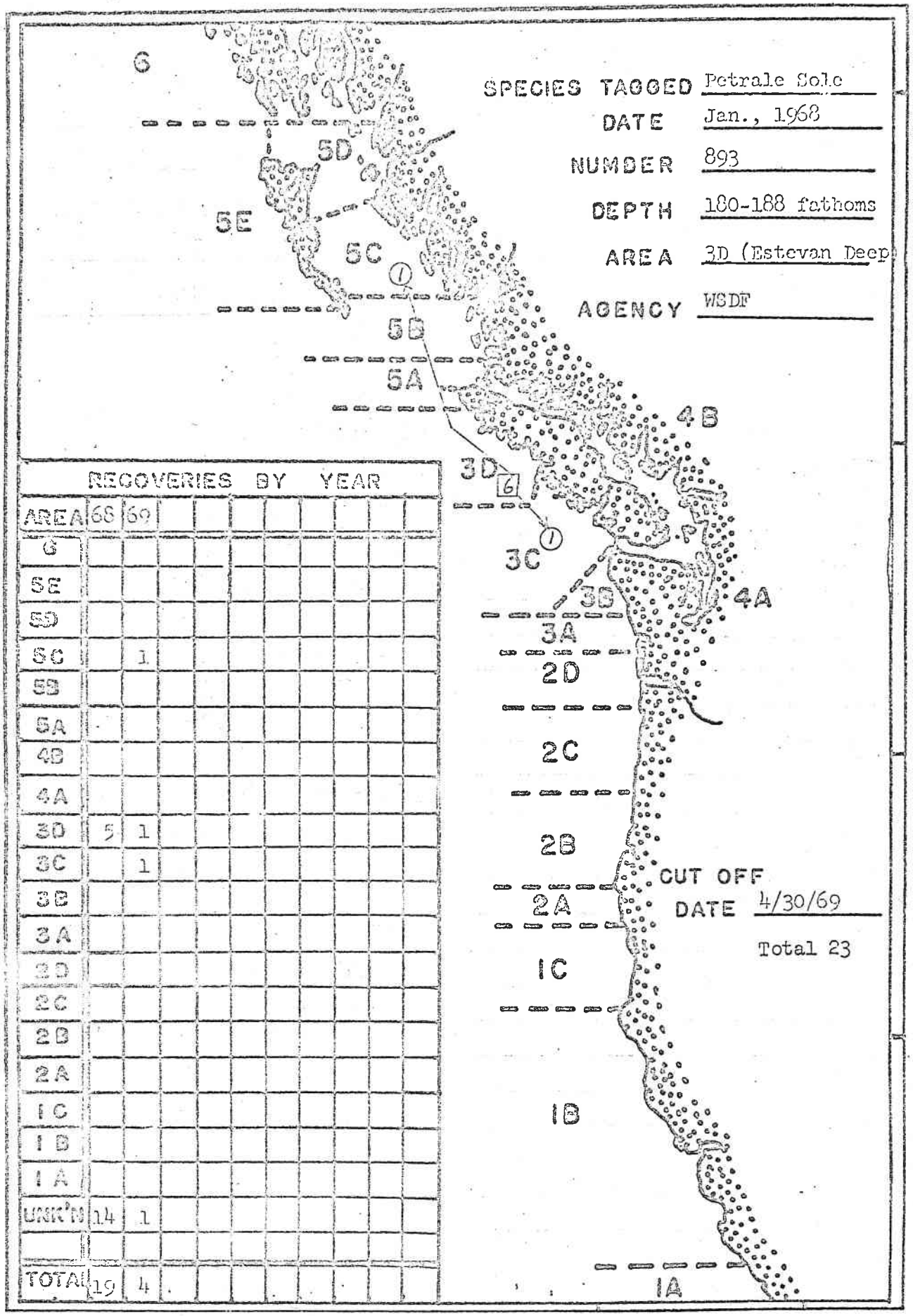
AREA	67	68	69
6			
5E			
5D			
5C			
5B			
5A			
4B			
4A			
3D			
3C			
3B	4	1	1
3A	24	29	9
2D			
2C		2	
2B	1		
2A	1		
1C		1	1
1B			
1A			
UNK'N			1
TOTAL	30	33	12



RECOVERIES BY YEAR

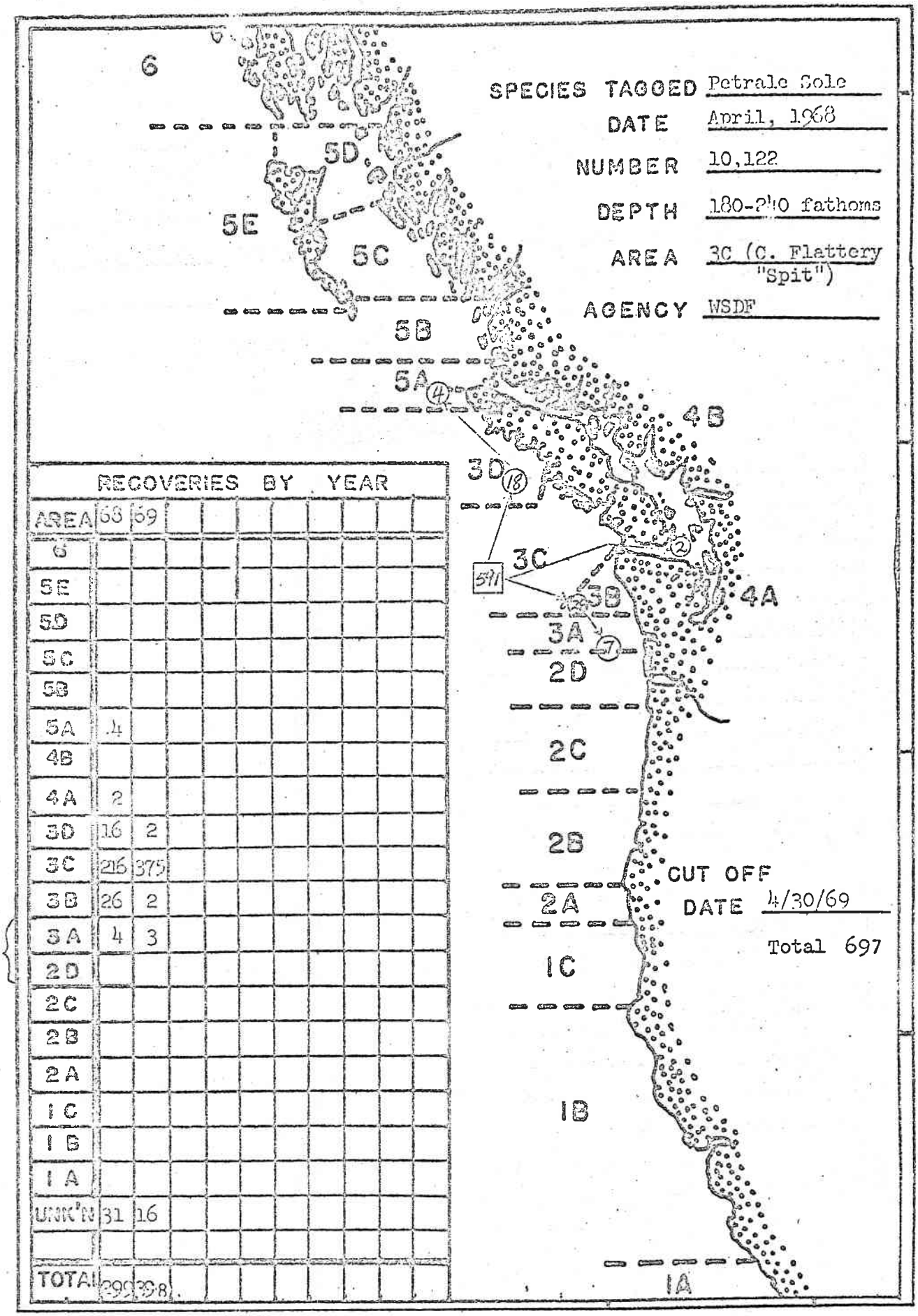
AREA	67	68	69							
6										
5E										
5D										
5C										
5B										
5A										
4B										
4A										
3D			1							
3C		4	3							
3B	12	18	4							
3A	4	8	4							
2D										
2C										
2B										
2A										
1C		1								
1B										
1A										
UNK'N	2	11								
TOTAL	18	42	12							

combined



RECOVERIES BY YEAR

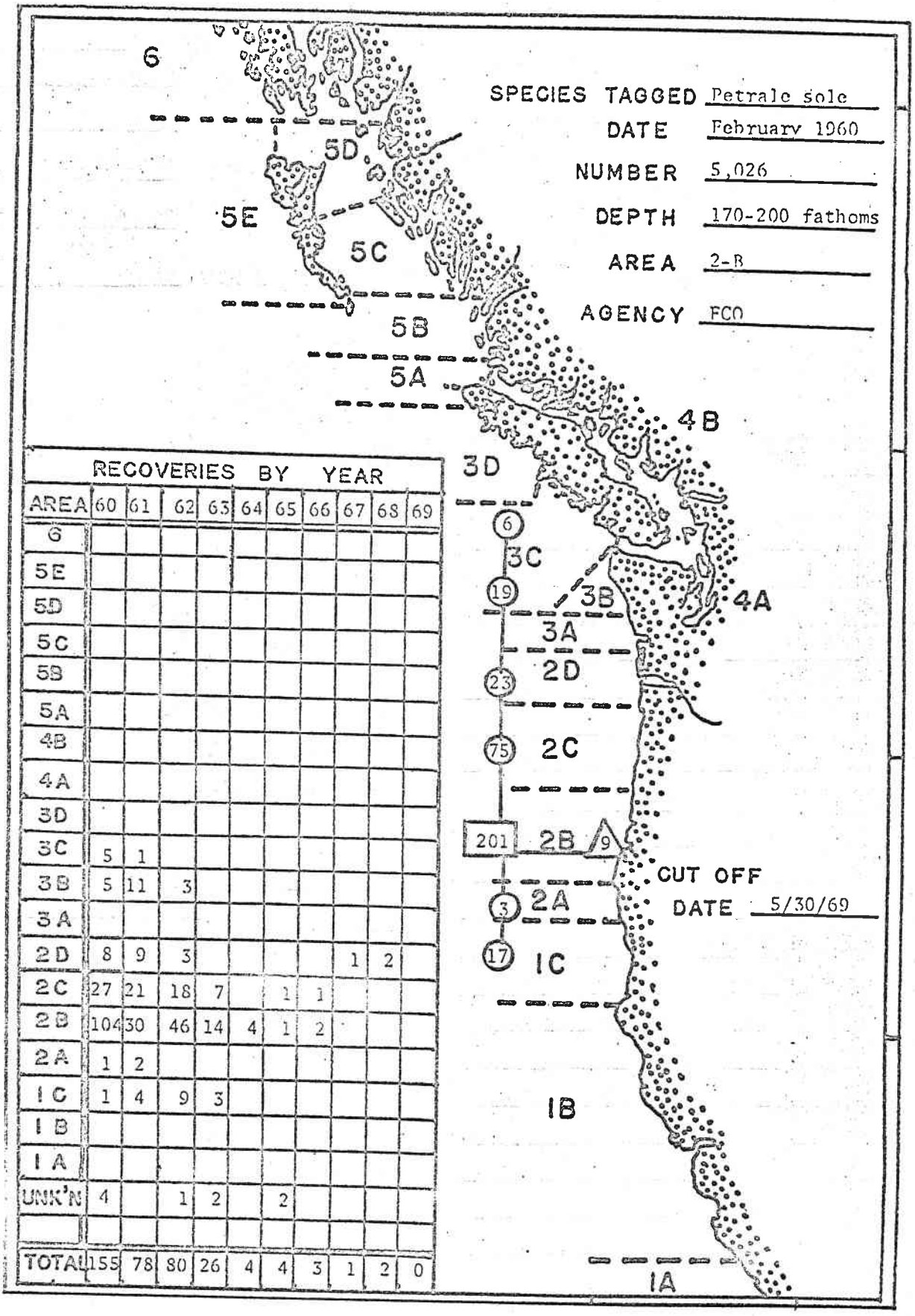
AREA	68	69
6		
5E		
5D		
5C		1
5B		
5A		
4B		
4A		
3D	5	1
3C		1
3B		
3A		
2D		
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N	14	1
TOTAL	19	4



RECOVERIES BY YEAR

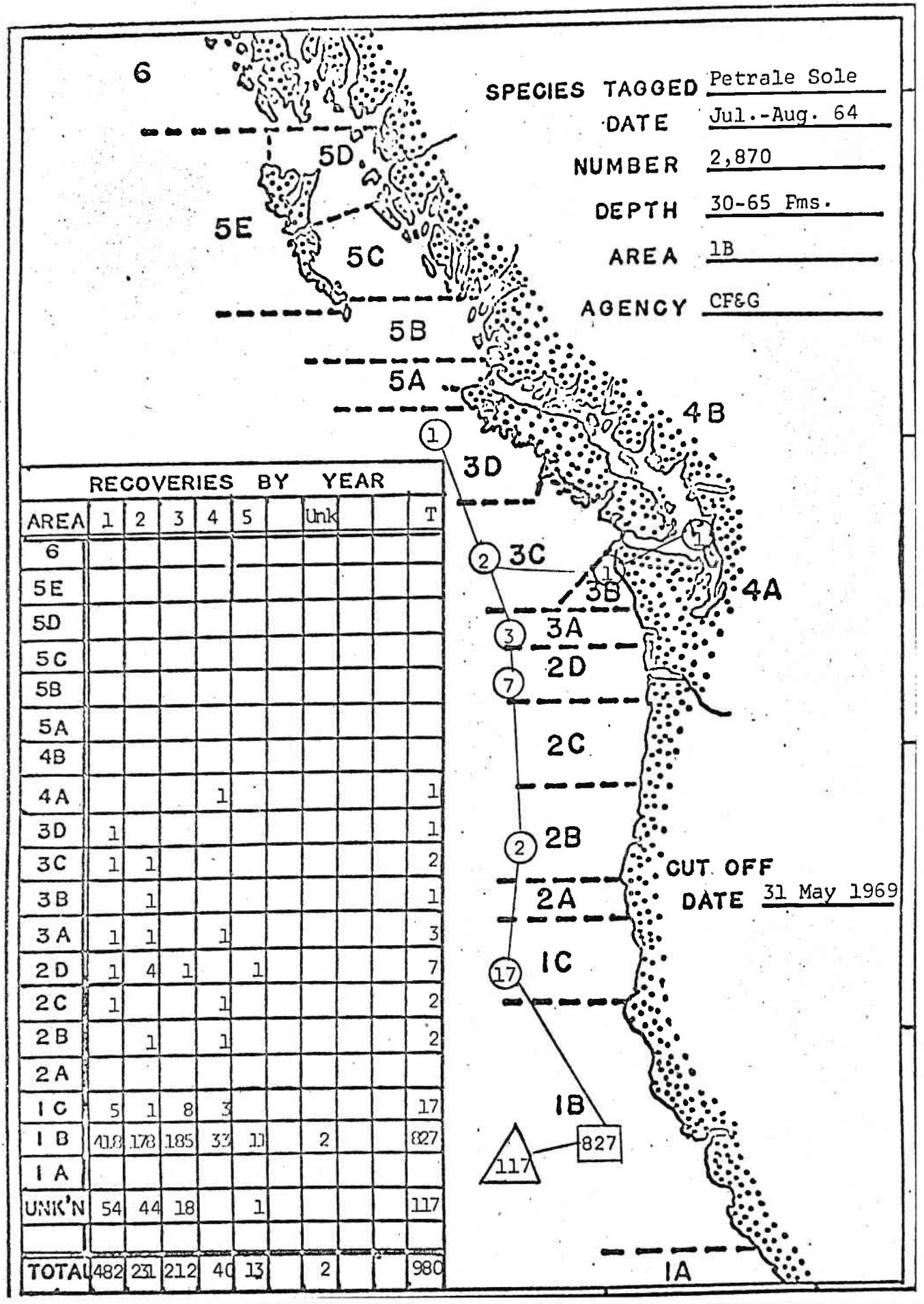
AREA	68	69								
6										
5E										
5D										
5C										
5B										
5A	4									
4B										
4A	2									
3D	16	2								
3C	216	375								
3B	26	2								
3A	4	3								
2D										
2C										
2B										
2A										
1C										
1B										
1A										
UNK'N	31	16								
TOTAL	299	398								

