1945
NEW ZEALAND

MARINE DEPARTMENT

ANNUAL REPORT FOR THE YEAR 1944–45

Presented to both Houses of the General Assembly by Command of His Excellency

YOUR EXCELLENCY,— Marine Department, Wellington, 16th August, 1945.

I do myself the honour to transmit for Your Excellency's information the report of the Marine Department for the financial year ended the 31st March last.

I have, &c.,
JAS. O'BRIEN,
Minister of Marine.

His Excellency the Governor-General of the Dominion of New Zealand.

REPORT

THE SECRETARY, MARINE DEPARTMENT, to the Hon. the MINISTER OF MARINE.

SIR,— Marine Department, Wellington, 15th August, 1945.

I have the honour to submit the annual report on the activities of the Marine Department for the year ended 31st March, 1945.

Another war year, difficult in many phases, has been the lot of the Marine Department for the period under review. The arrival on our shores of vessels from all nations, some hitherto almost unknown, and the assistance provided to the Allied Nations by way of food, ship construction, and ship repairs have been factors creating a position which required and gained the fullest co-operation of shipping companies, Harbour Boards, engineering executives, and the staff of the Department.

The improved war situation has made possible the relaxation of some restrictions. Certain modifications have been possible in regard to wartime safety measures for shipping, survey of ships, and in the matter of certain navigational aids. Some of the major ports (excluding the four main ports) have benefited by the allocation of overseas vessels for loading purposes, thus materially improving the finances of the Boards, concerned and obviating the necessity for application to Government for further financial assistance. Other Harbour Boards affected by wartime restriction of shipping have had their cases reviewed by Government during the year and have been assisted financially to overcome the deficit caused by war conditions.

The problem of Greymouth and Westport Harbours—in other words, the ensuring of sufficient coal supplies throughout New Zealand—has received full consideration throughout the year from the points of view of both immediate and long-term improvements to these harbours to ensure that depth of water at these bar harbours will in future not jeopardize the supply of coal so essential to North Island industry and to domestic users.

The shipbuilding efforts of the Department are separately dealt with in this report. In addition to ship construction, the successful functioning of the Ship Repairs Costing Service is a feature of the year's work. This service was instituted early in 1944 to ensure (1) a speedy turn-round of vessels, (2) that work only of an urgent nature was carried out, (3) that all work performed was properly supervised and costed, and (4) that labour and materials were made available when required. Ship construction, fortunately, provided a labour pool for transfer to ship repairs in emergency. Success has attended the Department's efforts to standardize costs and procedure. Repairs totalling £576,594 have been costed and authorized for payment during the year ended 31st March, 1945. Apart from the resultant saving in cost, the efficiency and expediency of our ship-repair operations have been favourably commented on by the Ministry of War Transport, London, particularly in regard to a vessel which required five refrigerated holds completely retimbered and reinsulated.

The rehabilitation of New Zealand seamen from ports all over the world and the provision of comforts in New Zealand ports for British seamen have been features of the year's activities. The Department's thanks are due to the Seamen's Union, the Seamen's Institute, the British Sailors' Society, the Catholic Seamen's Institute, and other such organizations for assistance and co-operation in this regard.

Lighthouses

The restrictions on navigational aids have been somewhat reduced during the year to the advantage of coastal shipping. No new feature has been introduced, but access roads have been given attention and amenities improved as far as possible in line with the Department's policy. Automatic lights were re-exhibited during the year at Honeycomb, North Cape, St. Anne's Point, Gable End, Matakaoa, and Pearl Island. The light at Oamaru South Head was electrified, also the two leading lights in Tory Channel and the light at Waipapapa Point. Tribute has previously been paid to the splendid war work displayed by our lightkeepers, and the past year has required no less exacting co-operation and attention to duty. The most important works carried out during the year were as follows:—

Cape Reinga.—Construction of 30,000-gallon water-reservoir with pump.

Cape Brett.—Improvements and repairs to dwellings, including hot-water service.

Kaipara Head.—Alteration to automatic light.

Cuvier Island.—General repairs and improvements to buildings, including hot-water service.

Manukau South Head.—Removal and re-erection of tower.

Portland Island.—Modernization of dwellings, including hot-water service, construction of two 10,000-gallon water-tanks, and improvements to access road.

Castlepoint.—Construction of wind-break fence and repairs to track to tower.

Baring Head.—Road maintenance arranged with County Council; septic tank and drainage system installed at cottages.

French Pass.—General repairs to dwellings and provision of hot-water service.

Stephens Island.—Repairs to tram track and emergency landing erected.

Cape Campbell.—Erection of garage for truck and office building.

Kahurangi Point.—Electrification of this light is in progress.

Godley Head.—Electrification is in hand.

Akaroa.—General repairs and renovations and installation of fuel tanks.

Waipapapa Point.—Construction of two 20,000-gallon water-tanks; electrification completed.

Dog Island.—Provision of 10,000-gallon water-tank and general repairs.

Puysegur Point.—Provision of 30,000-gallon reservoir and pump, installation of revolving lens and standby generator.

Nautical

The demand for Admiralty charts has again been abnormal, owing, no doubt, to additional shipping in the Pacific area. The supply of charts has been limited to those required for purely navigational purposes.

The forty-third edition of the "New Zealand Nautical Almanac" was published, as usual, in two parts. Here again the demand during the year was abnormal, but navigational orders were met in all cases. Notices to mariners giving information to all seafarers were again published and distributed throughout the year. Our shipping officers in main ports, and Customs officers acting as agents for the Department in smaller ports, have again rendered excellent service to shipping generally by the expeditious provision of personnel, the arranging of return to home ports of members of ships' crews, and the provision of subsistence or medical treatment to British seamen awaiting return. Government has also recently approved the issue of the 1939–43 star to those members of the Mercantile Marine who have served at least six months in the home or overseas trade and have made at least one voyage during that period beyond New Zealand coastal waters. At the time of going to press arrangements for issue of the ribbon were in train. War-risk gratuity payable to all members of the Mercantile Marine on New Zealand articles has been credited to National Savings Accounts of the individual seamen, thus ensuring payment of the total amount of gratuity to all eligible seamen at the end of the war or at such stage that they are obliged to give up a seafaring profession.

Engagement of Seamen

This service has been maintained. A record of seamen applying for work is kept for the purpose of filling vacancies.

Sick and Injured Seamen

The total amount paid by shipowners to sick and injured seamen, under the provisions of the Shipping and Seamen Act, 1908, and amendments, was £11,606 10s. 4d., as against £15,064 1s. 2d. for the previous year, a decrease of £3,457 10s. 10d.

Registration of Shipping

On the 31st December, 1944, there were on the register of vessels in the Dominion 45 sailing-vessels of 3,553 net tons register, 127 steamers of 61,900 net tons register, and 280 motor-vessels of 18,652 net tons register, as compared with 45 sailing-vessels of 3,553 net tons register, 130 steamers of 62,264 net tons register, and 280 motor-vessels of 18,342 net tons register at the end of the previous year.

The number of seamen employed on board was 2,308, as compared with 2,506 for the year 1943.

Government Steamer "Matai"

Early in 1945 the Government steamer was released from naval service and has since been engaged on cable lifting and laying in the Cook and Foveaux Straits areas. The return of this vessel should assist in the servicing of outlying light stations, and the vessel will be available for any urgent Government shipping work.

Prosecutions

Prosecutions during the year under the various Acts administered by the Department were 26, comprising 21 for breaches of the Fisheries Act, 1 the Inspection of Machinery Act, and 4 the Shipping and Seamen Act.

School of Navigation

Early in 1944 Government took over the School of Navigation at Auckland previously operated by Captain W. J. Keane, whose services were acquired by Navy some time ago. The lack of tuition to enable members of ships' crews to qualify by examination for promotion to officered rank and for junior officers to improve their status was proving an obstacle, and the taking-over of the school by the Department has been beneficial to operatives in this profession. During the year ended 31st December, 1944, 58 candidates attended the school for tuition as follows: 6 Masters Foreign-going, 9 First Mates Foreign-going, 19 Second Mates Foreign-going, 7 Masters Home Trade, 4 Mates Home-trade, 3 Yachtmasters, 5 Masters 25-ton Cargo Vessels, 3 Masters River Vessels, 1 Master Fishing-vessel, and 1 Master Harbour Vessel.

Enrolments in the early part of 1945 necessitated the appointment of an additional tutor, and there is no doubt that the re-establishment of the school is of great benefit to shipping interests. The fees charged are identical with those previously operative, and are as follows:—

	£	s.	d.
Foreign-going—			
Master	12	12	0
Mate	11	11	0
Second Mate	10	10	0
Home-trade—			
Master	10	10	0
Mate	9	9	0
Second Mate	7	7	0
Restricted Limits: Master	7	7	0
25-ton Cargo-vessel: Master	7	7	0
Fishing-vessel: Master	7	7	0
Compass Syllabus	7	7	0
Yacht Master	10	10	0

It is interesting to note that a number of the candidates during the past year have received the assistance of the Rehabilitation Department as returned servicemen. As the school consolidates, thought will be given to progress to correspondence courses, evening classes, and pre-vocational training as opportunity offers.

Harbours

The control of harbours at Dargaville, Picton, and Westport has continued as the responsibility of the Marine Department. At Dargaville the harbour services have been maintained in good order, and at Picton a satisfactory service to shipping has been provided, including the maintenance of lights in the Cook Strait area, a hazardous undertaking at any time. At Westport the maintenance of satisfactory conditions for ingress and egress of vessels has again proved a difficulty.

Depth of water on the bar at the Westport entrance is the governing factor in the operation of the port, and as at the commencement of the year which is now to be reviewed the depth available for working vessels was very satisfactory, and, taken on monthly mean, the depth of 23 ft. at high water for May had been exceeded on two months only during the preceding five years.

Such satisfactory conditions, however, did not continue consistently throughout the year, though in January, 1945, we experienced the high average of high-water depths for the month of just on 24 ft., the best experienced for over seven years previously.

As at the close of the year—*i.e.*, for March, 1945—the monthly mean had fallen somewhat to 22 ft. 3 in., though this was still a satisfactory working depth given fair conditions otherwise.

For six months in mid-year, however, the depths at the entrance were moderate only, though even then for the year the average of monthly means, at 21 ft. 4 in., was rather better than the 20 ft. 8 in. recorded for the previous year.

On the other hand, the climatological conditions during the year were unusually bad, consistently so to such an extent in fact as to appreciably offset the better average depths of water which obtained as against the previous year, for instance, and so had a decidedly unfavourable reflex on the working of the port by shipping.

This circumstance is more simply explained in that if greater depth of water obtains, but, due to weather conditions, greater sea swells result on the bar at the same time, then advantage of such greater depth of water is nullified by the greater swells, which must be allowed for by restricting the draught (and therefore carrying-capacity) to which vessels can be loaded to enable them to negotiate the bar with measure of safety.

Sea conditions in excess of "light" swells are those which have major influence on bar working conditions, both in respect to shipping and in respect to the operations of the dredges which are worked in the river and on the bar in endeavour to maintain satisfactory working depths. Just as seas in excess of "light," according to extent "in excess of light," affect the efficiency of vessels carrying cargoes from the port, so are the dredges—efficient operation of which is so necessary to the maintenance of satisfactory working depths—hampered in such necessary work.

The year under review, from point of view of climatological conditions, was the worst experienced for many years. Summer, as it is known, was not experienced on the West Coast this last year. Weather of a northerly aspect predominated, and from such aspect rain and seas largely occur.

For the year rain totalled 92·13 in., falling on 235 days. Such total was the highest for many years; was fifty per cent. in excess of the total fall during the preceding year, and unfavourably compares with the mean of 75 in. over the preceding seven years. Apart then from bar conditions, with, on the average throughout the year, of 20 days per month with rain, such consistently wet conditions greatly hindered loading of vessels, with consequently noticeable delays in despatch on many occasions.

On no less than 227 days during the year sea conditions on the bar were in excess of light swells, as against similar circumstances on 186 days only during the preceding year, an appreciable factor which materially detracted from the better depths of water which otherwise obtained during last year as against the previous year. As further instance, we had last year 98 days of rough to very rough seas, as against 71 days the previous year.

The reflex on dredging operations of the circumstances described in the foregoing was that the suction dredger "Eileen Ward," the prime vessel of the Department's dredging fleet, was only able to lift from the bar during the year some 352,000 cubic yards of material, as compared to 509,000 cubic yards the previous year. However, early in the year another dredge crew was added to the Department's staff, and the smaller bar dredger "Rubi Seddon" was operated in supplementation, and assisted the "Eileen Ward" by lifting some 138,000 cubic yards from the entrance area, making a total for the year of 490,000 cubic yards, as against 560,000 cubic yards the previous year, and a total exceeded only on two occasions during the previous thirteen years.

On the other hand, the dredgers mentioned, on all other occasions when they were able to, worked in the river fairway, and lifted together therefrom just on an additional 200,000 cubic yards of dredgings, together with some 76,000 cubic yards lifted by the bucket dredger "Maui" from the upper river fairway.

The total quantity dredged from the harbour and bar areas during the year was 765,000 cubic yards, as compared with 675,000 cubic yards during 1943–44, and again, except for one occasion, the highest yearly dredging result for fifteen years. It is to be appreciated, then, that, bearing in mind the conditions adverse to favourable prosecution of operations, nevertheless every endeavour per medium of dredging was made to obtain and maintain satisfactory working depths at the entrance and in the harbour.