combined



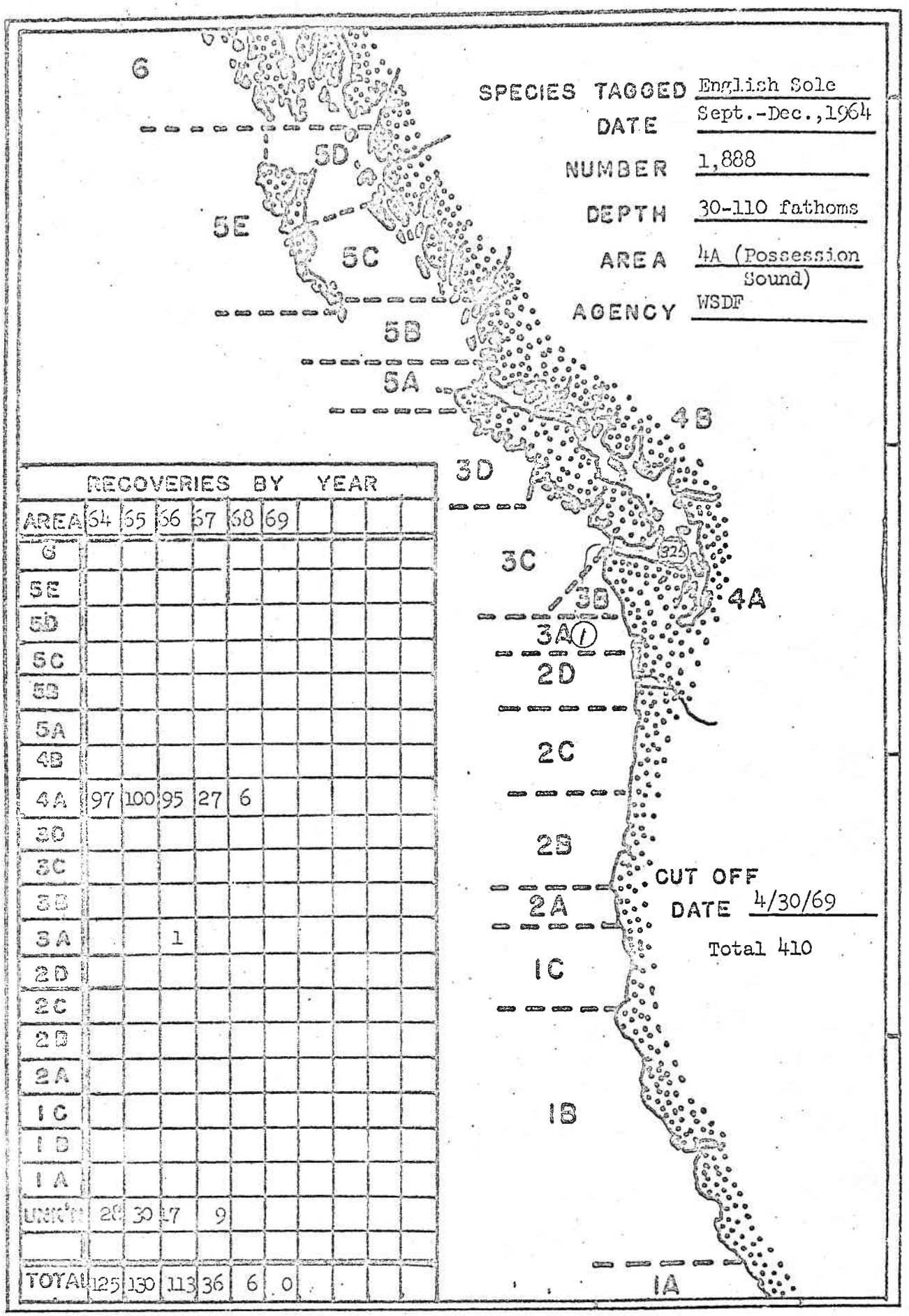
RECOVERIES BY YEAR

AREA	60	61	62	63	64	65	66	67	68	69
6										
5E										
5D										
5C										
5B										
5A										
4B										
4A										
3D										
3C	5	1								
3B	5	11	3							
3A										
2D	8	9	3					1	2	
2C	27	21	18	7		1	1			
2B	104	30	46	14	4	1	2			
2A	1	2								
1C	1	4	9	3						
1B										
1A										
UNK'N	4		1	2		2				
TOTAL	155	78	80	26	4	4	3	1	2	0



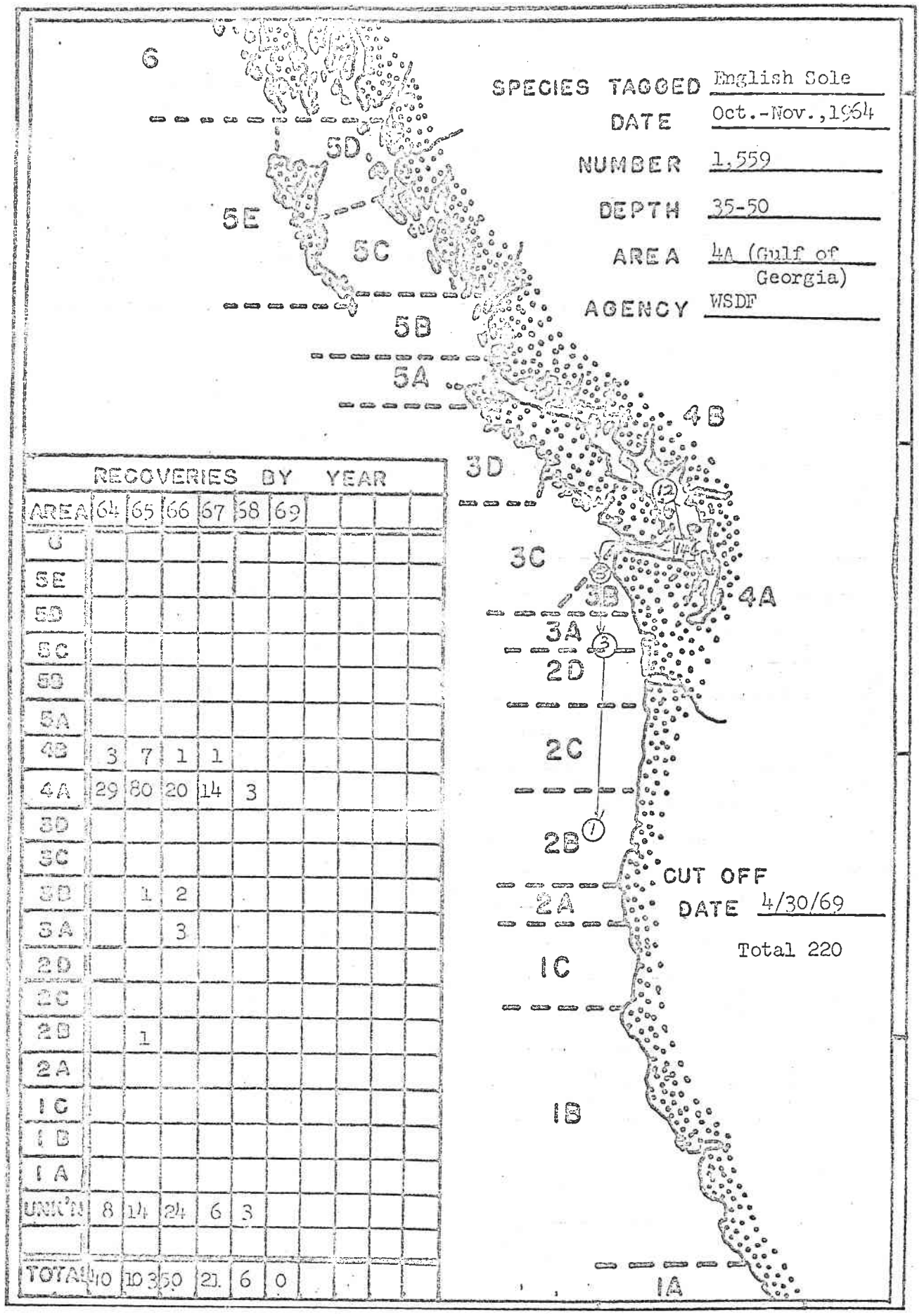
RECOVERIES BY YEAR

AREA	1	2	3	4	5		Unk			T
6										
5E										
5D										
5C										
5B										
5A										
4B										
4A				1						1
3D	1									1
3C	1	1								2
3B		1								1
3A	1	1		1						3
2D	1	4	1		1					7
2C	1			1						2
2B		1		1						2
2A										
1C	5	1	8	3						17
1B	418	178	185	33	11		2			827
1A										
UNK'N	54	44	18		1					117
TOTAL	482	231	212	40	13		2			980



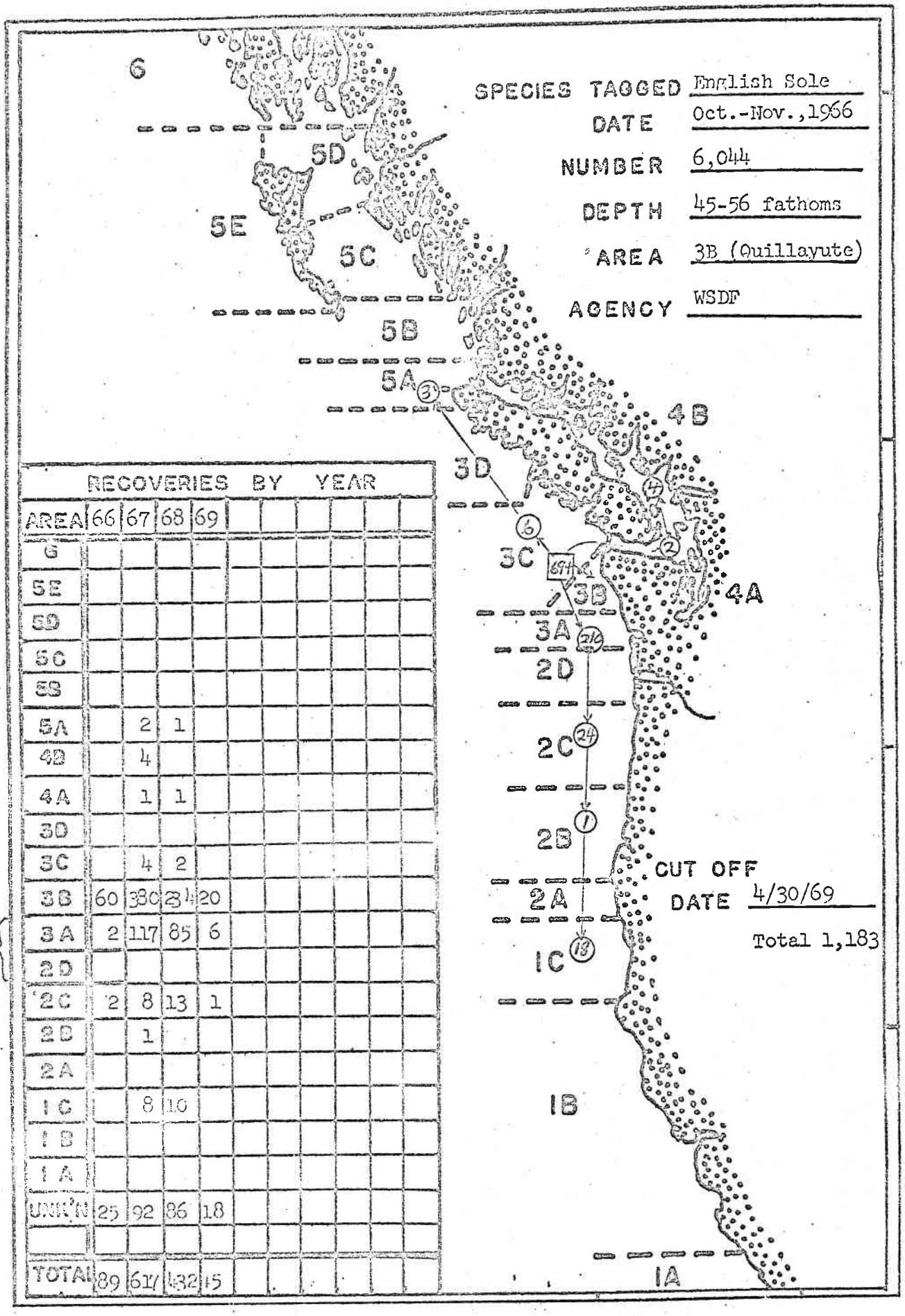
RECOVERIES BY YEAR

AREA	64	65	66	67	68	69
6						
5E						
5D						
5C						
5B						
5A						
4B						
4A	97	100	95	27	6	
3D						
3C						
3B						
3A			1			
2D						
2C						
2B						
2A						
1C						
1D						
1A						
unk'n	28	30	17	9		
TOTAL	125	130	113	36	6	0



RECOVERIES BY YEAR

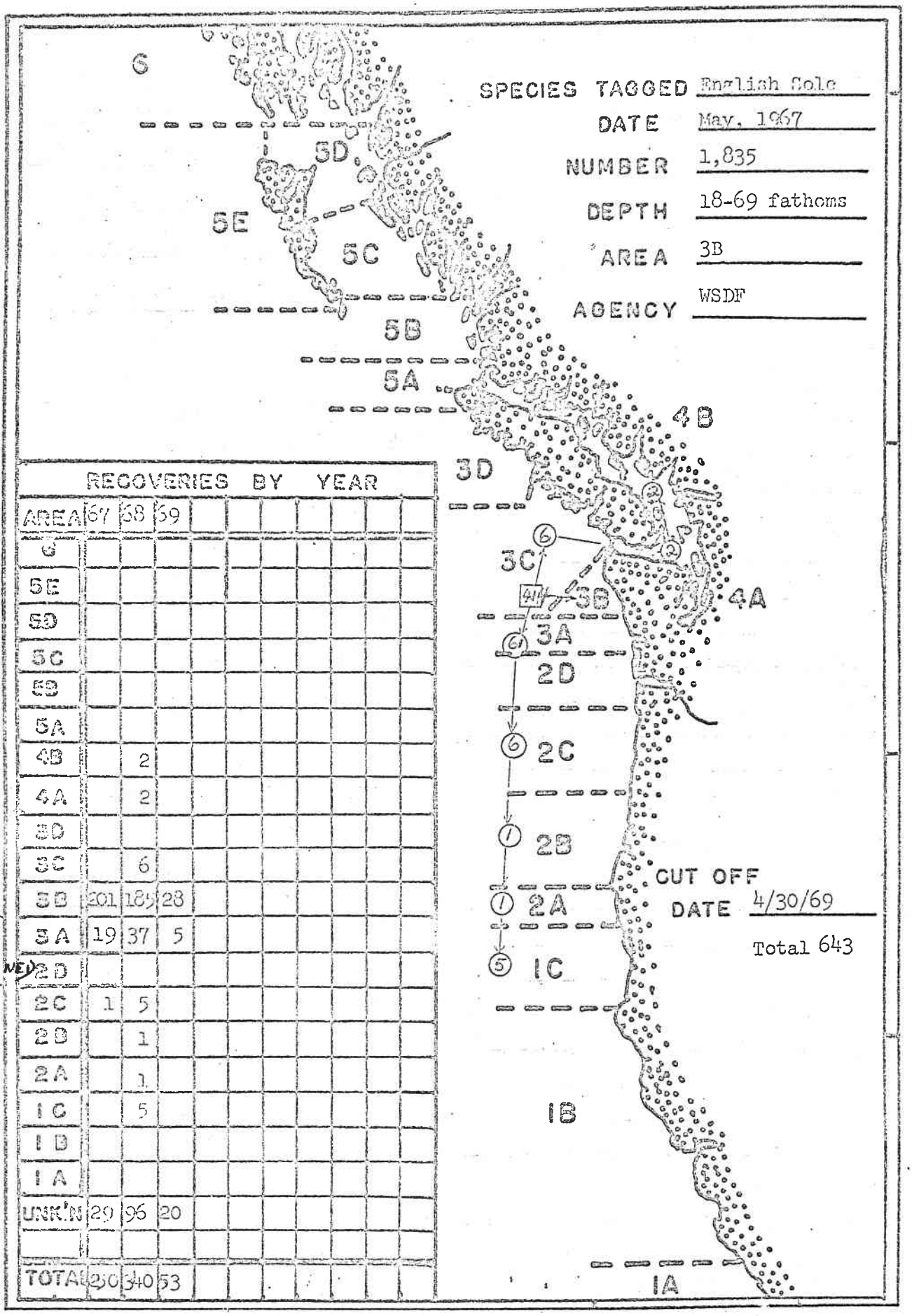
AREA	64	65	66	67	68	69
6						
5E						
5D						
5C						
5B						
5A						
4B	3	7	1	1		
4A	29	80	20	14	3	
3D						
3C						
3B		1	2			
3A			3			
2D						
2C						
2B		1				
2A						
1C						
1B						
1A						
UNK'N	8	14	24	6	3	
TOTAL	40	103	50	21	6	0



RECOVERIES BY YEAR

AREA	66	67	68	69
6				
5E				
5D				
5C				
5B				
5A		2	1	
4B		4		
4A		1	1	
3D				
3C		4	2	
3B	60	380	234	20
3A	2	117	85	6
2D				
2C	2	8	13	1
2B		1		
2A				
1C		8	10	
1B				
1A				
UNK'N	25	92	86	18
TOTAL	89	617	432	45

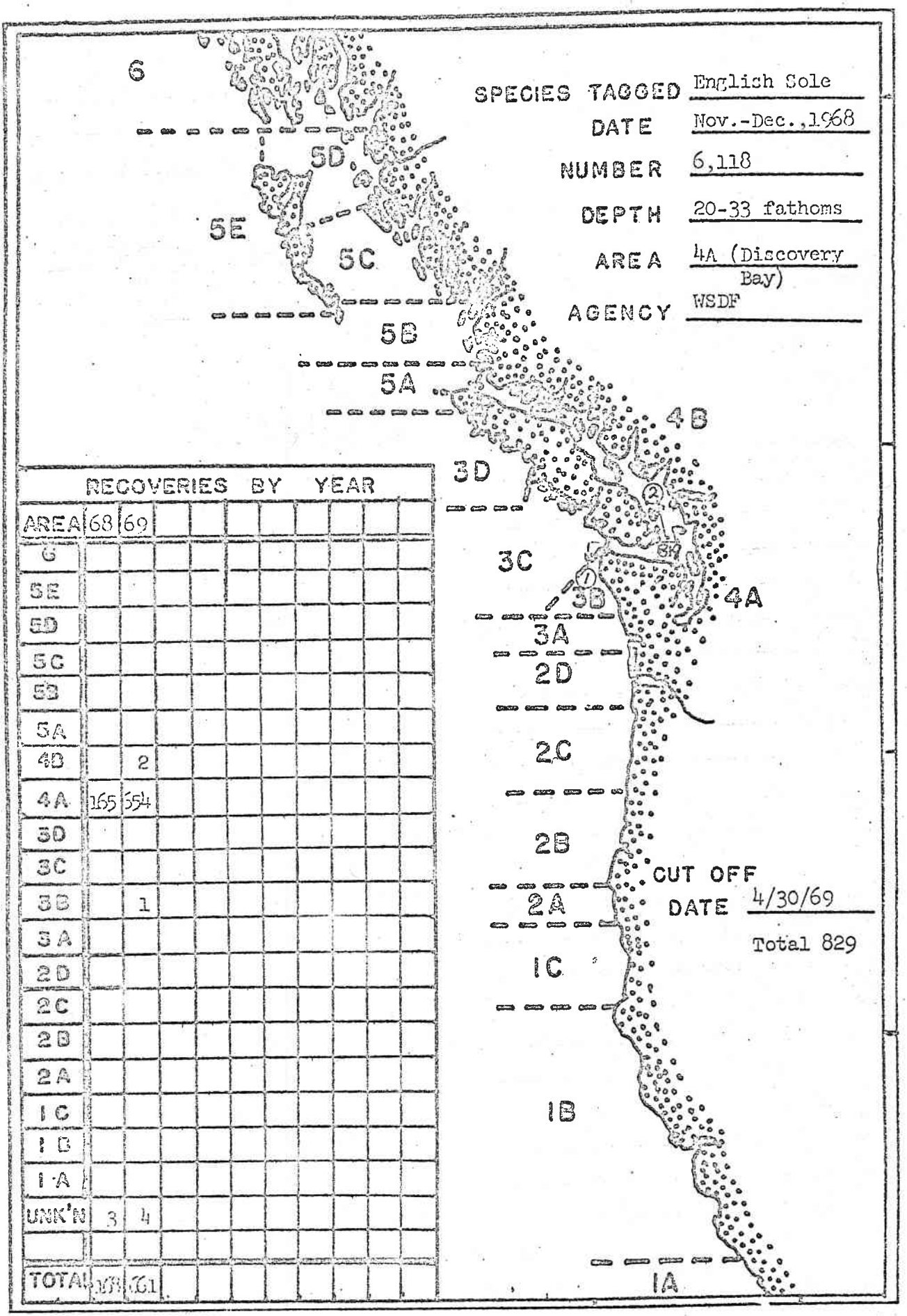
combined



RECOVERIES BY YEAR

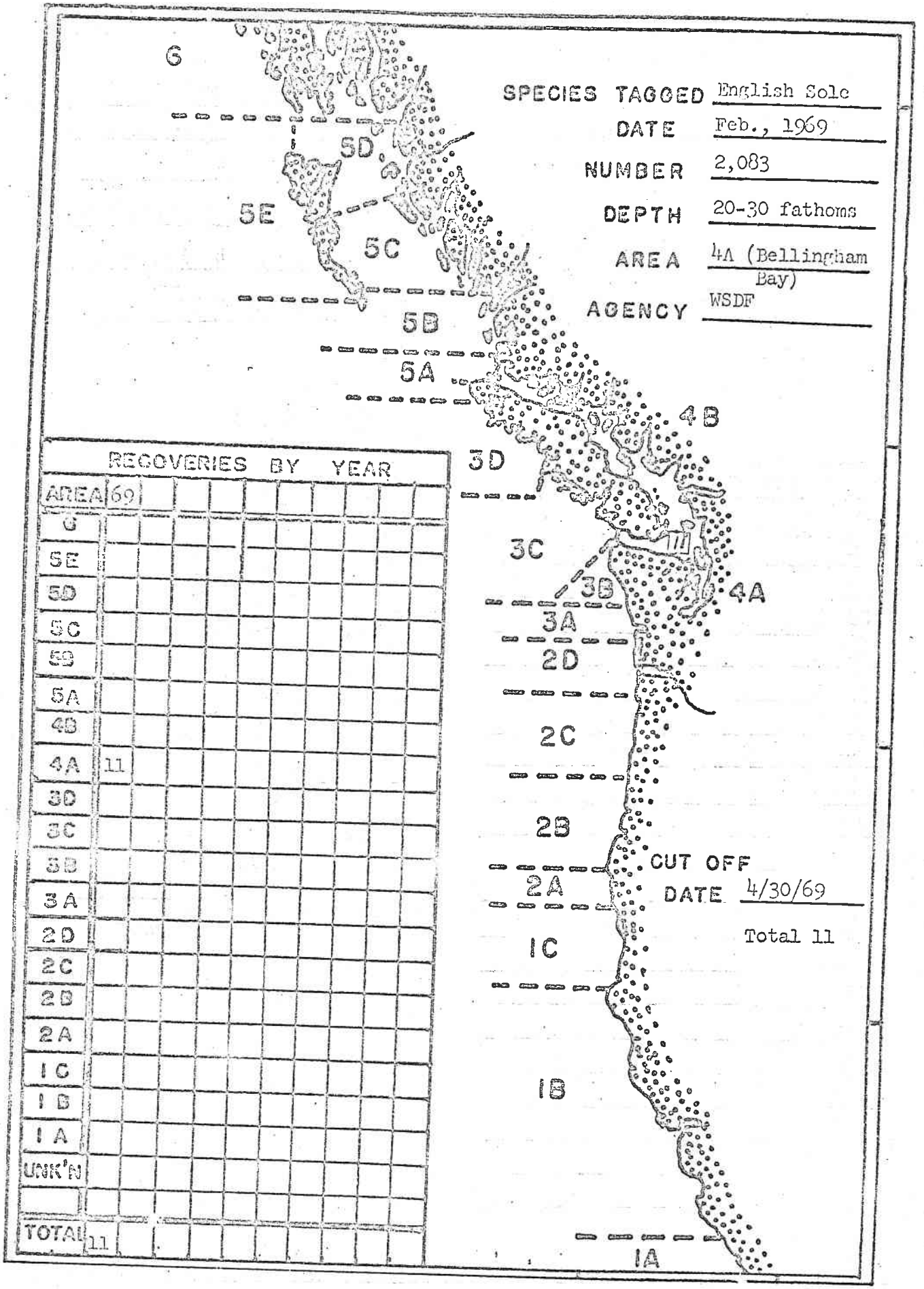
AREA	67	68	69
6			
5E			
5D			
5C			
5B			
5A			
4B		2	
4A		2	
3D			
3C		6	
3B	201	185	28
3A	19	37	5
2D			
2C	1	5	
2B		1	
2A		1	
1C		5	
1B			
1A			
UNK'N	29	96	20
TOTAL	250	340	53

lined combined

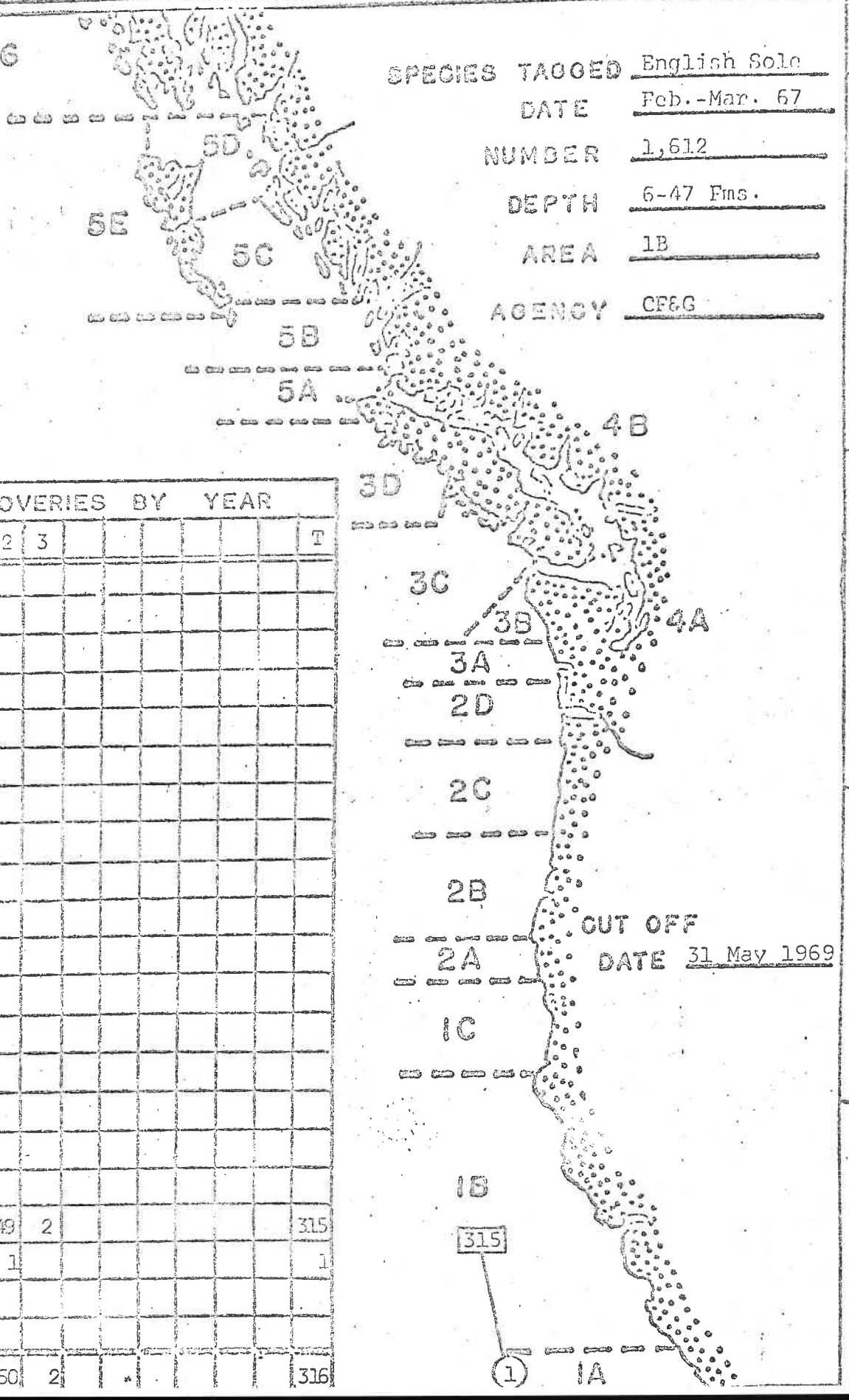


RECOVERIES BY YEAR

AREA	68	69
6		
5E		
5D		
5C		
5B		
5A		
4B		2
4A	165	654
3D		
3C		
3B		1
3A		
2D		
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N	3	4
TOTAL	178	661