The following tabulation indicates the number of days during the year on which the various depths at high water obtained on the bar, with the comparative figures of some previous years:—

Number of Days on which Depth obtained on the Bar at High Water

Depth.	1917.	1924.	1927.	1931.	1939.	1942.	1943.	1944.	1945.
14′ to 16′	..	..	..	..	..	..	..	1	..
16′ to 18′	..	..	..	25	2	1	9	39	23
18′ to 20′	..	4	..	132	88	33	56	96	69
20′ to 22′	..	110	26	165	149	181	152	150	142
22′ to 24′	22	162	112	43	115	143	125	75	87
24′ to 26′	143	86	125	..	11	7	23	5	43
26′ to 28′	137	4	70	..	..	..	..	..	1
Over 28′	63	..	32	..	..	..	..	..	..
Mean for year ..	26′ 3″	23′ 2″	24′ 10″	20′ 2″	21′ 3″	21′ 9″	21′ 8″	20′ 8″	21′ 4″

NOTES.—In the foregoing tabulation the years quoted are as at 31st March. In the history of the port 1917 was the year of best depth conditions. This was during the year following completion of the last breakwaters extension plus a period of very intensive dredging.

The good return of working depths for 1927 was the result of many floods in the river in that year, topped by the exceptionally great flood of 5th November, 1926.

The figures for 1931, except for 1934 (depression circumstances), represent the poorest working depth conditions for over forty years.

During the past year a total of 301 vessels, aggregating 211,449 tons net register, worked the port, as against 309 vessels for 220,824 tons the previous year, representing little difference comparatively.

Similarly, there was little difference between the two years in the quantity of coal shipped from the port, which is primarily the working trade of the port.

At the above 301 vessels such represented the least number which have ever worked the port in any one year, but the average net tonnage per vessel is well above the average, even though such fact was not assisted by the larger class of overseas vessels which, until two or three years ago, used to visit the port for supplies of bunker coal, and on occasions overseas cargoes. The indication is that year by year the smaller class of coastal vessels which for so long worked the port are disappearing from the trade.

Several intercolonial vessels, 9 in all, visited the port during the year to replenish bunkers only lifting in all some 5,250 tons of such class of coal.

During last year the total quantity of coal shipped was 402,017 tons, as compared with 401,383 during the previous year.

The great demand for coal these days, and—as is not uncommon with many other essential commodities due to the unusual conditions of the times—shortage of supply to demand, has for some time past caused the spotlight of blame for the circumstances to be directed heavily on the port and the administration. Admitting that the working depths, by which the effective operation of the port is measured, are not what even the administration would like them to be, and which circumstance is by no means being overlooked by the administration, it is interesting to study and analyse the following records of annual shipments from the port and working depths:—

Year.	Mean of High Water Depths on Bar.	Total Quantity of Coal shipped.
	Ft. in.	Tons.
1931	20 2	513,500
1939	21 3	426,400
1942	21 9	487,500
1943	21 8	446,500
1944	20 8	401,300
1945	21 4	402,000

During the year ended 31st March, 1931, the working depths month by month were, except for one other year only, the worst during the last forty-odd years, and quite appreciably worse than during the past year, yet even then well over 100,000 tons more coal was carried away by shipping during that year.

In 1939 bar depths were, on the average, comparable with the past year, yet still the quantity of coal carried out was appreciably greater.

Bar depths averaged very similarly in the years 1942 and 1943, yet the latter saw a marked decline in the quantity of coal shipped from the port. It might be advanced that the opening of the Buller Gorge Railway early in 1943 year, and the resulting railage of coal to the East Coast, accounted for this, but, although the quantity of coal being so railed is quite appreciable, having amounted to some 41,000 tons during the past year, such has been more than compensated for by the quantity being railed into Westport for shipment from mines in the Gorge and Reefton areas, which totalled some 54,000 tons during this past year.

Earlier in this report it has been mentioned that the administration is by no means unconcerned in regard to the circumstances which, with increasing frequency, result in periods during conditions encouraging to such, of shoaling of the bar by sand drift along the coast, with consequence of great handicap to, and loss of efficiency in, shipping working the port, with resultant disorganization in flow of coal from source of supply to consumers.

With view to deciding upon remedial measures to effect improvement, the Hon. the Minister early in the year called upon Mr. F. W. Furkert, M.I.C.E., to inspect the harbour and submit recommendations, and later in the year three other eminent engineers in Messrs. J. Wood, D. Holderness, and T. A. Johnston also reported to the Hon. the Minister on the matter. Consequent upon these reports steps have been taken to ascertain the possibility of improving upon the port dredging equipment not only in the direction of increasing the capacity of the plant for dredging on the bar and at the entrance, but also within the harbour in the way of enlarging the tidal capacity internally for inducing scour on the bar during ebb-tide periods. Contact has been made with the dredge-building industry both within New Zealand and abroad, and preparation of specification for a suction dredge suitable to the conditions at the port is in course of compilation.

The port operating and maintenance staff now numbers 90 in all, as compared with 55 in pre-war years. Much is being done in maintenance of the port equipment, dredges, and buildings in good repair. In this connection numerous items of maintenance equipment and facilities have during the last year been added to the port establishment, and steps have been taken to obtain up-to-date tools and machinery for the workshops, with view to carrying out on the job much maintenance and repair work on the dredging fleet which hitherto has prolonged overhauls of vessels when on bi-annual dock surveys at Wellington or Lyttelton.

Shipbuilding

The Shipbuilding Division of the Marine Department, working under the direction of the Hon. the Minister of Supply and Munitions, has continued to make excellent progress with the completion of the programme for our American Allies, who have reported most favourably on the vessels already constructed and placed in commission. In addition to the requirements of New Zealand Navy, which were 13 minesweepers, 12 "Fairmile" patrol vessels, and 1 oil-barge, this section of the Department has completed 50 wooden tow-boats, 17 steel tugs, and 10 powered lighters for the U.S.A. programme. Work at this date consists of the completion of the American programme, the construction of five 60 ft. wooden servicing vessels for the Western Pacific Administration and 24 tow-boats (wooden) for the Eastern Group Supply Council. The photographs included in this report are indicative of the five largest types of vessels we have constructed in New Zealand during the war.

Ship Repairs Costing Service

The advantage of this service to shipowners is now being recognized, and there seems no doubt that the scheme commends itself to the principal shipping companies. All repair costs for vessels coming under this service now require to comply with a Price Order, which stabilizes and standardizes costs, the service ensuring the availability of men and materials and giving a quick turn-round for vessels, particularly coastal and overseas units. The Central Dock and Repairs Committee, under the direction of the Controller of Shipbuilding, receives applications for, and allots, docking and slipway usage throughout New Zealand, ensuring that priority vessels have use of these utilities at a time least inconvenient to the unit and to the shipping trade generally. This appears to be a wartime control which could well be maintained in the peace years to the advantage of every shipowner. Repairs to vessels of the U.S.A. have been on a large scale during the year. The total cost of ship repairs which came under the Costing Service during the past year was £576,594. Eulogistic reference has been made to the efficiency and expediency of the ship repairs in New Zealand by the British Ministry of War Transport and other bodies. Particular reference was made to the good work performed on the refrigerated vessel which required five holds dismantled and completely retimbered and insulated. The work on this vessel was executed by utilizing carpenters kindly made available by the Wellington Master Builders' Association in a real co-operative effort.

Examination of Masters and Mates

Examinations for certificates as Masters and Mates were held in Auckland and Wellington on the scheduled dates, with special examinations in Wellington at times to meet the convenience of candidates unable, owing to war conditions, to present themselves on the scheduled dates. Examinations were conducted in a satisfactory manner, and those for foreign-going service were in accordance with the requirements of the Imperial Ministry of Shipping. During the year 123 examinations were held, as against 75 for the preceding year. Details are as follows: Foreign-going Masters and Mates, 79; Home-trade Masters and Mates, 30; Master River Steamer, 5; Yacht Master in New Zealand waters, 2; Master Harbour or River Sailing Ship, 1; Examination in Compass Deviation, 3; Examinations for Square Rigged Endorsement, 2; Examination for New Zealand Pilot, 1.

Examination of Marine Engineers

In the course of the year 240 candidates were examined for Marine Engineers' Certificates of Competency at the various examination centres throughout the Dominion. Of these, 69 candidates were examined for First- and Second-class Certificates of Imperial Validity, and 93 candidates for Third Marine and Coastal Motor Certificates of New Zealand Validity.

Of the 69 candidates for Imperial Certificates, 29 passed for certificates, 32 partially passed, and 8 failed in the examination.

Of the 93 candidates for Certificates of New Zealand Validity, 77 candidates were examined for Third Marine and 16 for Coastal Motor Certificates. In the examination for Third-class certificate 54 passed and 23 failed. For First-class Coastal Motor 3 passed. In the examination for Second-class Coastal Motor Certificate 12 passed and 1 failed.

Summary

1. *First and Second Examinations for Imperial Validity Certificates.*—42 per cent. passed for certificates, 46 per cent. partially passed, and 12 per cent. failed in the examination.

2. *Third Marine Examination.*—70 per cent. passed for certificates and 30 per cent. failed in the examination.

3. *First and Second Class Coastal Motor Examination.*—93 per cent. passed for certificates and 7 per cent. failed in the examination.

The remaining 78 candidates were examined for River Engineer, Marine Engine Drivers and Restricted Limits, P.V.O.S. Certificates of Competency. Of these, 11 passed and 1 failed for River Engineer, 2 passed for Marine Engine Driver, and for the Restricted Limits, P.V.O.S. examination 61 passed and 3 failed.

During the year there has been a considerable increase of candidates sitting for Third-class Marine Examination, amounting to 87 per cent.

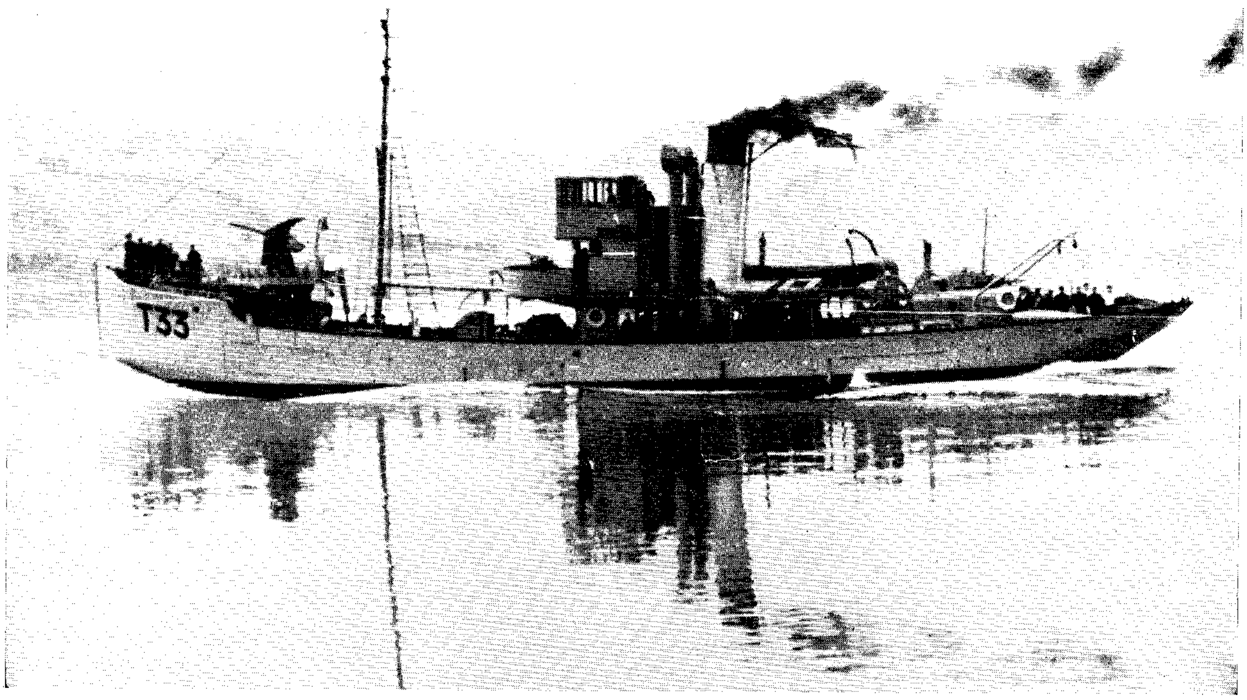
There has been an increased number of special examinations held during the year to accommodate candidates desiring to be examined for First-class and Second-class Imperial Validity Certificates who have only had a limited period of time in port. In all cases the special examinations have been held in Wellington.