6
5D
5E
5C
5B
5A
4B
3D
3C
3B
4A
3A
2D
2C
2B
2A
1C
1B
1A
SPECIES TAGGED English Sole
DATE Feb., 1969
NUMBER 2,083
DEPTH 20-30 fathoms
AREA 4A (Bellingham Bay)
AGENCY WSDF
CUT OFF DATE 4/30/69
Total 11
RECOVERIES BY YEAR
AREA 69
6
5E
5D
5C
5B
5A
4B
4A 11
3D
3C
3B
3A
2D
2C
2B
2A
1C
1B
1A
UNK'N
TOTAL 11

SPECIES TAGGED English Sole
DATE Feb.-Mar. 67
NUMBER 1,612
DEPTH 6-47 Fms.
AREA 1B
AGENCY CF&G



RECOVERIES BY YEAR

AREA	1	2	3							T
6										
5E										
5D										
5C										
5B										
5A										
4B										
4A										
3D										
3C										
3B										
3A										
2D										
2C										
2B										
2A										
1C										
1B	264	49	2							315
1A		1								1
UNK'N										
TOTAL	264	50	2							316

SPECIES TAGGED English Sole

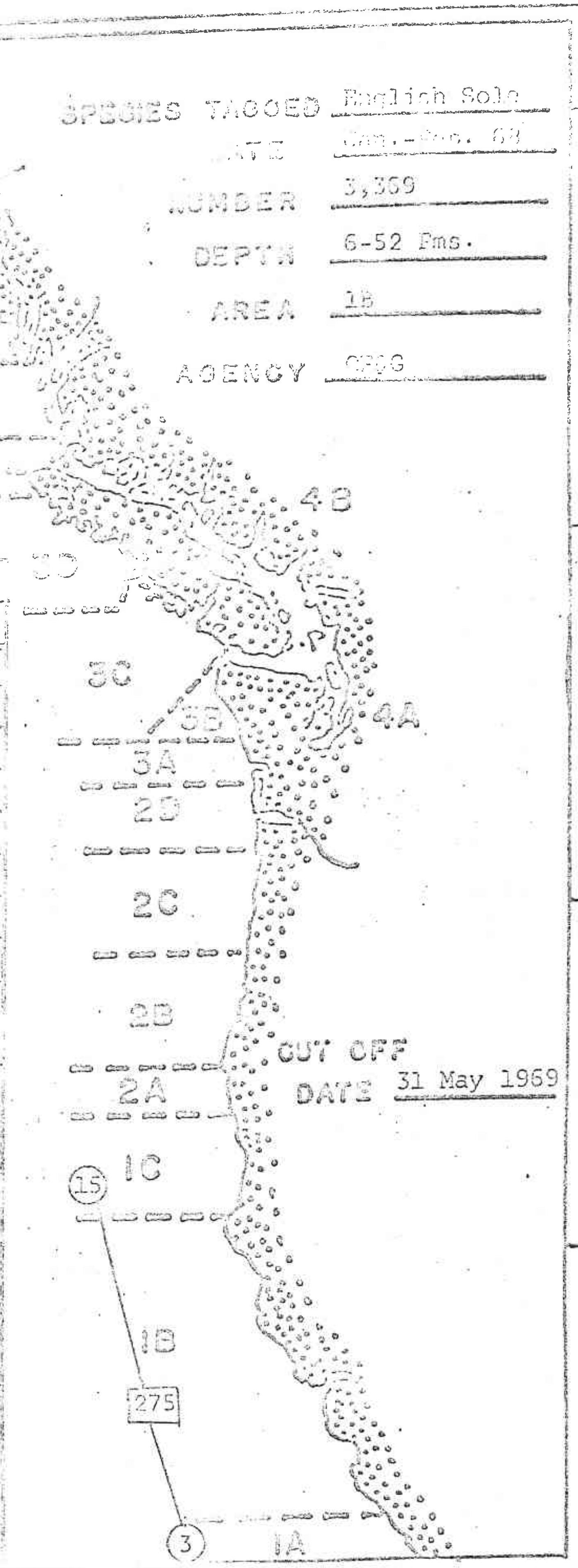
DATE Jan.-Dec. 68

NUMBER 3,369

DEPTH 6-52 Fms.

AREA 1B

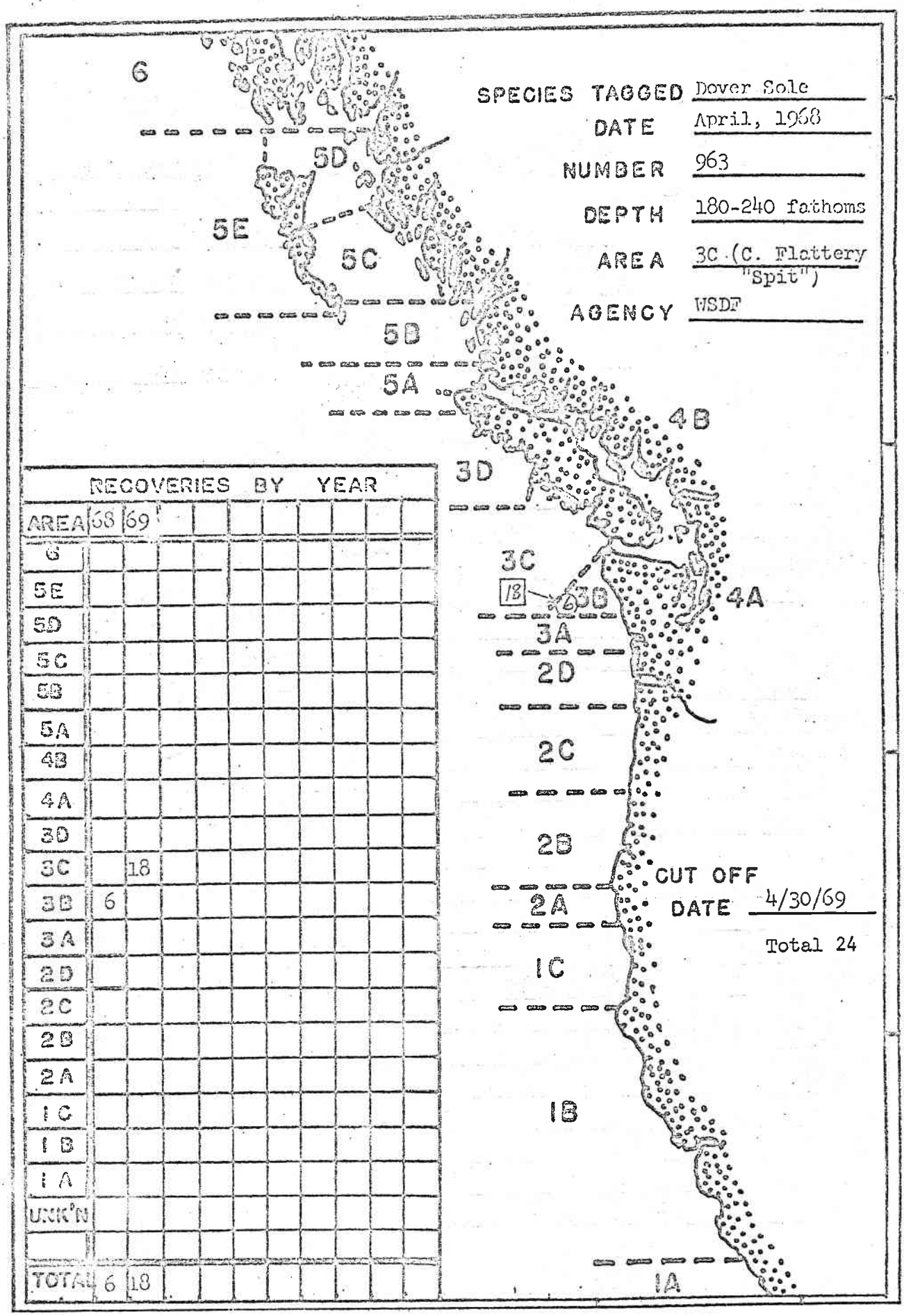
AGENCY OFCG



CUT OFF DATE 31 May 1969

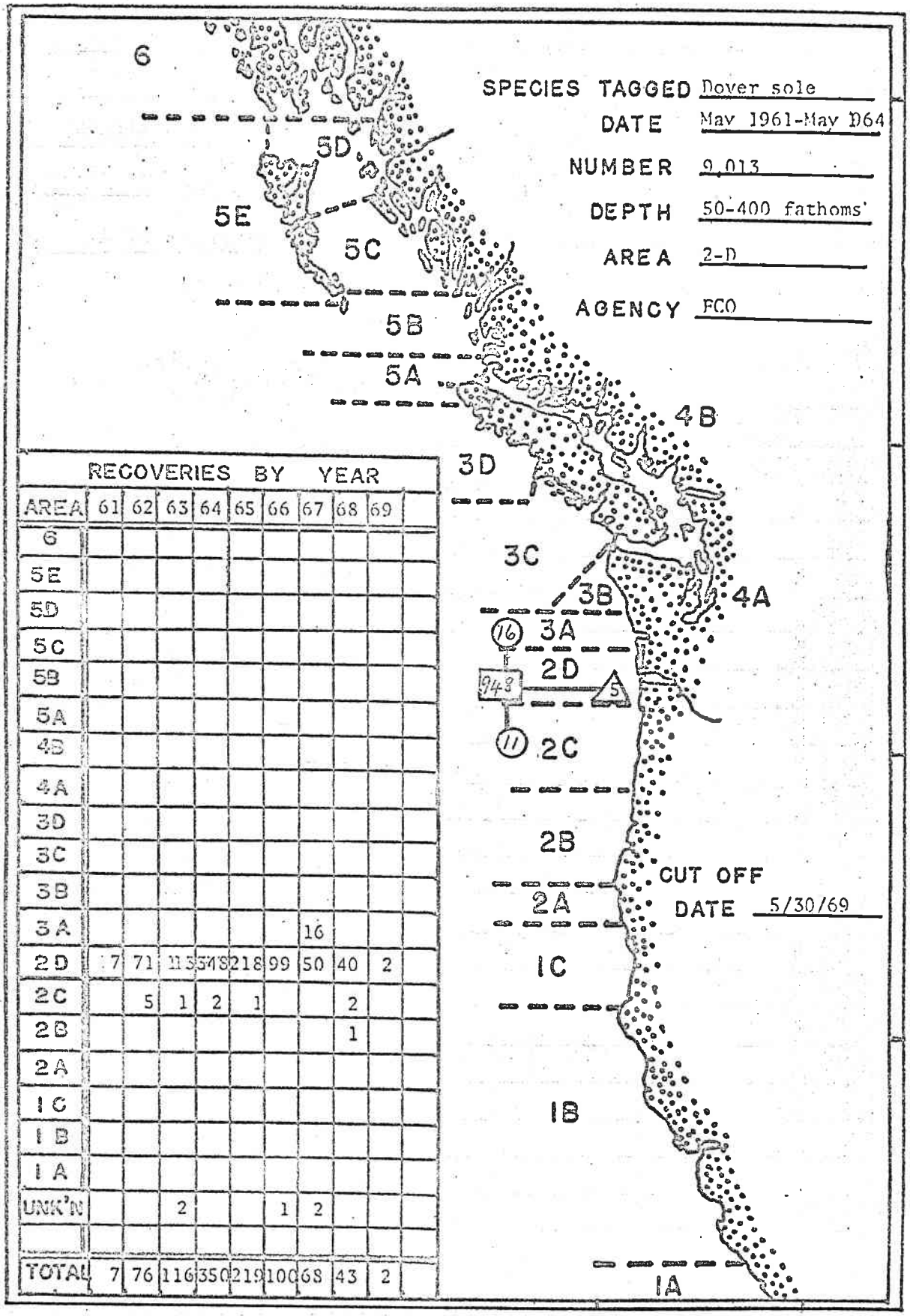
RECOVERIES BY [illegible]

	1	2							T
6									
5E									
5D									
5C									
5B									
5A									
4B									
[illegible]									
3D									
3C									
3B									
3A									
2D									
2C									
2B									
2A									
1C	1[illegible]	2							15
1B	21[illegible]	6[illegible]							275
1A	3								3
UNKN									
TOTAL	226	66							293



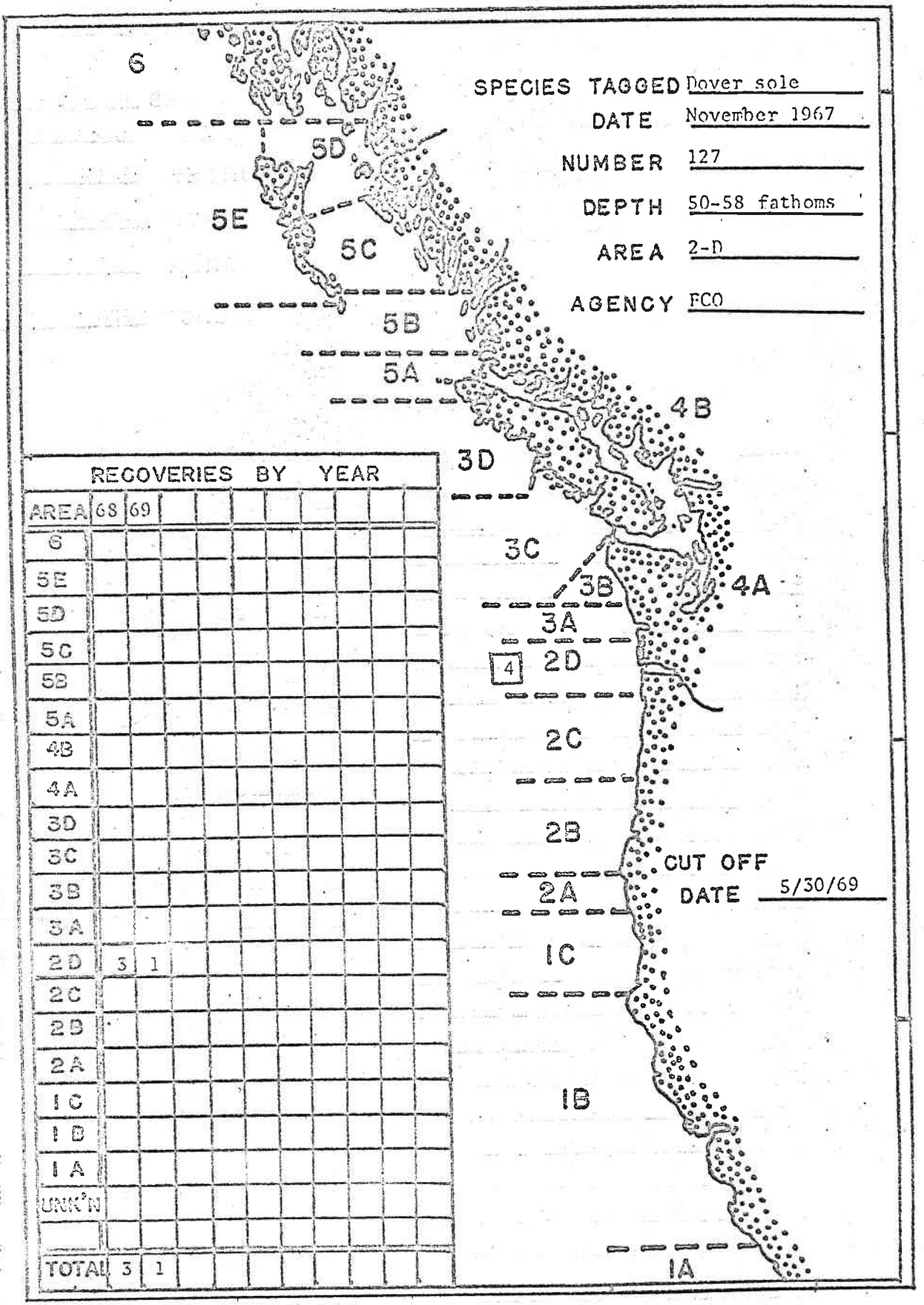
RECOVERIES BY YEAR

AREA	68	69
6		
5E		
5D		
5C		
5B		
5A		
4B		
4A		
3D		
3C		18
3B	6	
3A		
2D		
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N		
TOTAL	6	18