Survey of Ships

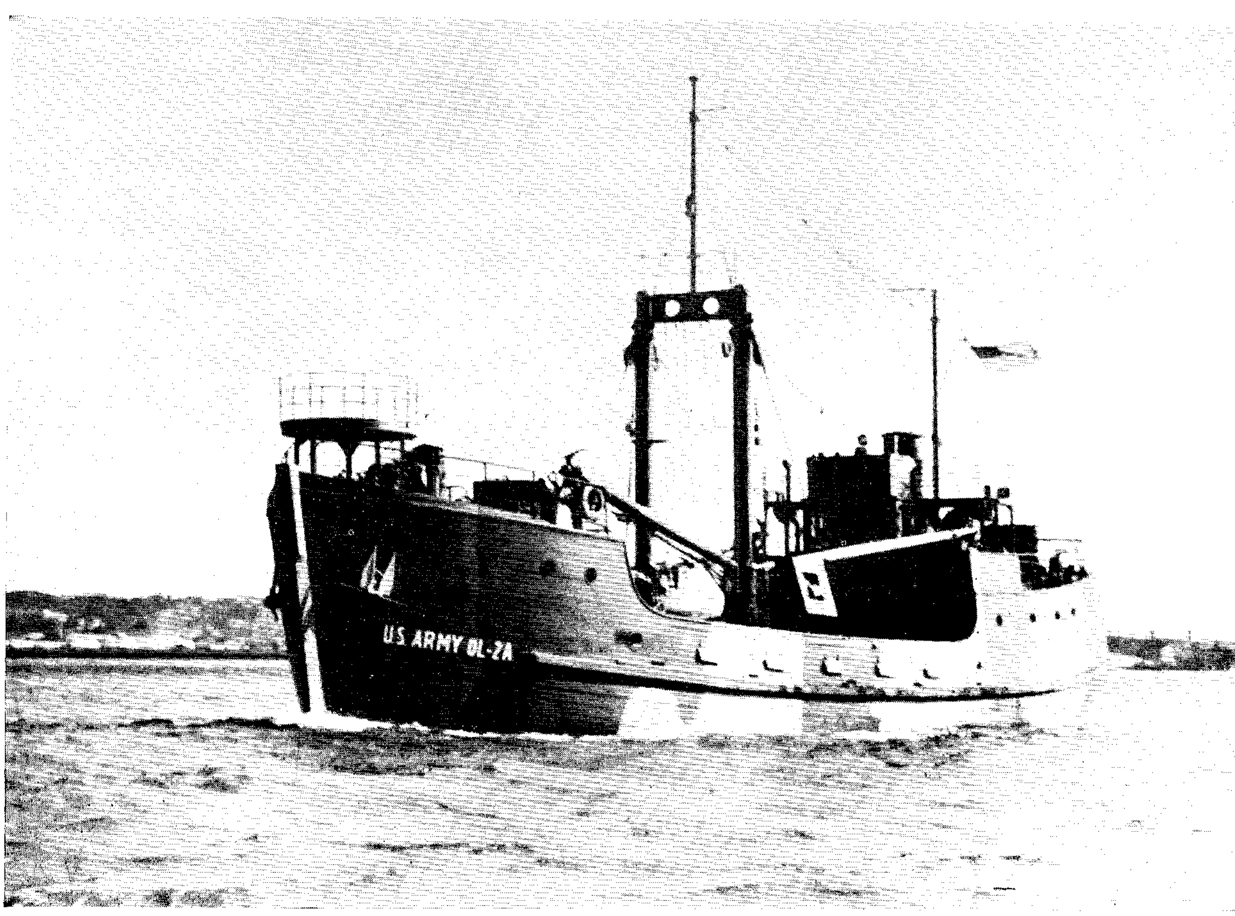
Survey certificates were issued during the year for 4 steam and 5 motor foreign-going ships, 21 steam and 59 motor home-trade ships, and 41 steam and 223 motor restricted-limits ships and launches. Equipment certificates were issued for 11 foreign-going, 20 home-trade, and 5 restricted-limits-classed cargo-ships. The total survey and equipment certificates issued was 389, against a total of 374 issued last year.

In addition to the annual surveys for survey and equipment certificates, 221 seaworthiness, efficiency, tonnage, radio telegraphy, and other surveys were made during the year. Thirty-three of these surveys were made to overseas ships not registered or normally surveyed in the Dominion.

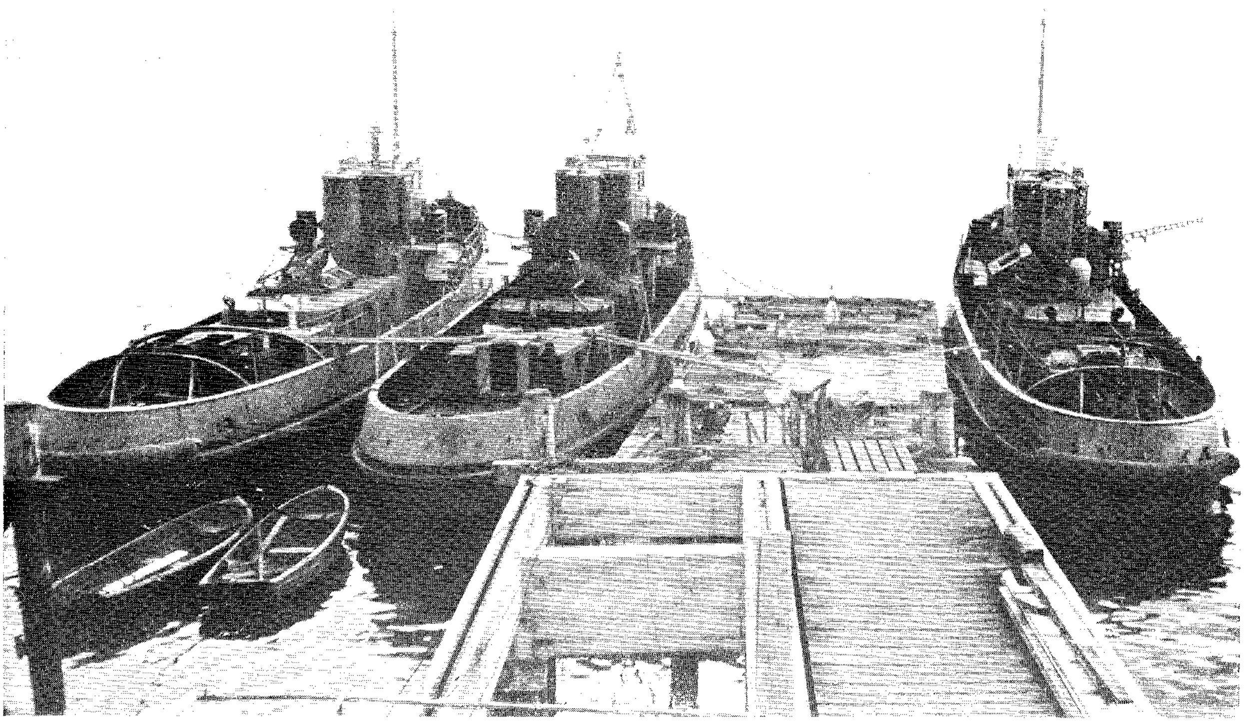
In many cases annual surveys could not be attended to on the due dates owing to a shortage of dry-dock and slip accommodation, and certificates had to be extended, or short-dated certificates issued after a survey afloat, to enable ships to carry on in service until they could be docked or slipped for survey of underwater hull and fittings. The demands for docks and slips has been abnormal, and the difficulty in providing accommodation without undue delay can be attributed to the repair requirements



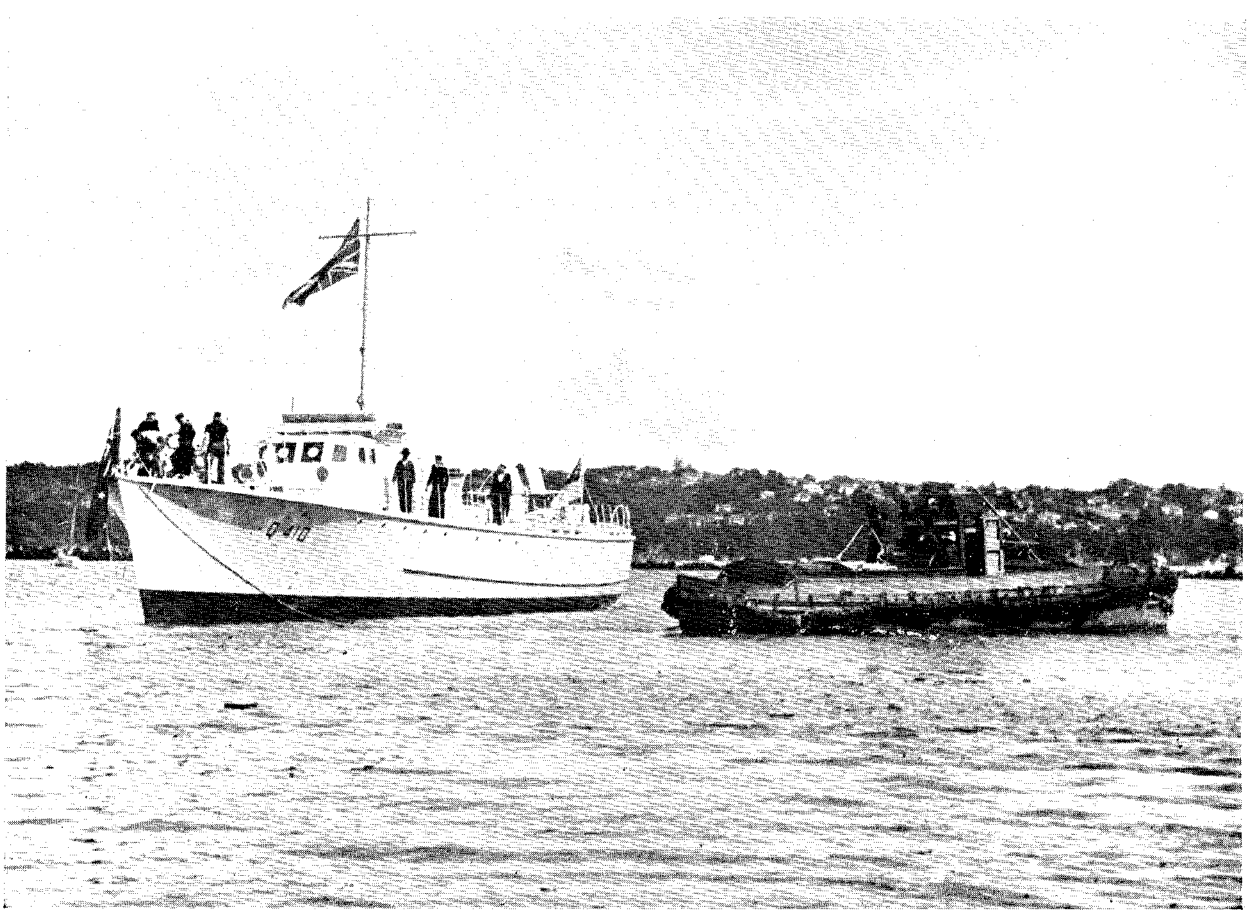
One of the Steel Minesweepers constructed at Port Chalmers



114 ft. Powered Cargo-lighters as constructed at Auckland



75 FT. STEEL TUGS UNDER COMPLETION AT AUCKLAND



ONE OF THE "FAIRMILE" PATROL VESSELS CONSTRUCTED AT AUCKLAND

45 ft. Wooden Tugs being launched at Auckland

of overseas ships, reconversion and reconditioning of tonnage handed back to commerce by Navy, and to extensive repairs to some ships as a result of delay in carrying out full repairs during the early war period. Quick turn-round in dock was in many cases impracticable owing to the acute shortage of skilled labour. One overseas ship was some weeks on drydock undergoing extensive repairs to her wooden hull. Skilled shipwright labour had to be provided from other ports to assist with the work. Another overseas ship was many months in a New Zealand port undergoing repairs and reconditioning on behalf of the Ministry of War Transport, London.

The work of reconversion of commercial tonnage taken up for use by Navy during the early part of the war made a heavy demand on repair facilities throughout the Dominion. The ships included a fair number of coasting vessels and a large number of launches of all kinds. One ship—the s.s "Wairua"—formerly used in the passenger and cargo service between Auckland and Tauranga and taken up for minesweeping purposes, was retained by the Government and converted into a ferry steamer for the run between Bluff and Stewart Island. This service was maintained before the war by the motorship "Tamatea." She was taken up early for war duties in the Western Pacific, and as a temporary measure the fishing-vessel s.s. "Orewa" was fitted out for the service. The "Orewa" was small and slow and not altogether suitable for the inclement-weather run across Foveaux Strait. The "Wairua" is 139 ft. long with a gross tonnage of 324 tons, and is an excellent seaboat well suited for the run. A comfortable well-fitted-out cabin for 72 persons was provided aft, and an awning deck was fitted for the protection of deck passengers. Her total accommodation is suitable for 347 adults. The "Wairua" has maintained the service since before Christmas 1944, and has proved very successful.

New construction during the year included five 60 ft. vessels for the High Commissioner, Western Pacific. They are small cargo and general utility vessels for inter-island service powered with Diesel engines. They were laid down in Auckland during 1944, and first deliveries have been made since the close of the year under review on 31st March, 1945.

A shortage of qualified officers for the smaller coasting vessels has been experienced during the year, and on many occasions it has been found necessary to issue permits for men to act in higher positions until the services of properly certificated officers could be obtained. It is expected that the shortage will remain acute until the termination of war in the Pacific.

Inspection of Machinery

Boilers

The following statement shows the number of inspections of fired boilers, unfired pressure vessels, and air receivers made during the year, with the corresponding figures for the previous year shown in parentheses:—

Fired boilers	4,499	(4,600)
Unfired steam-pressure vessels	6,607	(6,319)
Air receivers	3,491	(3,228)
Total inspections	14,597	(14,147)

The inspections include 127 new power-boilers, aggregating 2,204 horse-power, manufactured in the Dominion, and 51 new power-boilers, aggregating 738 horse-power, imported from abroad. The inspections also include 488 new steam-pressure vessels and 95 new air-receivers made in the Dominion and 130 steam-pressure vessels and 26 new air-receivers imported from overseas.

First inspections of bakers' steam-tube ovens were made during the year. The classification of these plants as pressure-producing apparatus was until recent years left in doubt. They have now been definitely classed by the Imperial Government as steam-boilers and as such are subject to the statutory examination and certification governing boilers. New Zealand has followed suit and classified them as boilers under the Inspection of Machinery Act. The apparatus consists of a number of sealed tubes each of which is a separate element. A certain amount of water is placed in each tube before sealing. The ends are exposed to the furnace fire and, on generation of steam, heat is conducted to the oven through the remainder of the tube. There are no safety-valve, water-gauge, or other fittings of the normal boiler. Safety is dependent on the temperature of the oven, which is usually round about 500° F. Steam-pressure at this temperature is about 1,000 lb. per square inch. The tubes are safe at this pressure provided their condition is maintained. New tubes are tested during construction to a pressure up to 6,000 lb. per square inch.

Machinery

The following statement shows the number of machines, machinery plants, lifts, cranes, hoists, and tractors inspected during the year, with the corresponding figures for the previous year shown in parentheses:—

Machines not drawn by steam-power in 10,806 (10,815) plants	81,155	(82,760)
Machines driven by steam power in 1,640 (1,825) plants	8,053	(9,595)
Electric-supply stations	129	(109)
Lifts	3,331	(3,470)
Cranes	529	(545)
Hoists	1,885	(1,768)
Tractors	351	(353)
Total machinery inspections	95,433	(98,600)

The number of machinery inspections made during the year shows a decrease of 3,167 inspections over the previous year. Included in the inspections are 46 cranes and 32 lifts inspected for the first time. The revenue, however, shows an increase over the previous year.

The number of accidents reported during the year in connection with boilers, cranes, lifts, hoists, and general machinery inspected by the Inspection of Machinery Branch of the Department was 139, of which 7 were fatal. In accordance with the established practice of the Department, every legally notifiable accident was fully investigated as soon as practicable after its occurrence, and steps taken to improve the guards, where possible, to eliminate accident producing hazards.

Two of the fatal accidents occurred with circular saws, 2 with transmission machinery, 1 at a log-hauling winch, and 1 at a glass-bevelling wheel. The remaining accident was at a wood-fired boiler, when a blow back from flue gas burnt the boiler attendant.

Twenty-four of the non-fatal were with circular saws, 13 with power planers, and 10 with power-presses. These machines, as proved by accidents in this and in previous years, are the most hazardous used in New Zealand industry. Particular attention is given to the guarding by the inspecting staff, and freely distributed notices and posters call the attention of owners and operators to their dangers.

A poster campaign was fully developed during the year, and twenty-five attractive posters, sufficient for a weekly display for about six months without repetition, were distributed to the leading factories in the Dominion. Many firms have been most co-operative and expressed appreciation of the service given by the Department on this most important matter of safety for machine workers.

Circular instructions were issued to the staff in respect of machines, of which the safeguarding, from accident experience, was known to be defective or inadequate. A case in point is the open-bowl dough-mixer. An accident with this type of machine drew attention to the necessity for a proper safeguard around the bowl. A guard was tried out with a Wellington machine, and on proving successful instructions were issued for similar guards to be fitted to all these machines in the Dominion.

The following table shows the number of accidents, both fatal and non-fatal, which occurred during the year. The various machines at which the majority of the accidents occurred are mentioned, together with the leading industries in which they are engaged.

Accidents, 1944–45

Industries

Machines.	Woodworking.	Textile.	Refrigerating.	Printing.	Metal-working and Engineering.	Laundry.	Butchery.	Confectionery and Bakery.	Boxmaking.	Other Industries.	Fatal.	Non-fatal.	Total Accidents (Machines).
Circular saws ..	23	..	..	..	..	..	..	..	..	3	2	24	26
Wood-planes ..	11	..	1	..	..	..	..	..	..	1	..	13	13
Shapers and moulders	2	..	..	..	..	..	..	..	..	..	..	2	2
Power-presses ..	..	..	..	..	7	..	..	..	1	2	..	10	10
Guillotines ..	..	..	..	..	2	..	..	..	2	3	..	7	7
Laundry machinery	..	..	..	..	..	1	..	..	..	..	..	1	1
Cranes and hoists ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lifts	..	..	..	..	..	..	..	..	..	2	..	2	2
Belting	..	..	..	..	..	..	..	..	..	2	1	1	2
Shafting	1	..	1	..	..	..	..	..	..	2	1	3	4
Gearing	2	..	..	..	..	..	..	..	..	..	..	2	2
Mincers	..	..	..	..	..	..	1	..	..	..	..	1	1
Other	5	7	5	5	8	..	..	4	1	24	3	56	59
Total accidents (industries)	44	7	7	5	17	1	1	4	4	39	7	122	129

General Harbour Regulations

The number of accidents to persons engaged in loading or unloading or repairing ships, together with the failures of gear used in loading or discharging ships, notified under Regulation 103 of the General Harbour Regulations was 276, of which 8 were fatal accidents. The number of accidents of the previous year was 270, of which 2 were fatal.

Of the 8 fatalities reported during the year 5 were due to falls down holds of ships and 1 to a falling hatch-cover. Another fatality was due to complications arising from a crushed little finger. The remaining fatal accident was due to the failure of guy ropes and derrick when a heavy lift was being discharged from an overseas ship. The accident was fully investigated, and it was found that the primary cause was overloading of the gear and consequent failure of the guy ropes.

The following is a classification of the accidents and failures:—

Handling goods	83
Persons slipping or falling	62
Persons struck by swinging or falling load	62
Persons stepping on or striking fixed objects	11
Contact with power-driven machinery	3
Failures of gear	35
Not otherwise classified	20
Total	276

New Zealand Standards

The Department was represented on the Executive Committee of the Standards Council and the Mechanical Engineering Divisional Committee, and meetings were attended throughout the year. A number of specifications and war emergency specifications were examined and written comments furnished.

Staff: Inspection of Machinery Branch

Mr. W. W. W. Burgess and Mr. W. T. Warren were appointed to the combined positions of Inspector of Machinery and Engineer-Surveyor of Ships during the year. Both are stationed at Wellington.

Mr. G. S. Mitchell, Inspector of Machinery, Wanganui, retired for medical reasons at the end of the year.

The staff has given considerably more extensive services than are indicated by the number of ship surveys and boiler and machinery inspections.

All conversions of ships handed back from war service have been planned and supervised by the Marine Department staff, and reports on tenders for these vessels and valuations for repurchase have been made as required.

In addition, the Department's Surveyors have supervised the construction of new vessels building at Auckland and Port Chalmers for the United States authorities and the High Commissioner for the Western Pacific.

Examination of Land Engineers, Engine-drivers, and Electric-tram Drivers

These examinations were held during the year at the various offices of the Inspectors of Machinery throughout the Dominion at the regular intervals provided for in the regulations. In addition, a few special examinations were granted, but the holding of special examinations is not encouraged, as it is considered that the regular examinations are of sufficient frequency, and, except in very exceptional circumstances, candidates are expected to arrange that they may attend the scheduled examinations.

The full list of places where the examinations were held is shown in an appended return, as also is the number of candidates examined at each place. The classes of certificates for which examinations were held were: First-class Engine-driver; Second-class Engine-driver; Steam-winding-engine Driver; Electric-winding-engine Driver; Traction-Engine Driver; Locomotive and Traction Engine Driver; Electric-tram Driver; Electric-tram Driver (one-man car).

The total number of candidates examined was 429. Of this number, 354 were successful and 75 failed in their examinations. Altogether, 433 certificates were issued, which includes 354 to successful candidates, the remainder being replacements and issues under the provisions of sections 53, 59, and 62 of the Inspection of Machinery Act, 1928.

Return of the Number of Certificates issued to Land Engine-drivers and Electric-tram Drivers during the Year ended 31st March, 1945

Class.	No.
Service—	
First-class Engine-driver	10
Competency—	
Extra First-class Stationary Engineer	..
First-class Engine-driver	38
Second-class Engine-driver	199
Locomotive and Traction	62
Locomotive-engine Driver	5
Traction-engine Driver	16
Electric-tram Driver	93
Electric-tram Driver (one-man car)	7
Steam-winding-engine Driver	1
Electric-winding-engine Driver	2
	433

Staff

The work of the whole staff during the year has again been excellent, wartime conditions requiring a continuance of the fullest co-operation and effort, which have been readily forthcoming. Particularly pleasing is the effort of some of the wartime appointees who have volunteered or been directed for work in the Department during the war period only. The Marine Department staff have voluntarily contributed approximately £1,000 to the National Patriotic Fund since the commencement of the war by deductions from salary. Contributions to the war loans are also on a satisfactory scale.

Fisheries

An abridged report on the working of the Fisheries Branch of the Department follows hereon.

I have, &c.,
W. C. Smith,
Secretary.

REPORT ON FISHERIES FOR THE YEAR ENDED 31ST MARCH, 1945

I have previously emphasized that statistical material must be not only the skeleton but the very flesh and blood of an annual report on fisheries if it is to be of real value. The reporting, however, involves the prior collection of data in the form of returns of catches landed during the full period by individual vessels at the various ports, followed by their tabulation into suitable summaries, before the information can be digested and studied. This necessitates inevitable delay in commencing the annual report, especially under prevailing limitations of clerical staff and equipment.

In this report the usual tables of statistics have been collated from returns for the *calendar* year, 1st January to 31st December, 1944, instead of from 1st April to 31st March of the following year. Thus they contain the figures relating to the last quarter of the last official year.

The statement which follows gives the estimated total quantity and value of the principal classes of fishery products marketed in the year 1944 :—

	Quantity.	Value. £
Wet fish	308,237 cwt.	522,954
Whitebait	6,172 cwt.	46,084
Oysters—	107,070 lb.	6,513
Dredged	63,949 sacks	47,961
Rock	6,386 sacks	9,579
Mussels	15,390 sacks	6,080
Crayfish	13,850 cwt.	22,970
Toheroa (canned products)	107,070 lb.	6,513
Whale-oil	440 tons	14,000
Quinnat salmon (taken by selling-licensees)—		
By eleven rods	1,398 lb.	140
By one net	423 lb.	
Total values		676,281

The detailed returns are summarized in Tables I to IIc (pp. 30 to 35).

The total landings of wet fish show an increase of 13,792 cwt. over the previous year's total of 294,445 cwt. The total value has increased by £33,686. The total for dredged oysters from Foveaux Strait has declined by 9,170 sacks, and an increase of 558 sacks is shown for rock oysters. The crayfish total is up by 3,001 cwt., and the mussel total down by 1,351 sacks.

On the face of it, that would appear to be a healthy enough indication of the state of our fisheries. However, one needs to look further. One needs, also, to have an insight into other facts than can be gathered from the statements set forth in the rest of this report in order to get a true picture of the economic condition of the Dominion's fisheries. It seems necessary, therefore, to make brief reference to some fundamental points.

Confining consideration to the class " wet fish "—*i.e.*, all the ordinary fishes caught by all methods of fishing in the sea—we find that the annual totals for successive years are as follows :—

Year.	Total Quantity. Cwt.	Total Value. £
1934–35	331,415	294,267
1935–36	363,448	313,106
1936–37	363,128	360,406
1937–38	355,687	413,516
1938–39	356,114	424,643
1939–40	339,231	416,480
1940–41	328,594	440,308
1941–42	326,863	458,393
1942–43	311,971	442,976
1943–44	294,445	489,268
1944	308,237	522,954

That record, with a steady and substantial rise in values over the last ten years, looks quite good, at any rate from the selling angle : not so good from the point of view of the buyers. If we look at the quantitative aspect we see that supplies reached a maximum for the years 1935–37 which was maintained without any substantial decline—no more than might be ascribed to variation due to natural causes—until the outbreak of war. Since 1939 there have been conditions arising from the war which have had the effect of diminishing fish landings—abstractions of men and of vessels from the fishing fleets, some restrictions on where and when fishing operations might be carried on, difficulties about the supply of fishing-gear, engines, spare parts, &c., which have all tended to a reduction of fishing power and still more of fishing time. All this goes some way towards explaining the smaller total landings of the war years and providing an explanation of the substantial increase in the monetary value of the fish between

1934 and 1944. It is not suggested that it supplies a completely satisfactory answer to the question. Why should 363,448 cwt. of fish be valued at £313,106 ten years ago, while in the last year before the war (1938-39) 356,114 cwt. was valued at £424,643 and last year (1944) 308,237 cwt. had a value of £522,954 ? It is certainly not due to an improvement in quality or to the landing of more of the kinds of fish that are in most demand. For instance, here is a comparison between the year 1936-37 (the first year for which the statistical details were available) and the year 1944 in respect of the quantities of the five most important classes of market fish landed in the twelve-month period :—

—	1936–37.		1944.	
	Total Landings.	Percentage of all Fish Landings.	Total Landings.	Percentage of all Fish Landings.
	Cwt.		Cwt.	
Snapper	142,425	39·22	109,013	35·37
Tarakihi	53,114	14·63	44,980	14·59
Hapuku (groper) ..	31,673	8·72	21,901	7·11
Blue cod	27,403	7·55	19,069	6·19
All flat-fish	32,237	8·41	31,565	10·24