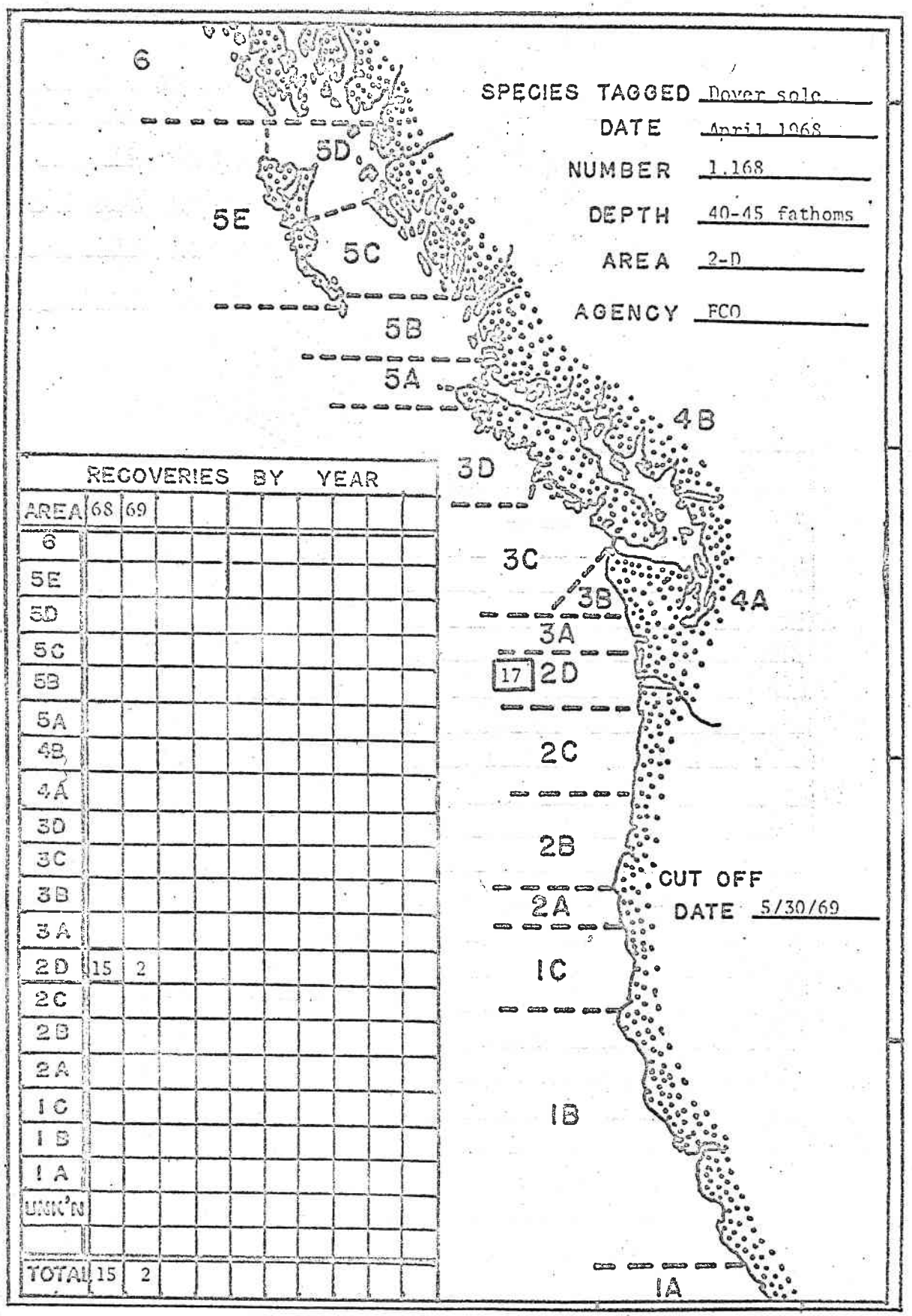
RECOVERIES BY YEAR

AREA	61	62	63	64	65	66	67	68	69	
6										
5E										
5D										
5C										
5B										
5A										
4B										
4A										
3D										
3C										
3B										
3A							16			
2D	7	71	113	351	218	99	50	40	2	
2C		5	1	2	1			2		
2B								1		
2A										
1C										
1B										
1A										
UNK'N			2			1	2			
TOTAL	7	76	116	350	219	100	68	43	2	



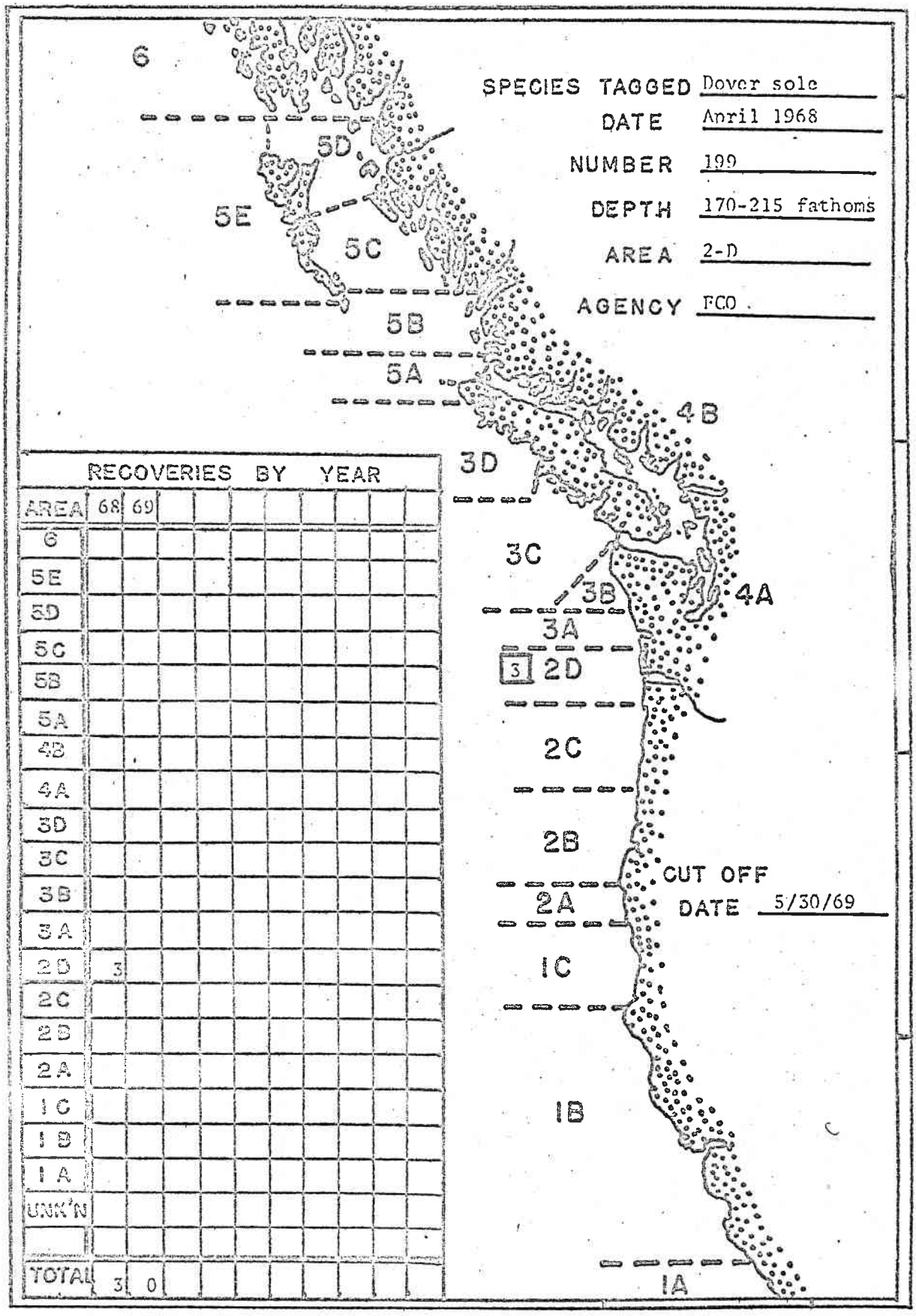
RECOVERIES BY YEAR

AREA	68	69
6		
5E		
5D		
5C		
5B		
5A		
4B		
4A		
3D		
3C		
3B		
3A		
2D	3	1
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N		
TOTAL	3	1



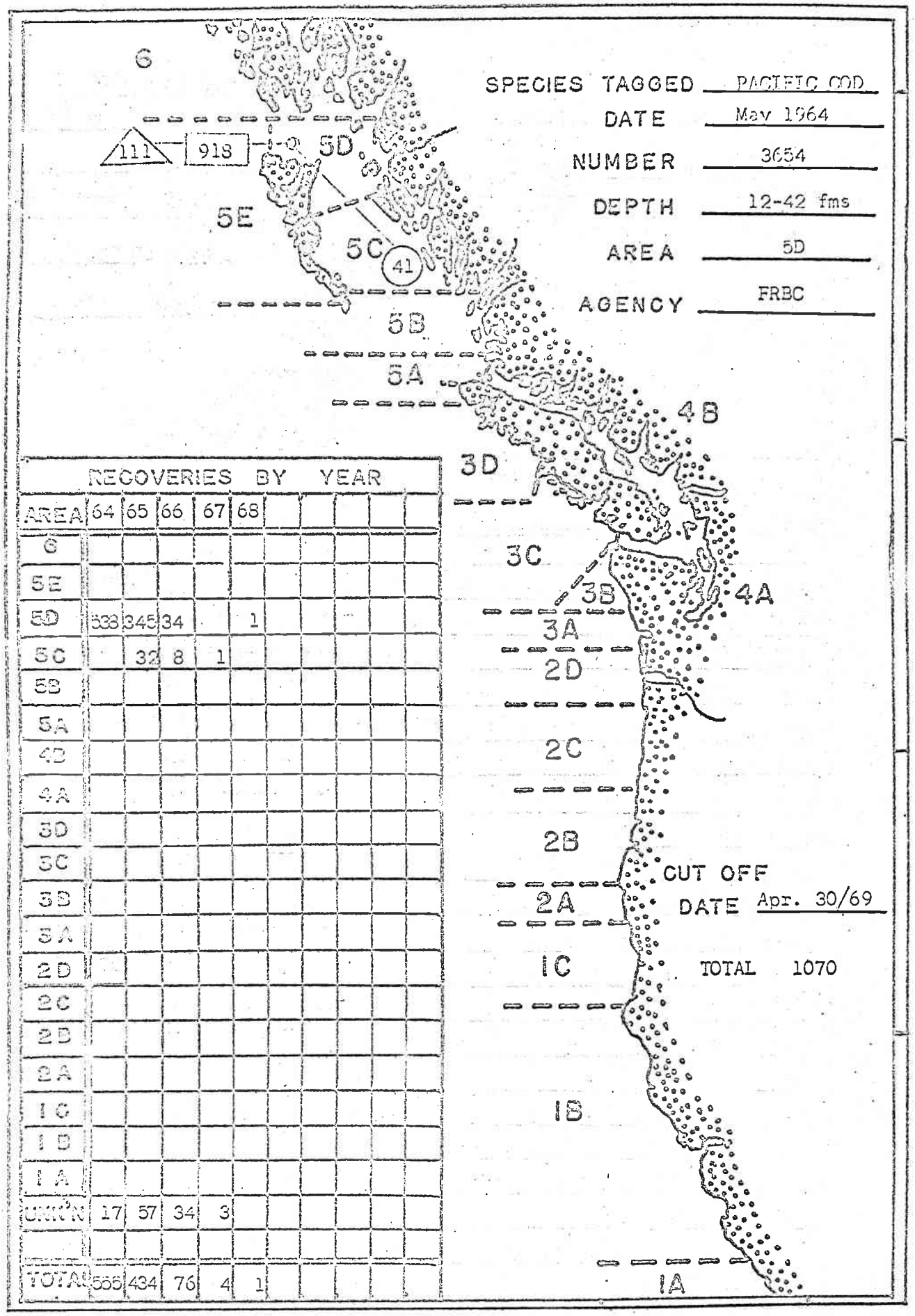
RECOVERIES BY YEAR

AREA	68	69
6		
5E		
5D		
5C		
5B		
5A		
4B		
4A		
3D		
3C		
3B		
3A		
2D	15	2
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N		
TOTAL	15	2



RECOVERIES BY YEAR

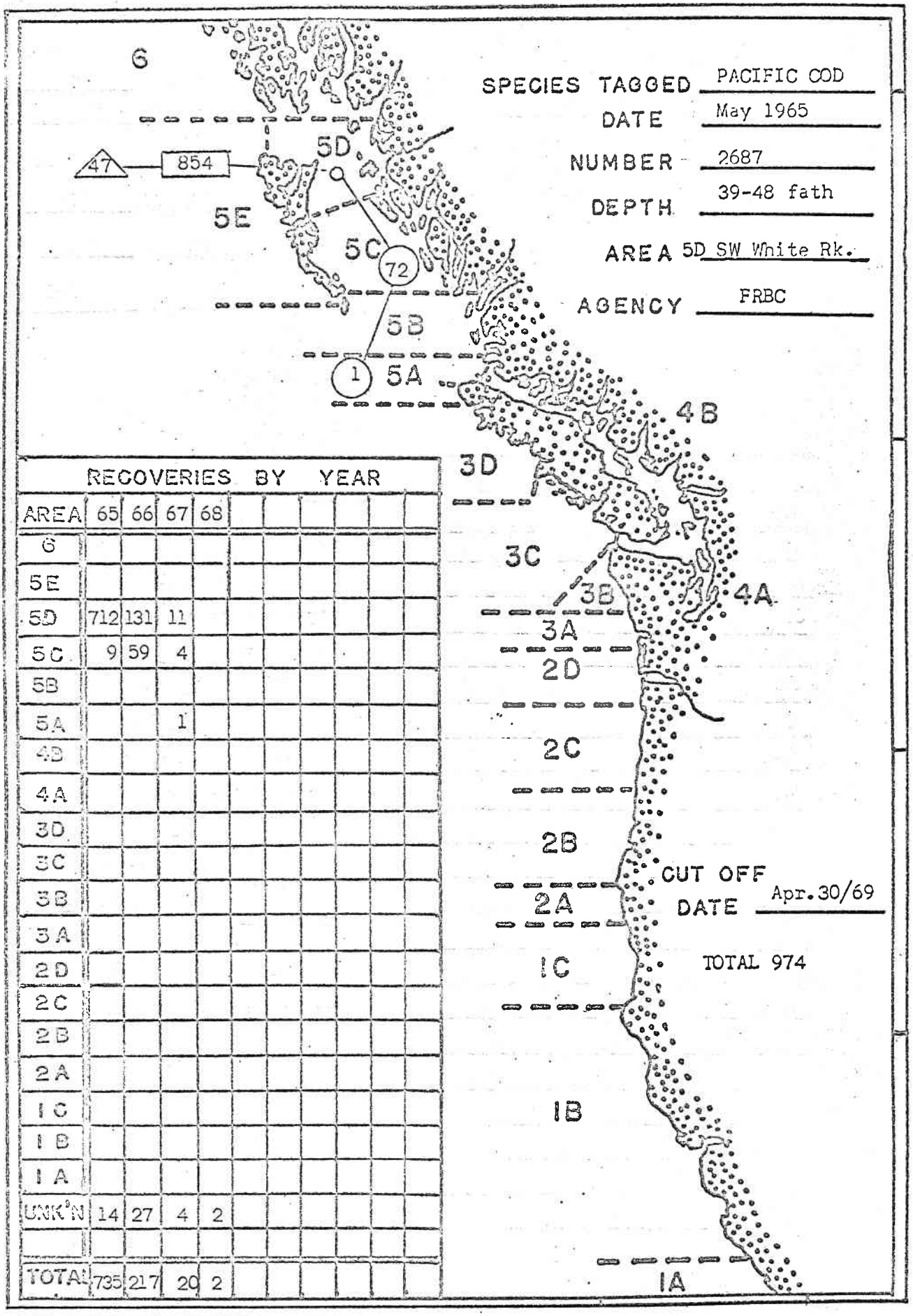
AREA	68	69
6		
5E		
5D		
5C		
5B		
5A		
4B		
4A		
3D		
3C		
3B		
3A		
2D	3	
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N		
TOTAL	3	0