If there is one comprehensive explanation that will entirely or almost entirely account for the general rise in wholesale and retail prices, it is this : that the *costs of production* (expenditures on fishing operations) have steadily increased over the last ten years, quite apart from any special wartime factors. The contrast is more marked still if one goes back twenty years. (I have taken only ten years, because our earlier figures are not so reliable as later ones.) Why should this be so ? A detailed answer would be much too lengthy and involved, but it can be said without hesitation that in general it costs more to land fish because fish are now harder to catch. Bigger boats, more highly powered engines, greater fuel consumption, longer voyages, modernized fishing-gear of increased catching power—these are the factors that have been increasingly involved in the reaping of our fish harvests, especially over the past twelve years. Now, although that statement is made with some confidence as a general explanation of the rise in fish prices, there is another aspect which, at least from this Department's point of view, has a more serious significance. The expenditure of more money in capital investment and in working-costs for modernized vessels and fishing-gear is not incurred by people in the fishing industry just in order to beat their rivals in a competitive business. If it were only that, we should have had the effects shown in a crescendo of quantities of fish landed, but, instead, the tendency is in the other direction. The explanation that holds good in general is that as time went on it became necessary to use more power, more time, and more efficient (from the point of view of the fish, more " deadly ") fishing-gear to keep up supplies to about the same level as was formerly maintained with appreciably less trouble and expenditure. The serious aspect about this is that such a remedy is likely to aggravate the disease. Fishing must inevitably kill fish and so diminish the fish population on the grounds that are worked. If after a period of fishery exploitation the stock has reached a certain degree of depletion, there are two courses open to the fishermen to enable them to maintain their supplies for the market and to keep up their earnings. One is to go " farther afield." This is what has been happening with the Auckland fleet of Danish-seiners. Their " home grounds," exploited in the earlier years of Danish-seining after this new and highly efficient method of fishing had been introduced in 1923, were the comparatively near and very productive areas of the Hauraki Gulf. It was mainly the prohibition of Danish-seining, by successive regulations, on practically all the grounds except those in the outer and offshore waters of the Gulf which induced a steadily increasing number of Auckland Danish-seiners to extend their operations to the Bay of Plenty and, to a less extent—because of the patchy nature of the available fishing-grounds—to the more northerly coastal waters. Occasionally Cape Maria van Diemen has been rounded by these vessels for fishing the grounds that lie off the Ninety-mile Beach. In this extension of their field of operations the Danish-seiners have followed the same lines that were taken by the Auckland steam-trawlers before them. Only by the acquisition of larger, more seaworthy, and more powerfully engined vessels could these longer voyages be made. The waters of Rangaunu Bay, Doubtless Bay, Whangaroa Harbour, Bay of Islands, Whangaruru Harbour, Tutukaka Harbour, and Whangarei Harbour have, by regulation, been closed to Danish-seining, as to trawling, for many years. The inshore waters off the open coasts are, as mentioned, patchy and of small extent, but unfortunately there would appear to be no very productive grounds offshore in the open sea, the depth of which increases very considerably at no great distance from the land. The continued exploitation of the stocks of fish inhabiting these limited grounds has manifestly led to their deterioration. The destruction of spawning-grounds and feeding-grounds, which has been so frequently alleged by people who urge further restrictions and closures of inshore areas to this method of fishing, is, in my opinion, an entirely imaginary objection. Taking fish in large quantities out of the sea, like drawing large sums out of a banking account, leaves so much less for future use and also so much less to reproduce more, in the case of the money by way of interest and in the case of fish by natural propagation. The problem of the conservation of fisheries is mainly that of ensuring that no more fish are taken out than can be replaced by the surviving brood-stock by natural reproduction and growth. Natural enemies and naturally adverse factors there are, of course, and these are not constant, but variable in effect from year to year. That fishery exploitation by man is the biggest factor in bringing about the reduction of a fish population is, however, quite manifestly the case with regard to our own fish fauna, at any rate when modern methods of catching are employed.

The depletion of fish stocks by intensive and continuous fishery operations is by no means peculiar to New Zealand. It has happened all over the world, in seas where the natural abundance of fish-life is very considerably greater than is the case in New Zealand seas. It shows itself first on those grounds that are nearest to the bases of the industry. The usual sequel, specially exemplified in the history of the British fishing industry, is, on the one hand, to improve the catching power employed, in the attempt to gather in as many fish from the sparsely stocked grounds as had formerly been taken from the undepleted population: on the other hand, to build bigger vessels and make voyages to more distant and still virgin fisheries. Thus, in the course of about thirty years the steam-trawler fleets of Britain had extended their operations throughout every part of the surrounding seas to the Arctic Circle and to the Morocco coast, and eventually in some cases across the Atlantic Ocean to the Labrador Banks. In our own latitude we had one or two trawlers from Sydney making fishing voyages to New Zealand waters a few years ago. However, this is what happens, and what is inevitable, when the fishing-grounds near a home port in New Zealand are closed by regulation or become less productive. The boats that can do so make longer voyages, but they still need to fish, and do fish, mainly the inshore waters because there are no extensive and productive grounds away out to sea off these oceanic islands of New Zealand. It is these facts which constitute the most difficult major problem for fishery administration in New Zealand at the present time and for the immediate future.

In making this statement I am not referring particularly to the complaints, agitations, and petitions with which from time to time the Department has been called upon to deal, emanating from individual coastal settlers, local bodies, and combinations of local bodies, protesting against the operations of "trawlers" on their local inshore fishing-grounds and calling for the closure of these areas to the operations of the visiting commercial fishing-vessels. Such representations tend to fill up much space in departmental files and occupy a good deal of departmental time, but, generally speaking, they provide no information about facts of which we are not already aware. Almost invariably they demand the protection of "breeding-grounds" that are unknown to the Department and equally unknown to the fishes themselves. It would certainly improve the catches of the local amateur and professional line fishermen if all such areas were prohibited to "power-fishing" vessels. It would be a matter of bringing less fish to the shops and leaving more in the sea. Another somewhat similar cause of complaint has arisen from the development during the war years of special fisheries for supplying fish to the recently established canneries. The kinds that form the bulk of cannery fish are principally kahawai and trevally, and for the capture of the schools of these fish that from time to time enter a harbour from the open sea use has been made of very large seines (drag-nets) with long lengths of rope for hauling. Such a method, in its capacity to sweep round a large area of ground and make a big haul of fish, closely approximates to the efficiency of Danish-seining (to which all such waters are closed). If there happens to be plenty of other fish such as snapper on the area encircled, then a large catch of snapper is made. So far as snapper-fishing is concerned, it would be reasonable to prohibit the use of this gear in waters such as Whangarei Harbour, which is one of the localities involved. The snapper population of such a harbour depends on migrations from the open sea, and is naturally limited and quickly depleted by intensive methods. They might very well be left for the relatively modest degree of exploitation resulting from the ordinary local fishing methods. The problem for the fishery administrator is to balance the undesirability of a too wholesale method of taking snapper against the advantages of making profitable use of the much larger quantities of kahawai, trevally, parore, sharks, &c., that would otherwise benefit no one very much. Not only each method of fishing, but also each species of fish, at least of the principal commercial kinds, calls for special consideration. It calls also for special study—for the organized observations that represent investigation—as a basis for proper consideration.

The point that it is desired to make by these remarks, possibly too brief and sketchy to be very illuminating, is that a good deal more than regulations on paper, and a good deal more than a clerical staff to reply to correspondence, is necessary to place fishery administration on a sound basis and to ensure that rational and effective provision is made for the conservation of fisheries. The most important work of fishery officials is that of those who are in frequent, if not continuous, contact with the practical fishery operations and the people who run them. Only thus can prompt and reliable information be obtained on which measures for the regulation of fisheries may be based; and only by the activities of a keen and adequately mobilized staff of Inspectors can the regulations that are made be enforced. We also need to be possessed of much more information about the fishes themselves, not merely as species but as populations. This information can only be obtained by biological investigations designed to throw light on such questions as their abundance and its changes, and the causes of such changes, their migrations, their spawning habits and how these are related to times and places, their rate of growth, and their age at first maturity. These classes of facts can be ascertained—they have been ascertained in respect of many species of fishes in other parts of the world—and they are essential as a basis for the rational regulation of the fisheries. Especially do we require to obtain comprehensive, not spasmodic, data on the real effect of various fishing methods, both those that are now employed and those that might be employed. It was sixteen years ago that I concluded a report on the Hauraki Gulf fisheries by pointing out that it was "cheaper to investigate our resources in advance than to investigate their depletion after it has taken place." Since that date the powers of exploitation have developed apace, but the machinery for conservation has not kept abreast of those developments. It is true that in the last eight years a Fisheries Branch to the Department in Wellington has come into being with a staff to deal with systematically collected fishery returns as a basis for statistical records which provides what is probably the most important part of our fisheries intelligence. The system is considerably short of the ideal, mainly because it provides insufficient data for correlating the quantities of fish caught with the power and time expended in the catching. Better statistics, however, call for better and more thorough-going contacts with the industry—more Inspectors. It is also true that eight years ago provision was made for the appointment of three District Inspectors of Fisheries, providing for contacts with those engaged in fishing to an extent that had not been formerly possible. It is also true that in 1939 the Department became possessed of a newly built and specially designed oil-engined vessel of 65 ft. length which would have enabled our fishery patrol to operate on more equal terms with the new Danish-seiners, whose disregard for fishery regulations had for too long been practised with impunity. The same vessel would have enabled direct trials to be made of various methods of fishing and provided valuable scientific data on some important problems. This vessel was taken over for naval duties, and it would appear that her services are still required for those purposes. It is true that financial depression held back developments in the first part of the "thirties" decade, and five years of war have imposed relatively greater handicaps. These set-backs are not mentioned merely as excuses for things left undone, but rather to emphasize the urgent necessity for strengthening and improving fisheries administration to enable it to deal with existing problems and with the still more difficult ones which are assuredly lying ahead. The need is for more information—industrial, statistical, and biological—and a departmental set-up that is organized to make prompt use of it.

A further point may be mentioned regarding the legislative aspect. The Fisheries Act, 1908, was based on conditions that are now largely out of date, and, even when fresh, the conceptions which inspired the legislation were echoes of overseas enactments that were frequently not applicable to New Zealand conditions and were therefore "more honoured in the breach than the observance." The time is ripe for considering the drawing-up of a new Fisheries Act. The peculiar circumstances under which the commercial fisheries are conducted and developed make it necessary that regulations should be brought out or amended in the minimum time. Control by Orders in Council is thus inevitable. Only general principles and procedures can be suitably established by parliamentary statutes. Even so, there has been a general tendency for the issue and enforcement of fishery regulations to lag too far behind the practices which they are intended to control. To meet the requirements of the immediate future in this respect demands an increa ed and better-mobilized outdoor staff and better co-ordinated staff work at headquarters. It should be realized that fishery regulations cannot be drawn up, passed, and published and then remain unchanged for a long period, as is the case with most other departmental regulations. The active units in the fishing industry are pre-eminently enterprising and resourceful. This and the changed aspect of a fishery that may arise from natural variations or, more often, from progress in our understanding of the conditions, make amendments to regulations necessary at comparatively short intervals. A recommendation that at least should be considered, for implementing when more normal conditions return, is that current fisheries regulations should be issued annually and circulated to the holders of fishing licenses.

Fishing-vessels and Personnel

The number of licensed fishing-vessels operating in 1944 was 721, which is 30 less than the number engaged in fishing last year. Twenty-four small motor trawlers have gone, but Auckland and Wellington each had its fishing fleet appreciably reinforced by the return of one large deep-sea steam-trawler during the year. The figure for Danish-seining vessels remains unchanged; and there has been a substantial increase in the number of vessels engaged in line and net fishing amounting to 168 full-time and 349 part-time, compared with 114 and 319 respectively in these classes in 1943. The number of vessels engaged in oyster-dredging in Foveaux Strait and mussel-dredging in Hauraki Gulf remains unchanged at 9 and 3 respectively. The number of vessels returned as engaged entirely in crayfishing is 27, and those engaged for a portion of their time number 69, last year's figures being 39 and 63 respectively.

Fishermen in the whole-time class have fallen in number from 856 to 711, while part-time fishermen numbered 641, as against 638 for the previous year.

Particulars for the separate ports are given in Table I.

Fish Landings

The total quantities of fish and shell-fish landed at the various ports are shown in Table II.

Snapper, the most abundant species, shows an increase of 8,471 cwt. over last year's total and constitutes 35·37 per cent. of all the wet fish landed in the Dominion. Tarakihi, which is second in importance among market fish, also shows a notable increase of 15,669 cwt., and provides 14·59 per cent. of the total landings. The gurnard total is up by 3,314 cwt., and trevally by 3,808 cwt. It should be pointed out, however, that a good deal of this increase may be more apparent than real, especially for the two last-mentioned kinds, in that improvements have been effected in the detailed returns from individual fishermen, so that sorts of fish that had hitherto been combined in the class designated "mixed rounds" have been properly classed under their specific names.

Thus "mixed rounds," which figured as 20,659 cwt. (7·02 per cent. of total) in 1943-44, have decreased to 8,892 cwt. (2·89 per cent.) in this year's total. Similarly, "mixed flat fish" have been reduced from 4,803 cwt. to 469 cwt.

The total for groper (hapuku) shows a fall from 22,144 cwt. (7·52 per cent.) to 21,901 cwt. (7·11 per cent.). The blue cod total is practically unchanged at 19,069 cwt. The total landings of flatfish (flounders, soles, brill, and "mixed flats") amount to 31,610 cwt., which is less by 7,161 cwt. than the previous year's total.

The weights and values of all the various kinds landed are given below in descending order of quantity :—

Kind or Class of Fish.	Quantity.		Value.	
	Hundredweight.	Percentage of Total.	£	Percentage of of Total.
Snapper	109,013	35·37	143,121	27·37
Tarakihi	44,980	14·59	68,902	13·18
Groper (hapuku)	21,901	7·11	66,795	12·77
Blue cod	19,069	6·19	41,680	7·97
Gurnard	17,764	5·76	21,120	4·04
Flounder	16,001	5·19	52,817	10·10
Sole	15,095	4·90	46,820	8·95
"Mixed rounds"	8,892	2·89	10,361	1·98
Barracouta	8,462	2·75	4,716	0·90
Trevally	8,332	2·70	6,298	1·21
Ling	7,628	2·47	17,565	3·36
Red cod	6,331	2·05	6,289	1·20
Elephant-fish	5,313	1·72	10,477	2·00
Sardine	4,281	1·39	3,122	0·60
Mullet	3,096	1·01	3,571	0·68
Kahawai	2,166	0·70	1,693	0·32
Pioke	1,776	0·58	1,911	0·37
Butterfish	1,463	0·48	3,945	0·75
Warehou	1,084	0·35	2,336	0·45
Hake	1,031	0·33	2,895	0·55
Moki	680	0·22	1,206	0·23
Perch	662	0·21	585	0·11
Kingfish	582	0·19	662	0·13
John-dory	527	0·17	620	0·12
"Mixed flats"	469	0·15	1,321	0·25
Parore	429	0·14	279	0·05
Marlin	234	0·08	292	0·06
Trumpeter	209	0·07	444	0·08
Mackerel	190	0·06	102	0·02
Herring	190	0·06	311	0·06
Conger	128	0·04	90	0·02
Skate	55	0·02	44	0·01
Garfish	47	0·02	105	0·02
Brill	45	0·01	264	0·05
Whiting	44	0·01	66	0·01
Bonita (*Brama*)	31	0·01	82	0·02
Mao-mao	22	0·01	36	0·01
Whiptail	11	..	8	..
Frost-fish	4	..	3	..

Methods of Capture

Of the total catch, 16,412 cwt. (5·33 per cent.) was landed from steam-vessels, motor-vessels accounted for 289,437 cwt. (93·9 per cent.), and row-boats 2,388 cwt. (0·77 per cent.).

The total quantity of fish caught by each of the common methods of fishing is shown below. The figures in parentheses represent the 1943–44 quantities and values :—

Method of Fishing.	Quantity.		Value.	
	Hundredweight.	Percentage of Total.	£	Percentage of Total.
Trawl	75,216 (69,105)	24·40 (23·47)	153,541 (137,204)	29·36 (28·04)
Danish seine	116,222 (113,033)	37·70 (38·39)	152,615 (150,522)	29·18 (30·76)
Long and hand lines	69,495 (68,850)	22·55 (23·38)	147,558 (138,291)	28·22 (28·26)
Net and drag-nets	47,304 (43,457)	15·35 (14·76)	69,240 (63,251)	13·24 (12·93)
Totals	308,237 (294,445)	..	522,954 (489,268)	..

Landings at Ports

Of the total quantity of wet fish, 36·3 per cent. was landed at Auckland. In the statement that follows the total weights and values are given for the principal ports alongside those for the previous year:—

Port.	Quantity.		Value.	
	1943–44.	1944.	1943–44.	1944.
	Cwt.	Cwt.	£	£
Auckland	103,382	111,078	129,904	138,872
Thames	18,302	19,691	28,044	29,665
Tauranga and district	9,546	10,485	9,913	11,242
Gisborne	5,275	7,703	6,179	10,475
Napier	16,615	17,865	25,244	26,529
Wellington	14,775	14,019	36,054	33,548
Lyttelton	14,050	16,221	34,755	42,527
Timaru	15,898	13,022	42,960	37,759
Port Chalmers	21,523	23,264	32,621	38,808
Bluff, with Stewart Island	12,416	12,163	22,748	27,860

Increases are shown for most of the ports. Wellington is an exception, with a decline of 756 cwt. in total weight and £2,506 in total value of the year's landings. Timaru shows a fall of 2,876 cwt. and £5,201. Bluff, with Stewart Island, provided 253 cwt. less of fish, but its value increased by £5,112.

Comparative totals in hundredweights for minor ports are as follows (1943–44 figures in parentheses): Russell, 2,350 (1,136); Whangarei, 4,104 (3,858); Waihi, 486 (768); Manukau Harbour, 1,118 (1,870); Picton, 7,230 (8,052); Karitane, 1,093 (611); Nuggets, 2,140 (2,701); Waikawa, 1,564 (2,896); Westport, 814 (1,434); Motueka, 1,358 (895); Nelson, 5,541 (3,833).

An indication of the trend of fish production at the principal ports may be gathered from the brief statements that follow.

Auckland.—After being without steam-trawler supplies during recent years, the fishing fleet of this port has now been augmented by the return of one of its larger steam-trawlers, which made five landings during the last two months of the year, bringing in 1,929 cwt. of fish, of which approximately 50 per cent. was snapper and 25 per cent. tarakihi. Of the total landings at Auckland, 94·9 per cent. was taken by Danish-seiners. Snapper comprised 74 per cent. and tarakihi 16 per cent. of these catches. The catches by line fishermen have decreased considerably since the previous year, but the catches by net-fishing operations have correspondingly increased. The annual supplies at Auckland over the last five years are given below:—

—	1940–41.	1941–42.	1942–43.	1943–44.	1944.
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Total quantity landed	125,220	119,583	105,106	103,882	111,078
Snapper	91,343	87,028	73,604	75,153	79,844
Tarahiki	13,185	12,882	16,470	12,128	18,289
Flounder	10,026	8,151	3,904	5,489	1,857

Thames.—This port shows an increase of 1,389 cwt. over last year's figure. There has been a steady increase of trevally, gurnard, and pioke (dogfish) during the last few years, probably on account of the increased demand for these cheaper but perfectly nutritious kinds of fish. Set-net fishing provided 18,361 cwt., or 93·3 per cent., of the total fish landed. In the previous year the corresponding figures were 15,545 cwt., or 84·9 per cent. One of the two Danish-seining vessels was laid up some months, which accounts for the reduction in the year's total for this class of fishing to 1,273 cwt. (6·5 per cent. of the port total) from 2,229 cwt., or 12·2 per cent., for the previous year.

Tauranga:—

—	1941–42.	1942–43.	1943–44.	1944.
	Cwt.	Cwt.	Cwt.	Cwt.
Total fish landed	4,368	7,926	9,546	10,485
Snapper	3,400	4,154	4,032	4,152
Tarahiki	102	290	29	1,057
Trevally	110	1,113	1,826	2,509
Kahawai	1	294	649	732

The demand for trevally and kahawai for canning purposes accounts for the steady increase in the landings of these kinds. Set-net catches for the year amounted to 5,987 cwt. (57·1 per cent. of total), of which 2,491 cwt. was trevally and 1,471 cwt. snapper. The Danish-seine catch, provided by one vessel, was 2,907 cwt. (27·7 per cent. of total), of which 1,838 cwt. was snapper and 998 cwt. tarahiki. The total for line fishing was 1,591 cwt., of which 53 per cent. was snapper. A new vessel operating a purse seine for pelagic fish is still at the experimental stage.

Napier.—Out of the total of 17,865 cwt. for this port, 13,929 cwt. was landed by the trawling fleet, which consisted of one steamer and twenty motor-vessels. These vessels have operated farther afield than formerly, some working grounds as far distant as Poverty Bay under the compulsion of adverse weather conditions and poor fishing on the local grounds.

Wellington.—The return of a steam-trawler in December provides a prospect of improved fish supplies for the future. A motor-trawler operated from the port for seven months, landing 901 cwt., or 6·4 per cent., of the annual total. The Island Bay line-fishing fleet was hampered by abnormally bad weather and landed for the year a total of 11,018 cwt., or 78·6 per cent. of Wellington's total supply from its own fleet, which was 756 cwt. less than last year's total. Wellington has always been the principal centre for the supply of warehou, a fish which swims in shoals and is usually captured in nets when the shoals move, or are driven by predators, into shallow bays. The quantities that are caught are subject to considerable variation from year to year, and their abundance, or their inshore occurrence, seems subject to cycles. The records of landings show a peak period during 1936 to 1938, and then they rapidly declined, reaching another peak for the period 1941 to 1943, which now appears to be again on the decline, and this year's total catch of 507 cwt. is only half the average of the annual totals for the previous three years.

Lyttelton.—The total landings amount to 16,221 cwt., valued at £42,527, an increase of 15·5 per cent. in quantity and 22·4 per cent. in value over the previous year's figures. The main increases are shown for tarahiki, ling, and flounders.

Timaru.—With a total quantity for the year of 13,022 cwt., which is less than the previous year's total by 2,876 cwt., the catches landed by trawlers amounted to 8,142 cwt., by Danish-seiners 1,804 cwt., and by lining vessels 3,076 cwt. The greatest relative decline is shown for Danish-seiners with a difference of 704 cwt., trawler landings are down by 375 cwt., and line catches by 797 cwt. To what extent the decreases are due to curtailment of fishing operations by such factors as the weather or to other causes is a question that cannot be fully answered without investigation. In the case of the trawlers and liners there were fewer operating in the whole-time class and more in the part-time class, but with two more licensed trawlers and one additional liner in the fleet. Diminished catches by the two Danish-seiners, especially noticeable in respect of soles, flounders, and red cod, cannot be ascribed to a less intensity of fishing, and must be regarded as an indication of reduced stocks of fish on the grounds.

Port Chalmers.—The annual catches by the various methods of fishing over the last four years are given below:—

——	1941–42.	1942–43.	1943–44.	1944.
	Cwt.	Cwt.	Cwt.	Cwt.
Steam-trawling	12,069	12,011	7,648	5,980
Motor-trawling	11,388	10,241	7,349	9,463
Line-fishing (motor-vessels)	5,508	11,070	6,282	7,648
Line-fishing (row-boats)	..	15	9	1
Net-fishing (motor-vessels)	85	11	33	21
Net-fishing (row-boats)	674	255	202	151
Totals	29,724	33,603	21,523	23,264

The increased total over that for the previous year arises from somewhat better catches of barracouta, flounder, soles, groper, and elephant-fish. Diminished supplies are shown for red cod, tarahiki, pioke (dogfish), and ling, and the general production is substantially below that of the year 1942–43, especially with regard to steam-trawler and line catches.

Exports and Imports

Imports of fish for the year amounted to the small total of 10 cwt. of the class "smoked, dried, salted, &c.," valued at £193, and, in addition, tinned fish valued at £98 was re-exported.

The total value of New Zealand fish and shell-fish that was exported in 1944 was £126,976, which represents a substantial increase on the previous year's corrected total of £110,685.

Totals for the principal classes are given below (last year's corrected figures in parentheses):—

——	Quantity.	Value.
		£ £
Oysters, fresh	21,100 (424) doz.	578 (20)
Fish, frozen	16,628 (16,438) cwt.	73,500 (70,019)
Crayfish, frozen	1,921 (nil) cwt.	6,608 (nil)
Fish, smoked, dried, &c.	3,319 (2,754) cwt.	20,476 (16,574)
Fish and shell-fish (tinned)	181,338 (285,221) lb.	25,814 (24,072)
Total values	..	126,976 (110,685)

Figures for the principal kinds of frozen fish exported for the year 1944, with the previous (official) year's totals in parentheses, are as follows:—

—	Quantity.	Value.
	Cwt.	£ £
Barracouta	3,786 (1,895)	14,014 (6,074)
Blue cod	3,530 (4,104)	18,117 (21,057)
Soles	1,394 (1,898)	7,119 (9,229)
Red cod	1,104 (1,441)	3,046 (3,906)
Snapper	1,029 (1,112)	6,044 (6,487)
Tarahiki	959 (1,398)	4,030 (4,473)
Flounder	762 (1,038)	4,142 (5,408)

The above-mentioned seven kinds made up 75·5 per cent. by weight and 76·9 per cent. by value of the frozen fish exported from New Zealand. The rest of the total of this class, consisting of twenty-four different kinds of fish, amounted to a total weight of 4,064 cwt., with a value of £16,988. Interesting new items among these latter were 97 cwt. of eels, valued at £356, and 53 cwt. of swordfish (marlin), valued at £249.

Sardines

Landings of sardines for the Picton cannery in the year 1944 totalled 4,281 cwt. This represents a substantial decline compared with the previous year and is little more than half the total for the year 1942–43. Although one catch of record dimensions was made in December, 1943, the quest for fish throughout the whole of that summer was difficult and disappointing, and was more successful in Pelorus Sound than in Queen Charlotte Sound, which had hitherto been the scene of the most productive operations. The shoals appeared to be small and scattered, and the fish that were taken were considerably smaller in size than previously. The general scarcity continued throughout the winter and spring. Large shoals suddenly appeared in Pelorus Sound in November, but the problem of transporting these very perishable fish via the Portage to the cannery in Picton has presented many difficulties. Only one boat has been continuously engaged in fishing for cannery supplies, but vessels of the Island Bay line-fishing fleet make occasional visits to the Marlborough Sounds to net sardines for use as bait. Although various initial difficulties have been overcome, this industry must still be regarded as in the pioneering stage, operating somewhat tentatively, with the important problem of locating the fish in due season and in catchable quantities, which is a matter of understanding the underlying causes of their migrations, still to be elucidated.