SPECIES TAGGED: PACIFIC COD
DATE: May 1964
NUMBER: 3654
DEPTH: 12-42 fms
AREA: 5D
AGENCY: FRBC

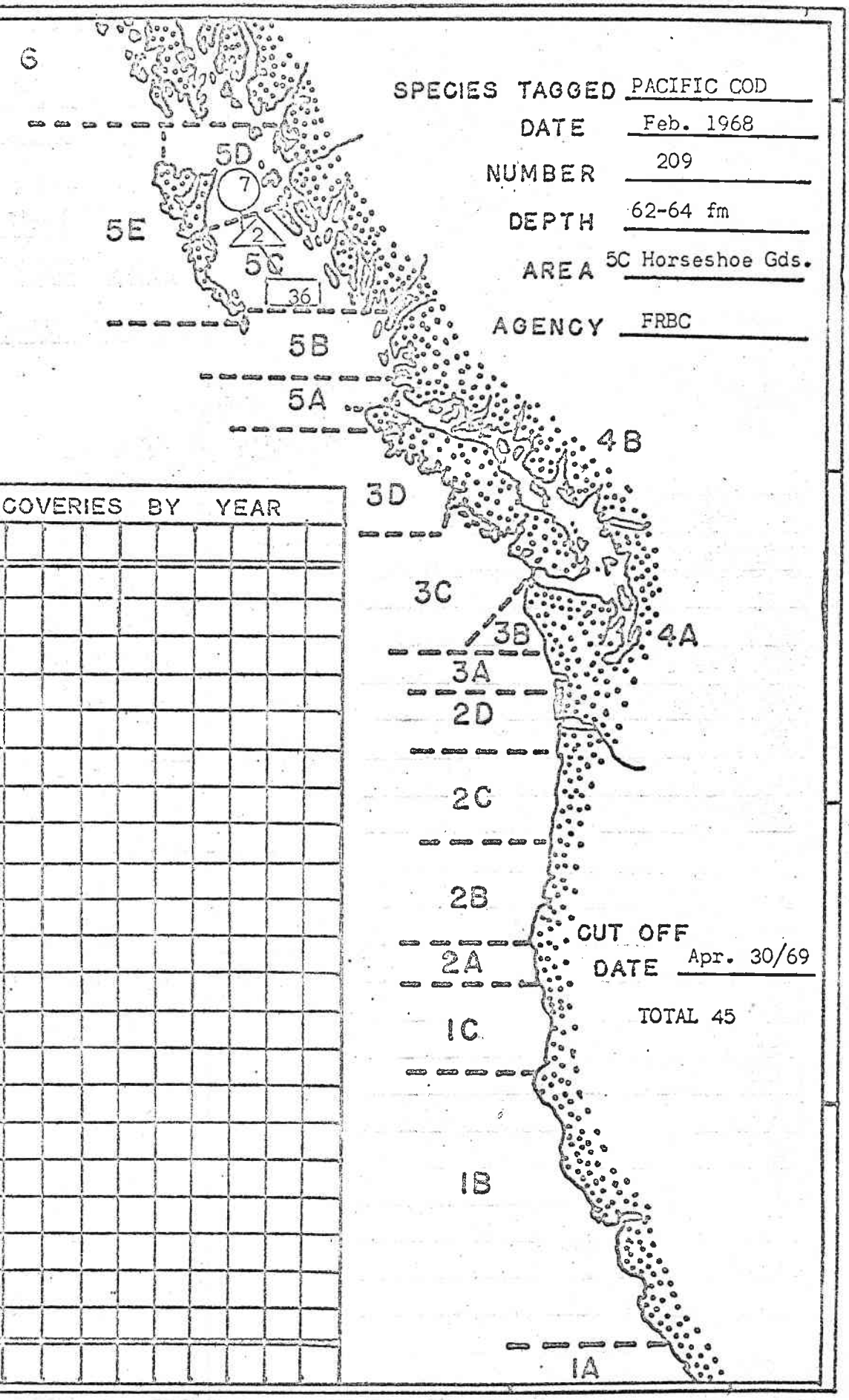
RECOVERIES BY YEAR

AREA	64	65	66	67	68					
6										
5E										
5D	538	345	34		1					
5C		32	8	1						
5B										
5A										
4B										
4A										
3D										
3C										
3B										
3A										
2D										
2C										
2B										
2A										
1C										
1B										
1A										
UNK'N	17	57	34	3						
TOTAL	555	434	76	4	1					



RECOVERIES BY YEAR

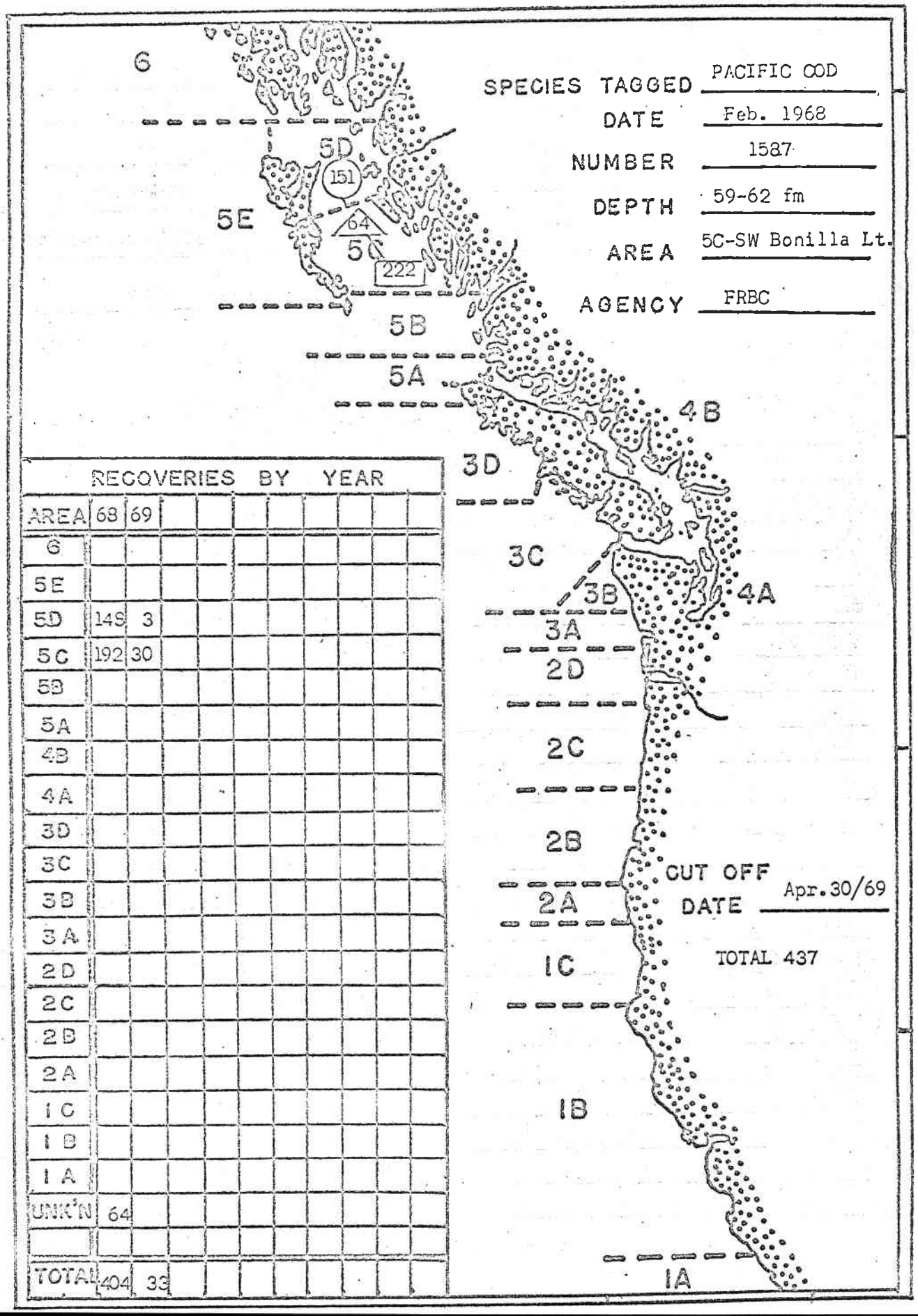
AREA	65	66	67	68
6				
5E				
5D	712	131	11	
5C	9	59	4	
5B				
5A			1	
4B				
4A				
3D				
3C				
3B				
3A				
2D				
2C				
2B				
2A				
1C				
1B				
1A				
UNK'N	14	27	4	2
TOTAL	735	217	20	2



SPECIES TAGGED PACIFIC COD
DATE Feb. 1968
NUMBER 209
DEPTH 62-64 fm
AREA 5C Horseshoe Gds.
AGENCY FRBC

RECOVERIES BY YEAR

AREA	68									
6										
5E										
5D	7									
5C	36									
5B										
5A										
4B										
4A										
3D										
3C										
3B										
3A										
2D										
2C										
2B										
2A										
1C										
1B										
1A										
UNK'N	2									
TOTAL	45									



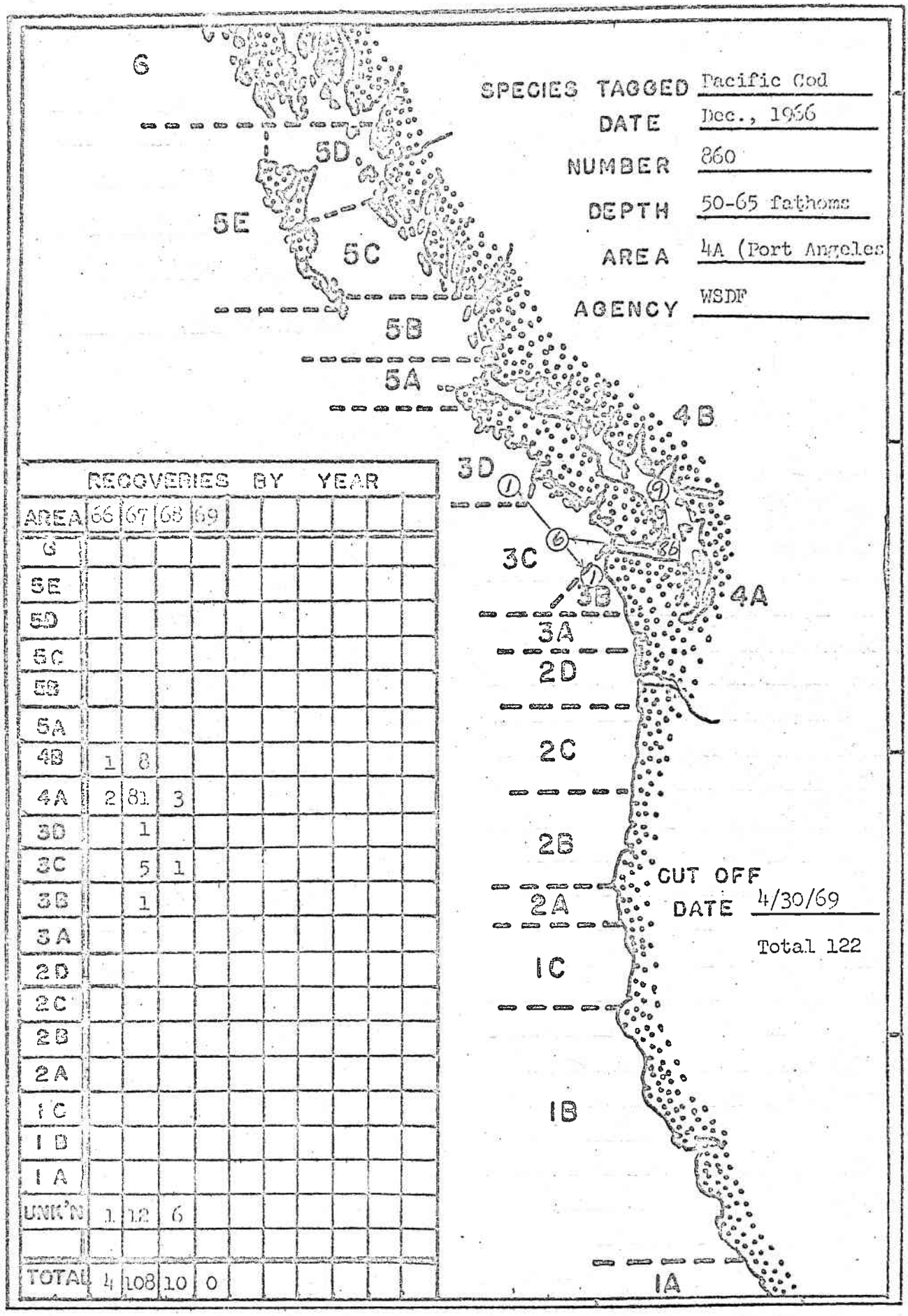
SPECIES TAGGED: PACIFIC COD
DATE: Feb. 1968
NUMBER: 1587
DEPTH: 59-62 fm
AREA: 5C-SW Bonilla Lt.
AGENCY: FRBC