Reports have been received, through the Marine Biologist, of the recent reappearance of large shoals of sardine-like fish off the Otago coast. Here, too, there is a prospect, though so far as can be seen at present a precarious one, of industrial exploitation of a marine product hitherto unutilized.

Fish-liver Oil

Among other developments in the utilization of fishery products, hitherto wasted, that have been more or less forced upon us by conditions arising out of the war, the fish-liver-oil industry is one of the most important and probably has the best chance of continuing to be a good thing in both its commercial and social aspects after the return of normal economic conditions. During the year 1944 a total weight of 544,300 lb. of fish livers was processed at the two established factories for which not less than £24,000 had been paid to fishermen and from which not less than 20,000 gallons of oil were produced. Exports of fish-liver oils during the year totalled 19,251 gallons. In the same period 15,340 gallons of cod-liver oil and 417 gallons of halibut-liver oil were imported This apparent anomaly perhaps requires explanation. The great cod fisheries of the North Atlantic are the sources of the cod-liver oil of commerce which has been used for a great many years in medicine, more especially for the treatment of rickets and respiratory disease. Only in recent years has science provided an explanation of the factors that are responsible for the therapeutic virtues of cod-liver oil—viz., the vitamins A and D—and subsequently led to the discovery of the same vitamins in the skin, flesh, viscera, but particularly in the liver, of numerous other species of fish. Compared with the cod, some species have less and others more of A or of D or of both, and in some the oil is more difficult to extract. The technology of processing the raw material for the extraction of the most and best oil, and the study of the properties of such oils, have made rapid progress in the last ten years, and will doubtless continue to advance and develop. Cod-liver oil remains the "classic" vitamin oil by virtue of its priority in the fields of commerce and pharmacy, its outstanding abundance, and its fairly rich content of the two vitamins in convenient proportions for therapeutic purposes. Some of our relatively abundant New Zealand fish provide oils that are richer in vitamins. For example, ling has sixteen times as much A and five times as much D; groper (hapuku) has fifty times the potency in A and twenty-two times in D; kingfish, two hundred times as much A and probably about a hundred times as much D. Ling-liver oil, like that of the true cod, is relatively easy of extraction, which is not the case with that of groper and kingfish. Livers from various species of shark yield copious amounts of oils that are particularly rich in vitamin A—in some cases up to over one hundred times as much as in cod-liver oil—but poor in vitamin D.

A large proportion of the oil produced in New Zealand is obtained from vitamin-A-rich shark livers. Nutritional authorities consider that our ordinary New Zealand diet is deficient in vitamin D, more especially for juvenile and maternity requirements, but there is, or there need be, no deficiency of vitamin A. Shark liver and other oils very rich in vitamin A are thus available for export. And this last statement can be strengthened by adding that practically all the rest of the world is under-supplied, while to the populations of those countries which are the concern of UNRRA, their restoration to anything like normal health is absolutely dependent on their receiving, among the "protective" food factors, increased amounts of this vitamin.

The livers of many other species of fish may be used as sources of vitamin-rich oil, but considerable variation is shown in respect of oil yield, vitamin content, and difficulty of processing. These points, together with quantities available as raw material, have an important bearing on the practical problems of production. New Zealand scientists were early in this field of research, and in 1935 two papers were published, by Dr. F. B. Shorland(1) and Dr. Marion Cunningham(2) respectively, which demonstrated the qualities and indicated the potential economic value of some of our New Zealand fish-liver oils.

The export of ling-liver oil, produced by a simple process and in only small quantities, was tentatively begun about this time. It was the prospect of the failure of our overseas supplies, threatened as a result of war developments in 1940, when the requirements of New Zealand had reached a level calling for the annual importation of 63,000 gallons of cod-liver oil, that ultimately brought the question of home production to the fore. Mr. C. Scott, manager of Karitane Products Society, Ltd., whose firm required 10,000 gallons of cod-liver oil a year as a vitally important constituent of their infant food, was the first to express concern, and thus the position was brought to the notice of the Animal Research Division of the Department of Agriculture. The Chief Agricultural Chemist, Mr. R. E. R. Grimmett, arranged for an interdepartmental discussion of the problem, and a meeting was held at his office on 12th June, 1940, attended by Dr. I. J. Cunningham, Chief Biochemist, Animal Research Division, Dr. F. B. Shorland, Agricultural Chemist (specialist in oil chemistry and author of publications on vitamin A determinations), and A. E. Hefford, Chief Inspector of Fisheries, together with Mr. C. Scott, Dr. Marion M. Cunningham (consulting expert to the Karitane Products Society and at that time the only research worker in New Zealand who had carried out determinations of vitamin D), and Mr. J. O. Shorland, who had had some practical experience in the commercial production of medicinal oils from New Zealand fishes. The outcome of this meeting was the preparation of a report covering available information on the Dominion's requirement of vitamin A- and D-containing oils, with special reference to human and farm-stock requirements, on the quality of cod-liver oil substitutes obtainable from New Zealand fishery products, and the quantity and location of available supplies of the raw material. By collaboration between the staffs of the Agricultural Chemical Laboratory and the Fisheries Branch of the Marine Department and the Karitane Products Society's technologists, samples of fish livers were collected, processed, and investigated as to the content and quality of oil. Meanwhile the directorate of Karitane Products Society were considering the establishment of a permanent plant for the production of their requirements of fish-liver oil, but the acquisition of the necessary equipment from overseas was considerably delayed by wartime limitations on import. At about the same time Mr. R. Greenwell was independently beginning production on a relatively small scale in the Auckland District and testing out methods with a view to improving the quality and quantity of the product. There was still no general utilization of fish livers in the Dominion; and in July, 1942, the Hon. the Minister for Scientific and Industrial Research requested that a Committee consisting of the Chief Inspector of Fisheries, Dr. Shorland of the Agricultural Chemistry Department, an officer of the Department of Industries and Commerce, and the Secretary of the Chemical Panel of the Department of Scientific and Industrial Research, be set up to report on the use of fish oils from the industrial and medicinal points of view: the inquiries to cover questions of our national needs as regards quality and quantity, the availability of raw material, and the technical problems involved in developing production. The earlier work of the Committee consisted of the gathering together of information on the points above mentioned. Contacts were maintained with persons who were officially, commercially, or technically interested. The Health Department supplied valuable data covering the nutritional and pharmacological aspects. The principal fact that emerged from the Committee's inquiries and discussions was that the most essential need was for systematic scientific work in the field and in the laboratory for the purpose of determining the relationship between such factors as oil yield and oil quality (especially vitamin content) and species of fish; also sex, age, habitat, and season. It has been shown by overseas scientists, and confirmed by results obtained in New Zealand, that very considerable variation exists according to the factors mentioned. Modern fish-liver-oil production is not a matter of obtaining livers and getting the oil out of them. It is necessary not only to apply the most suitable method of extraction according to the kind of liver used, but also to have as far as possible fore-knowledge of what grade of oil, especially with regard to vitamin content, different kinds and classes of liver can be expected to yield. Other things being equal, the value of these oils depends on the amount of vitamins contained. Both vitamin content and other properties are liable to deterioration if an unsuitable method of extraction is adopted or if either the raw material or the finished product is not stored under proper conditions. To arrive at the best possible standards of treatment, and consequently of product, calls for applied research work by a team of technologists directed by a specialist in the chemistry of oils. This last requirement was well met by the services of Dr. Shorland being made available by his Department; assistance was more problematical in view of the man-power situation: accommodation and equipment most difficult of all. A recommendation, made by resolution of the Committee in January, 1943, that a fish-oils laboratory provided with oil-extraction equipment of "pilot plant" type should be established under Dr. Shorland's direction received Ministerial endorsement, and, moreover, Cabinet approval was obtained for the erection of a building for the work. Unfortunately, the material realization of this scheme was checked by the circumstances of the times, and the trained team of fish-oil technologists of the Agricultural Chemistry Laboratory has since become dispersed owing to the transfer of this unit to the Department's Animal Research Station at Ruakura.

(1) F. B. Shorland: "Vitamin A Content of New Zealand Ling-liver Oil." *N.Z. Journal of Science and Technology*, Vol. 16, No. 5, pp. 313–316 (March, 1935).

(2) Marion M. Cunningham: "The Vitamin D Content of some New Zealand Fish Oils." *N.Z. Journal of Science and Technology*, Vol. 17, No. 3, pp. 563–567 (December, 1935).

The most recent official development in relation to this subject was the setting-up of a panel by the New Zealand Standards Institute, on the request of the Bureau of Industry, to consider the question of drawing up standard specifications for the fish oil manufactured in and imported into New Zealand. This Committee, which is now functioning, consists of representatives of the New Zealand Manufacturers' Federation, the Department of Agriculture, Department of Health, the Chemical Sectional Committee of the Standards Institute, the Pharmacy Board, the Bureau of Industry, and the Marine Department. The results of the investigations made by, or inspired by, the existing interdepartmental Fish Oils Committee have been of fundamental assistance to this panel of the Standards Institute. The necessity for setting up authorized standards for medicinal and nutritional fish oils for the guidance of manufacturers and traders, as well as consumers, is evident. It also follows that there must be an official specialist available for testing samples and giving expert advice on questions relating to fish oil standards. For this one will have to depend principally, and in certain cases entirely, upon the services of the technologists, whose further work is now to be undertaken under the control of the Department of Scientific and Industrial Research. It is hoped that adequate accommodation and equipment will be made available in good time to enable the work to go forward. The necessity for the further scientific elucidation of the problems remaining to be solved, to enable the best value to be obtained out of this particular class of the primary products of New Zealand, is fully appreciated by the manufacturers themselves, and is recognized by all who are acquainted with the rapidly growing subject of oil technology and its future potentialities. Moreover, it has a special and urgent importance in view of the world-wide need and unsatisfied demand for high-grade fish-oil products.

Whaling, 1944 Season

Five vessels with a total complement of ten men were engaged in the Marlborough Sounds whale-fishery and thirteen men were employed at the shore factory in Tory Channel. A total of eighty-eight humpback whales was taken, from which 440 tons of oil was obtained together with about 100 tons of by-products in the form of steamed bone and meat. The first whale of the season was captured on 2nd June and the last on 17th August. They made their appearance much later than usual and then came "in a heap." The greatest abundance occurred in July, when in one day more whales were seen than had ever been seen before and the record catch of ten whales in one day was made.

A preliminary experiment in canning whale-meat was made at the Picton sardine-factory. A sample tin has been analysed for its nutritional factors by the Nutrition Research Department at the Medical School, Dunedin, with the following results: the pack consisted of 59 per cent. by weight of solid, with 41 per cent. gravy. The solid portion contained 28·1 per cent. protein, 2 per cent. fat, 64·8 per cent. water: caloric value (by calculation), 130·9 calories per 100 grams ($3\frac{1}{2}$ oz.). The vitamin B_1 content was 35 micrograms, and the riboflavin (one of the B_2 series), 320 micrograms per 100 grams. As regards flavour, in spite of a certain amount of prior prejudice, those who tasted it reported that "it tasted good—just like ordinary steak," a verdict that I can corroborate from a trial made by myself and family on canned whale-steak many years ago. It has been estimated that there are, on the average, 3 tons of meat suitable for canning on each whale carcass. This would provide an average seasonal yield of over 200 tons of very good nourishment. In this protein-starved world of to-day it would seem to be a duty to make special efforts to prevent this and other formerly scrapped products from going to waste.

Rock Oysters

Adverse weather and scarcity of skilled labour increased the working difficulties of oyster-picking for the 1944 season. However, a total yield of 6,386 sacks was obtained, which exceeded the 1943 output by 558 sacks and was the highest since the 1926 season. Picking was commenced at Kaipara on 8th May, and in other areas a week later. The last oysters of the season were picked at the Bay of Islands on 8th August.

The yield of oysters from the various areas was as follows: Bay of Islands, 2,492; Whangarei Harbour, 133; Kaipara Harbour, 1,277; Coromandel, 650; Great Barrier, 198; Hauraki Gulf, 1,636. The quantities obtained from the several areas of Hauraki Gulf were Tamaki Strait, 198; Rakino, 170; Motutapu, 19; Waiheke, 412; Ponui, 716; Pakatoa, 24; Noisies, 97 sacks.

Oyster-cultivation for the Year ended 31st March, 1945

Area.

I. Bay of Islands: 1,300,000 borers and 9,800 pupu destroyed, 157 square yards of rock cleared of dead shell, 5,809 square yards cleared of grape-weed, &c. Cost, £580 0s. 6d.

II. Whangarei Harbour: 318,000 borers destroyed, 749 square yards of rock cleared of dead shell, 816 square yards cleared of grape-weed, &c. Cost, £50 7s.

V. South Shore, Tamaki Strait: 233,000 borers and 164 pupu destroyed, 202 square yards of rock cleared of dead shell. No cost.

VI. Coromandel: 1,090,000 borers and 2,240 pupus destroyed, 12,510 square yards of rock cleared of grape-weed, &c. Cost, £53 6s.

XIII. Waiheke: 839,000 borers and 441 pupu destroyed, 622 square yards of rock cleared of dead shell. No cost.

XIV. Ponui: 416,000 borers and 196 pupu destroyed, 346 square yards of rock cleared of dead shell. No cost.

XVI. Great Barrier: 552,000 borer destroyed and 428 square yards of rock cleared of dead shell. Cost, £91 18s.

Total for all areas: 4,748,000 borers and 12,841 pupu destroyed, 2,504 square yards of rock cleared of dead shell, 18,135 square yards cleared of grape-weed, &c. Cost, £775 11s. 6d.