CUT OFF DATE: Apr. 30/69

TOTAL 437

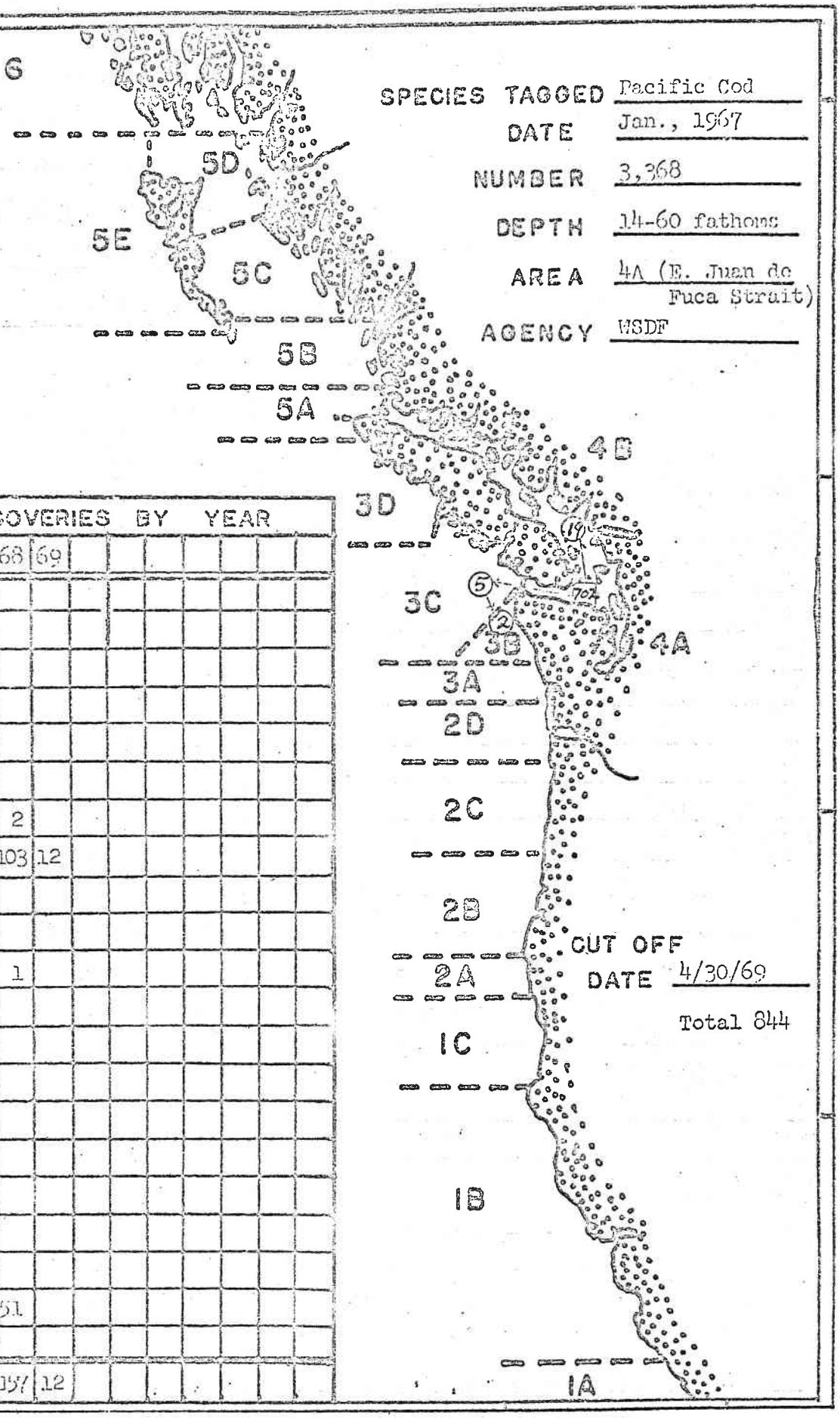
RECOVERIES BY YEAR

AREA	68	69
6		
5E		
5D	149	3
5C	192	30
5B		
5A		
4B		
4A		
3D		
3C		
3B		
3A		
2D		
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N	64	
TOTAL	404	33



RECOVERIES BY YEAR

AREA	66	67	68	69
6				
5E				
5D				
5C				
5B				
5A				
4B	1	8		
4A	2	81	3	
3D		1		
3C		5	1	
3B		1		
3A				
2D				
2C				
2B				
2A				
1C				
1B				
1A				
UNK'N	1	12	6	
TOTAL	4	108	10	0



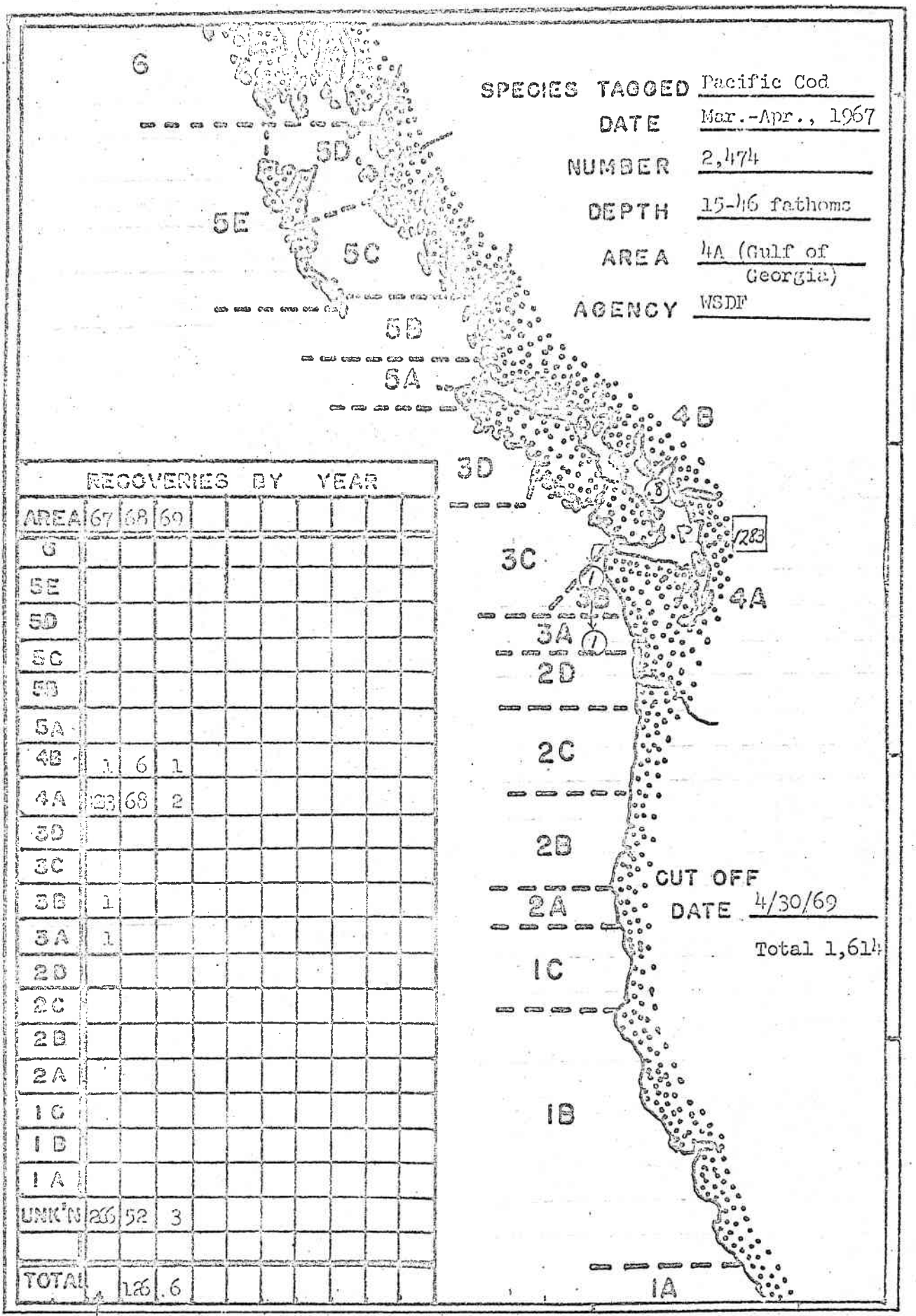
SPECIES TAGGED: Pacific Cod
DATE: Jan., 1967
NUMBER: 3,368
DEPTH: 14-60 fathoms
AREA: 4A (E. Juan de Fuca Strait)
AGENCY: WSDF

RECOVERIES BY YEAR

AREA	67	68	69							
6										
5E										
5D										
5C										
5B										
5A										
4B	17	2								
4A	587	103	12							
3D										
3C	5									
3B	1	1								
3A										
2D										
2C										
2B										
2A										
1C										
1B										
1A										
UNK'N	69	51								
TOTAL	679	157	12							

CUT OFF DATE: 4/30/69

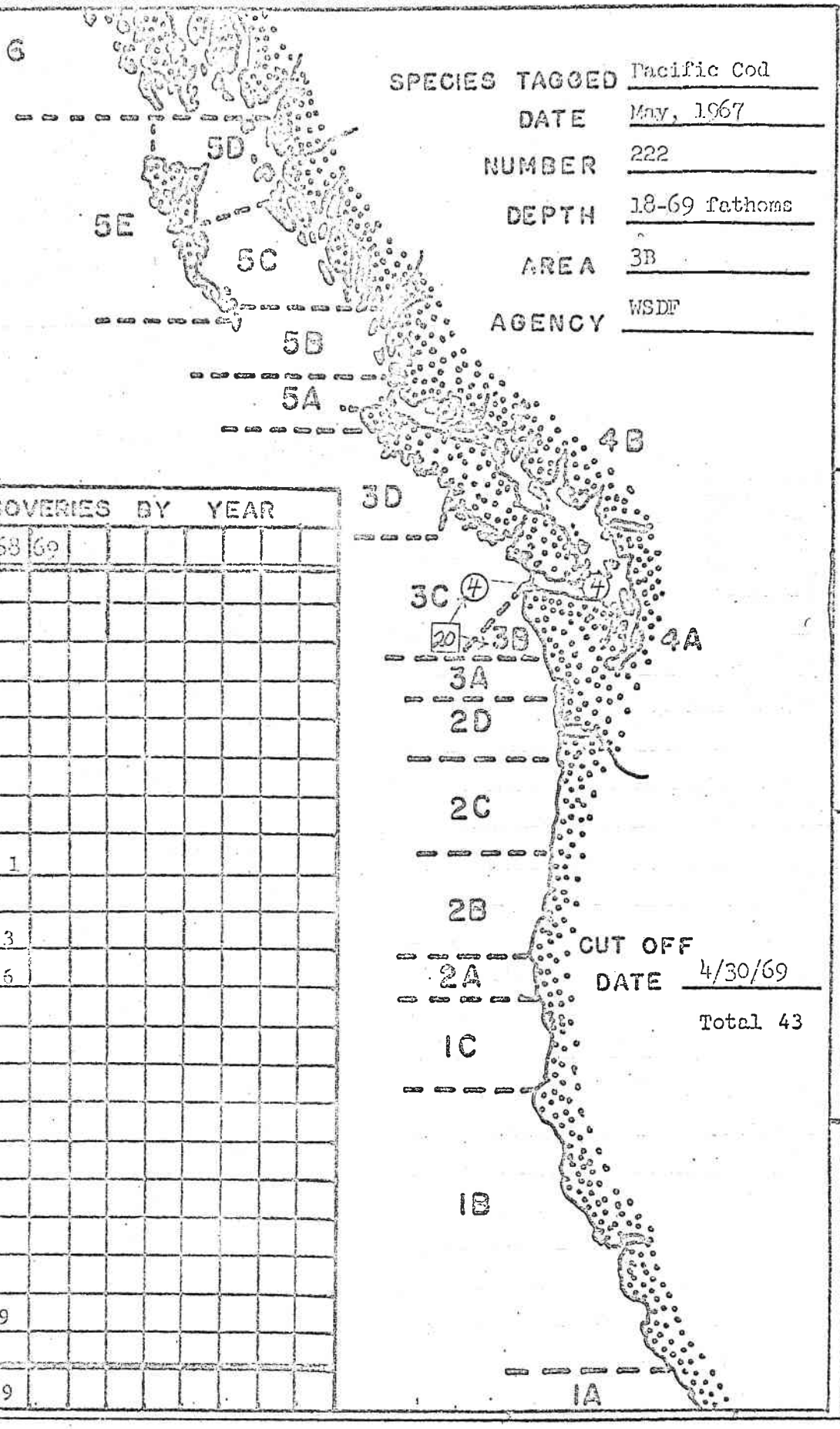
Total 844



RECOVERIES BY YEAR

AREA	67	68	69							
6										
5E										
5D										
5C										
5B										
5A										
4B	1	6	1							
4A	33	68	2							
3D										
3C										
3B	1									
3A	1									
2D										
2C										
2B										
2A										
1C										
1B										
1A										
UNK'N	266	52	3							
TOTAL		126	6							

1,482



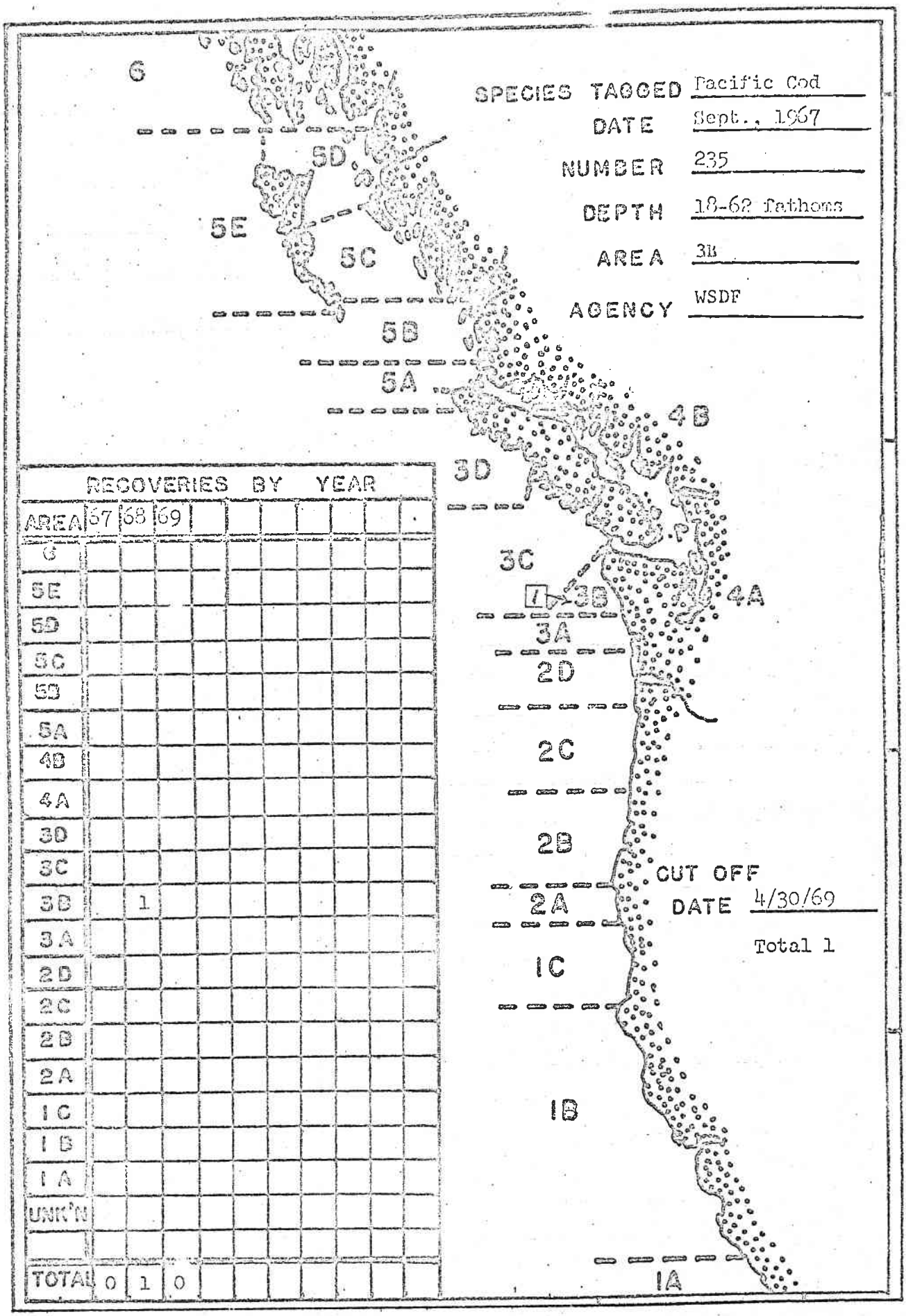
SPECIES TAGGED: Pacific Cod
DATE: May, 1967
NUMBER: 222
DEPTH: 18-69 fathoms
AREA: 3B
AGENCY: WSDF

RECOVERIES BY YEAR

AREA	67	68	69
6			
5E			
5D			
5C			
5B			
5A			
4B			
4A	3	1	
3D			
3C	1	3	
3B	14	6	
3A			
2D			
2C			
2B			
2A			
1C			
1B			
1A			
UNK'N	6	9	
TOTAL	24	19	

CUT OFF DATE 4/30/69

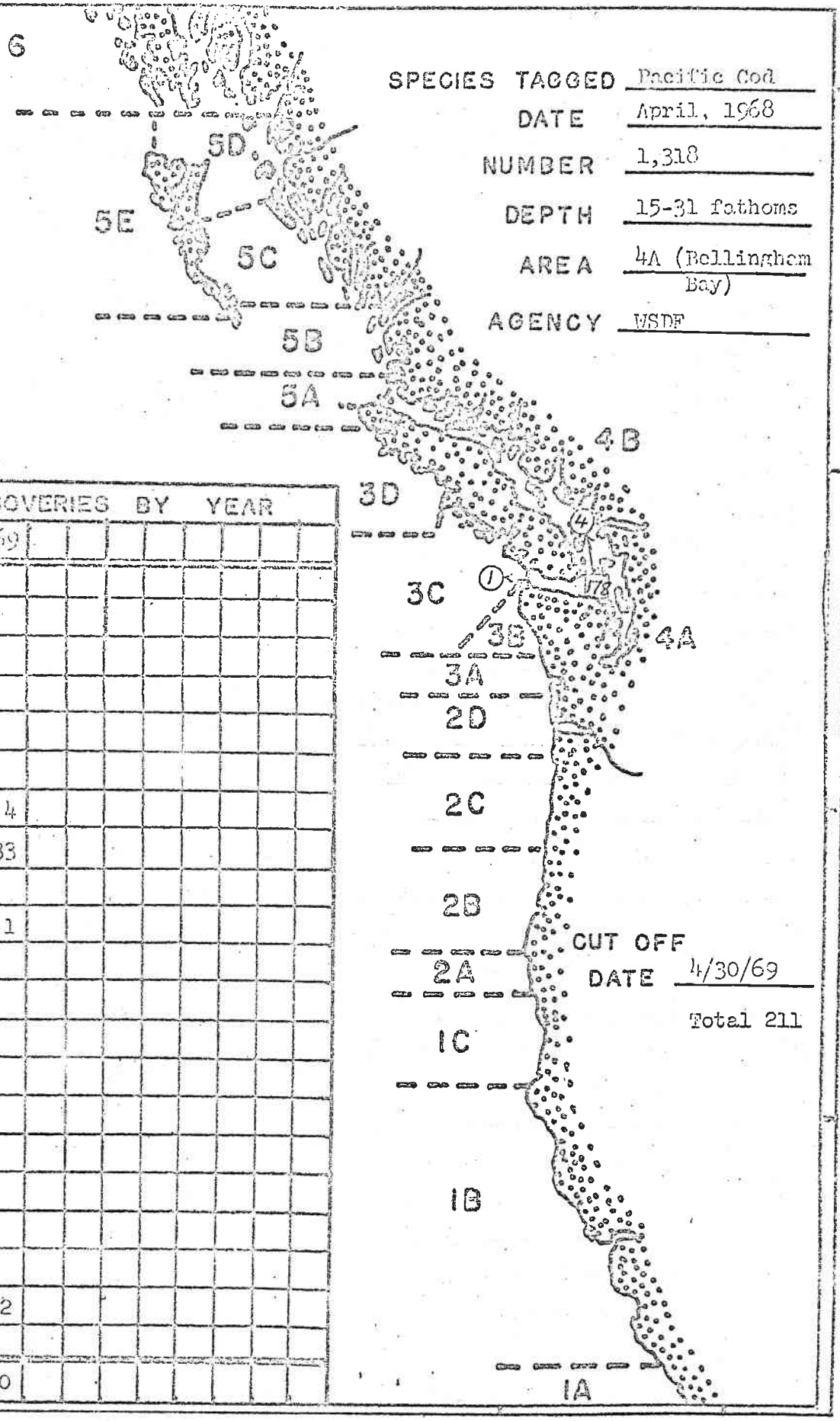
Total 43



RECOVERIES BY YEAR

AREA	67	68	69
6			
5E			
5D			
5C			
5B			
5A			
4B			
4A			
3D			
3C			
3B		1	
3A			
2D			
2C			
2B			
2A			
1C			
1B			
1A			
UNK'N			
TOTAL	0	1	0

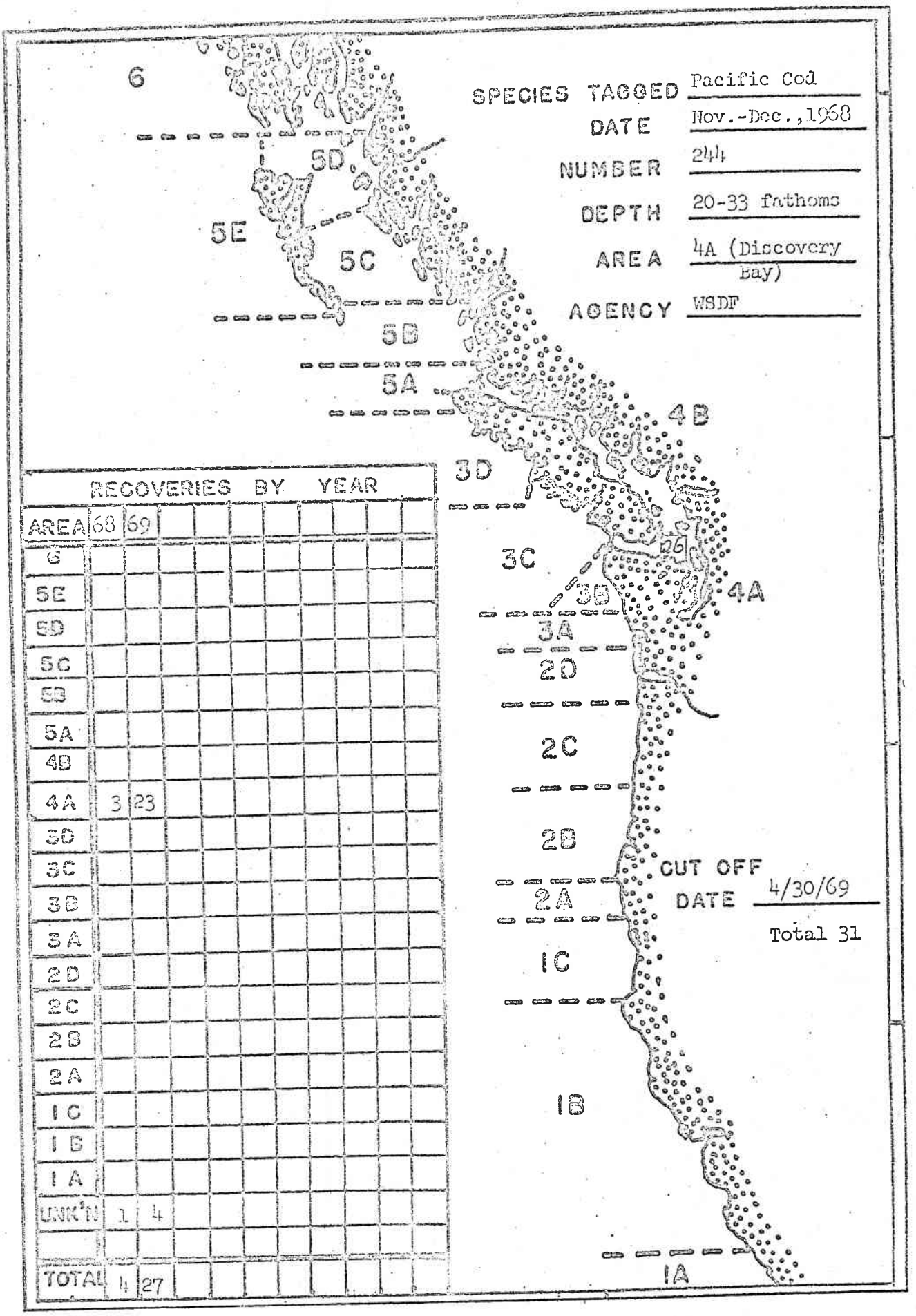
SPECIES TAGGED: Pacific Cod
DATE: April, 1968
NUMBER: 1,318
DEPTH: 15-31 fathoms
AREA: 4A (Bellingham Bay)
AGENCY: WSDF



Total 211

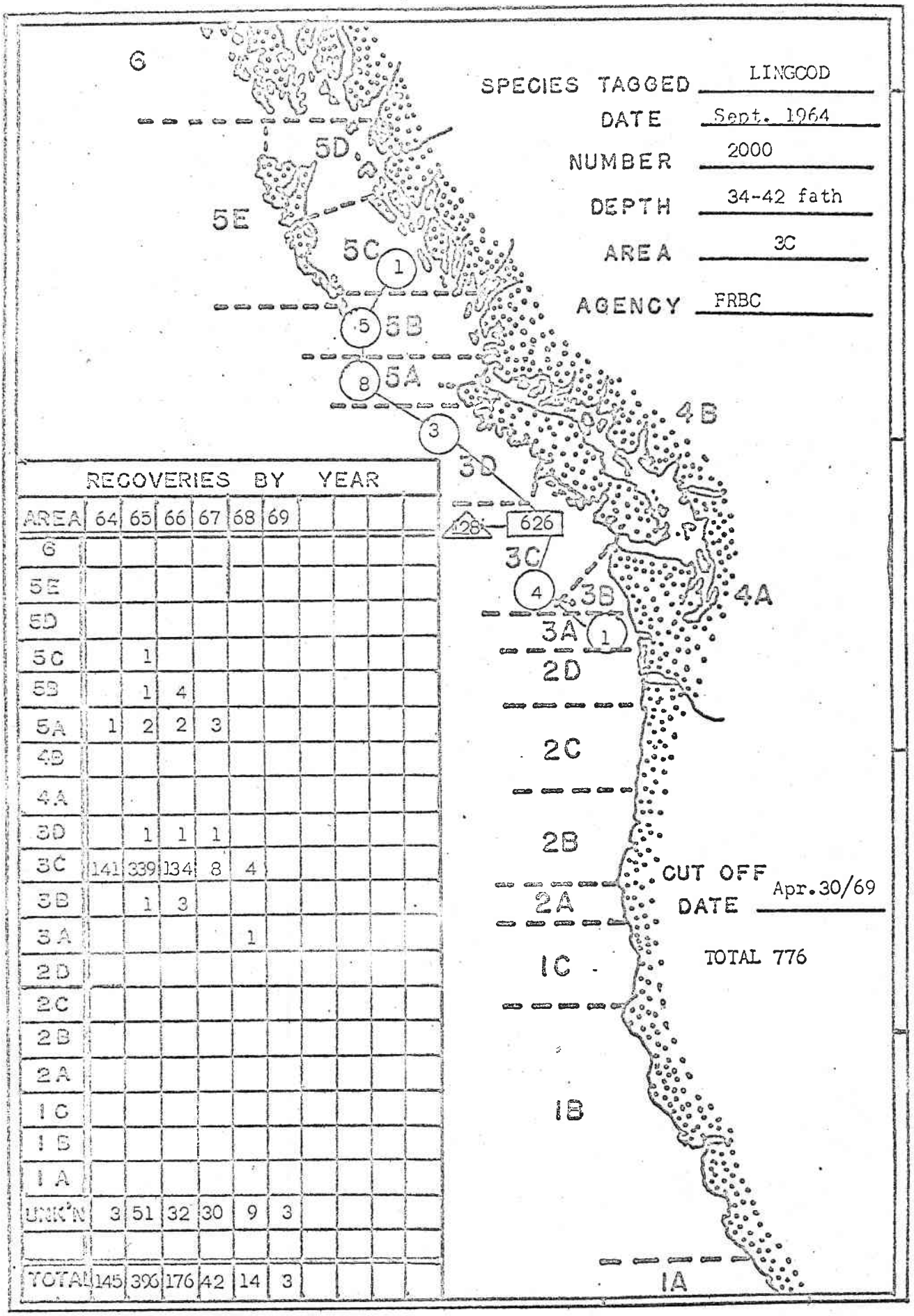
RECOVERIES BY YEAR

AREA	68	69
6		
5E		
5D		
5C		
5B		
5A		
4B		4
4A	145	33
3D		
3C		1
3B		
3A		
2D		
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N	16	12
TOTAL	161	50



RECOVERIES BY YEAR

AREA	68	69
6		
5E		
5D		
5C		
5B		
5A		
4B		
4A	3	23
3D		
3C		
3B		
3A		
2D		
2C		
2B		
2A		
1C		
1B		
1A		
UNK'N	1	4
TOTAL	4	27



RECOVERIES BY YEAR

AREA	64	65	66	67	68	69				
6										
5E										
5D										
5C		1								
5B		1	4							
5A	1	2	2	3						
4B										
4A										
3D		1	1	1						
3C	141	339	134	8	4					
3B		1	3							
3A					1					
2D										
2C										
2B										
2A										
1C										
1B										
1A										
UNK'N	3	51	32	30	9	3				
TOTAL	145	396	176	42	14	3				

DISTRIBUTION OF MINUTES, TECHNICAL SUB-COMMITTEE

		Total
Technical Sub-Committee		
California	- T. Jow (2)	2
Oregon	- J. Meehan, R. Loeffel	2
Washington	- D. Kauffman, G. DiDonato	2
Alaska	- R. Rickey (2)	2
Canada	- R. D. Humphreys, M. P. Shepard	2
Trawl Fishery Committee		
Canada	- M. P. Houghton (4, 2 for Ottawa)	4
U.S.	- L. Verhoeven (4, 2 for U.S. Gov't)	4
Advisors and others		
Canada	- K. S. Ketchen, S. J. Westrheim, HQ, FRB Ottawa (2)	4
U.S.	- G. R. Arnett - Calif. Fish and Game (2)	2
	- R. W. Schoning - Oregon	1
	- T. E. Kruse - Oregon	1
	- T. Tollefson - Washington	2
Spare		5
		33