Dredge Oysters: Foveaux Strait, 1944

The 1944 season was less successful than that of the previous year, the same number of vessels producing 63,949 sacks, as against 73,119 in 1943, a difference of 9,170 sacks. To a great extent this can be attributed to bad weather, particularly in the month of June, when it was possible for the vessels to dredge only on five days instead of the usual sixteen to twenty days. The catch for June was thus 2,013 sacks in place of the usual 7,000 to 9,000 sacks for a normal month. Some of the decreased catches may also have been due to the fact that for a considerable part of the season the fleet was operating on the more distant grounds, which allowed less time for dredging. Four vessels exceeded the 7,000-sack limit fixed by the terms of the Bureau of Industry's license, but were allowed to continue dredging for the balance of the season west of the Barracouta Head – Gull Rock Line. In accordance with the policy recommended in the report on the 1943 season, it had been decided to adhere to the limit and to stop each vessel operating when the 7,000-sack total was reached. Representations were made, however, by the representatives of the oyster men and oyster merchants, and after some discussion it was agreed to allow the usual easement on condition that the parties concerned co-operated with the Department in carrying out a partial survey of those portions of the Straits outside the usual oyster areas during the 1945 season. This survey was commenced in February, 1945, and a report on the results will be given in the next annual report.

Toheroas

Good stocks of toheroas have been maintained on the North Kaipara, Muriwai, and Waitarere Beaches. The occurrence of beds consisting of exceptionally large-sized individual molluscs has been noteworthy, more especially on the North Kaipara Beach. The toheroa population on the Ninety-mile Beach, on the other hand, is in a condition that is deplored by those locally interested, and a matter of some anxiety to the Department. The beds are fewer and more sparsely populated and toheroas of takeable size are fewer than at any time since they came under the administration of this Department. As to the reasons for the deterioration, various causes have been ascribed. The ascertainable facts that appear to be most relevant are as follows (they are not given in order of importance, because it must be admitted that departmental observations and supervision in this remote area have never been adequate to provide the first-hand knowledge of the condition of the resources and the manner and degree of their exploitation that is necessary for proper and prompt measures of control; the wartime period has inevitably added to this handicap): one new factor in the situation has been the stationing of comparatively large bodies of Army and Air Force units in the neighbourhood of the Ninety-mile Beach following the outbreak of war with Japan. According to some reports, the toheroas provided a very much appreciated addition to their daily rations and suffered considerably from their depredations. This was in addition to the not inconsiderable toll taken by local residents and by the cannery diggers. Although the abstractions made by these last two agencies may have been no greater than had been customary in the past, it constituted a larger proportion of the available stock, because the toheroa population had not very appreciably recovered from the 1938 mortality, when millions of the molluscs died in a few days from natural causes. Moreover, the existing beds contained a relatively small proportion of full-grown toheroas, with the result that, in order to obtain the same bulk of toheroa-meat, either for private consumption or for canning, a much larger number of individuals was destroyed. The regulation size limit, above which no toheroa may be legally taken, is 3 in., and there can be no doubt but that the general observance of this regulation would prevent any serious depletion of the beds. However, in the absence of any law-enforcing agency on the spot, or even of frequent patrols of the beach by a Fisheries Officer, this regulation was undoubtedly disregarded to an appreciable though unknown extent.

There is further good reason for the view that, apart from the depleting effects of human predators, the toheroas in this area have been subjected to adverse natural conditions which have induced their disappearance or at least checked their growth and reproduction in recent years. The most obvious of these natural factors has been the invasion of the toheroa territory by vast numbers of the bivalve locally known as the *tuatua* (the common *pipi* of the Wellington district), which was mentioned in last year's report. The species is closely related to the toheroa, but has a thicker shell and does not grow to such a great size. As they get older these *tuatuas* tend to move out to below the low-water line, but up to a length of about 2 in. they live in about the same position on the beach as the toheroa, and their competition for space and food must be of serious effect upon the toheroas in the same habitat.

In order to conserve the existing stock of toheroas on this beach, so far as human abstractions are concerned, a year's close season, ending 31st March, 1946, has been prescribed by regulation. Fortunately, the question of depriving the local people of their sea-food, particularly desirable as an alternative to meat rations under present conditions, does not arise, because in the place of the toheroa there are vast quantities of its near relative, the *tuatua*, that will provide them with as much bulk of equally nourishing and, according to many, equally palatable protein food.

Other Shell-fish

Mussels

Although edible mussels occur on many parts of the coast in both Islands, it is only in the Auckland district that a commercial industry of appreciable importance has been developed. The ports concerned are Auckland, Thames, and, to a less extent, Coromandel, where, however, a mussel cannery operates for part of the year. The mussel-beds of greatest extent and of most importance, in that they produce shell-fish of large size and of best quality, are in the vicinity of Coromandel Harbour. These beds have been intensively exploited by dredging operations in recent years, with the result that they have become relatively depleted, and it has been decided to close the area to dredging for a period of three years. A regulation to this effect came into force on 3rd May, 1945. There are various other mussel-grounds in the Hauraki Gulf and Thames Firth, but, generally speaking, they do not produce such large and well-conditioned mussels as those abreast of Coromandel. One dredging vessel works out of each of the ports, Auckland, Thames, and Coromandel, where for the year 1944 the landings amounted to 9,742, 3,135, and 2,513 sacks respectively, with a total value of £6,080. The total annual landings rose from 12,869 sacks in 1938–39 to a maximum of 20,449 sacks in 1941–42, since when there has been each year a decline to the total of 15,390 sacks for 1944.

Paua

This New Zealand shell-fish is the species *Haliotis iris* belonging to a family that is represented in many other seas. Closely similar species occurring on the coast of California provide the commercially important *abalone*, of which over 1,700,000 lb. was marketed in that State in the year 1941. Only a few amateur connoisseurs of sea-foods have hitherto been interested in our New Zealand abalone so far as its gastronomic value is concerned, though for many years the shells have been utilized in the manufacture of various ornamental articles. However, the paua has now definitely made its debut among our marine products of commerce. In the last three months of 1944 from the operations of one licensed fisherman 5,068 shells were obtained. There is nothing new about this, except that the paua-shell exploitation of earlier years has not appeared in any statistical records. What is new, however, is that the meat from 3,900 pauas found its way into the food market. There appears to be every likelihood that the future will see an increasing consumption of this particular foodstuff. It behoves the Department to take such measures as may be necessary to prevent depletion of supplies and to ensure full utilization of the shell-fish. To take pauas for the sake of the shell alone or for the meat alone, and waste the rest, is the sort of unsound economy, from every point of view except that of individual self-interest, that has figured far too much in the past history of our commercial fisheries, to the ultimate detriment of our national resources.

Whitebait

The table given below summarizes the information obtained from the principal whitebait-fishing centres for the 1944 season:—

Whitebait Fishery, 1944 Season

Inspector's Centre.	Rivers fished.	Method of Fishing.	Fishing began.	Best Month.	Number of Fishermen. (Approximately.)		Total Quantity caught (approximately).
					Whole Time.	Part Time.	
							Cwt.
Auckland ..	Waikato	Hand-nets ..	July ..	November ..	..	..	1,073
Auckland ..	Kaituna	Hand-nets ..	July ..	September–October	17	12	82
Auckland ..	Rangitaiki, Tarawera	Hand-nets ..	July ..	August–September	16	..	86
New Plymouth	Waitara, Awakino, Mokau, Waiongona, Mimi, Waiwakaiho, Urenui, Henui	Hand and set nets	July ..	October ..	..	175	53
Wanganui ..	Turakina, Kai Iwi, Wanganui	Hand-nets ..	September	October ..	..	14	10
Napier ..	Tukituki, Ngaruroro	Hand and set nets	July ..	October ..	6	90	80
Blenheim ..	Wairau, Omaka, Opawa, Tuamarina	Hand-nets ..	1st August	September–October	4	..	31
Christchurch	Waimakariri, Ashley, Saltwater, Rakaia, Opihi, Rangitata, Avon, Hurunui, Waiau, Waipara, Halswell, Styx	Hand and set nets	August ..	October–November	67	240	250
Dunedin ..	Molyneux, Taieri, Puerua, Owaka, Waikawa, Shag, Waikouaiti, Kakanui, Wainakarua, Pleasant, Tokomairiro, Waitaki	Hand-nets ..	September	October–November	8	16	150
Dunedin ..	Mataura, Oreti, Titiroa, Otakau, Aparima, Waiau	Hand and set nets	August ..	October–November	22	33	175
Wataroa ..	Big Wanganui, Paringa, Jacobs, Mahitahi, Waitoto, Haast, Little Wanganui, Karangarua, Wataroa, Waitangi, Maori, Moeraki	Set-nets ..	September	October ..	98	10	2,210
Hokitika ..	Hokitika, Mahinapua Creek, tidal creeks at Three-mile, Arahura, Awatuna	Set and hand nets	September	October ..	22	85	860
Greymouth ..	Teremakau, Grey ..	Hand-nets ..	August ..	October ..	..	150	152
Westport ..	Buller, Orawaiti, Nile, Totara, Little Wanganui, Mokihinui, Karamea	Hand-nets ..	August ..	October ..	50	60	723
Takaka ..	Takaka	Hand-nets ..	July ..	September ..	3	8	37
Motueka ..	Motueka, Moutere ..	Hand-nets ..	August ..	October ..	12	12	200
				Total ..	..	..	6,172

The estimated total this year exceeds 6,000 cwt., the highest registered since these returns were first collected and recorded in 1932. The exceptionally good fishing of the 1943 season (estimated total, 5,002 cwt.) has thus been surpassed, and again Westland has made the biggest contributions to the supply. The heaviest catches have come from the rivers of the extreme south of Westland, where, with improved transport, in which the airplane plays an important part, a substantial whitebait industry is becoming developed. Supplies from other west coast rivers were erratic owing to frequent weather disturbances but there were exceptionally heavy catches from the Westport district in October which glutted the market and brought down prices for a time. The return for the Waikato River also shows increased production, more in keeping with past records for this river. In general, the runs of whitebait appear to have been well above the average of recent years, but in the North Island fishing was often checked by wind, rain, and frequent floods. In Otago and Southland the season opened promisingly but was often affected by bad weather, while in Canterbury and Marlborough the runs were later, probably affected by low water temperatures, but with good fishing in the latter part of the season the total yield was more satisfactory than the average of recent years.

These local, seasonal, and annual variations in the whitebait-fishing will doubtless be better understood when more precise—that means mainly more quantitative—information is available. Such will be greatly helped when the long-contemplated and generally approved scheme for licensing the fishery is put into operation. As an example of the cross-currents of opinion that are brought to bear on the subject, it may be mentioned that the council of an acclimatization society recommended that a retail price limit should be fixed so that people would have less inducement to catch whitebait, with the object of conserving the species and thus provide more food for trout. Strong representations have been made by another individual who is firmly convinced that the diminished abundance of whitebait compared with that of former times is entirely due to the establishment of trout in our rivers. The two views thus coincide with regard to ecological relations, but are absolutely antagonistic on consequential policy in the sphere of administration. Both views take in only a portion of the picture. As in all fishery problems, there is a complex of factors to be considered, and the only way to a satisfactory solution for the guidance of administrative policy is through a knowledge of facts—a sorting out and measuring up of the factors by scientific investigation.

Fresh-water Eels

It is probable that the total weight of all the eels that inhabit the rivers and lakes of New Zealand exceeds that of all the remaining species of fish—native and acclimatized—put together occurring in the same waters. And it is more than probable that if one considered the sum total of nutritional value that is available in our fresh-water eel stocks, the comparison would be still more in its favour. In the past they occupied a particularly important place in the food supplies of the Maori, and in various waters their historic eel fisheries are still carried on, though in a smaller way and usually modified to some extent by the use of modernized equipment. However, these fish have not yet become the object of an established and regular commercial fishery for the market, and for that reason eel fishery has had no part in the administrative functions of the Marine Department. Not as a natural asset, but from its nuisance aspect as a well-known predator of trout, the eel has been the concern of some of the acclimatization societies as the local bodies responsible for the maintenance of acclimatized fish that provide sport for anglers.

It was in connection with an organized " drive " against the eel population of the principal eastern tributaries of the Oreti River, undertaken by the Southland Acclimatization Society, that the first good opportunity was offered for a scientific investigation of the eel as a member of the New Zealand fish fauna. In collaboration with eel trappers employed by the society, Mr. D. Cairns, Fresh-water Biologist on the staff of the Marine Department, was able to collect numerous representative samples and to make systematic observations in the field followed by study of material in the laboratory during the year 1937–38(1). These large-scale observations, followed by investigation of the eel fauna of other waters, more especially in the Wellington and Waikato districts, provided the material for his paper on " The Life-history of the Two Species of New Zealand Fresh-water Eels "(2).

The next departmental action in connection with the subject of eels was in the early months of 1942 when Mr. D. F. Hobbs, Fresh-water Biologist, undertook an intensive survey of the eel stocks of the waters of Lake Ellesmere and Lake Forsyth more especially for the purpose of determining the numbers of the mature fish that congregate there on their way to the sea for the autumn spawning migration. The main immediate object was to get an idea of the quantity of eels that would be available for commercial fishery in view of the possibility that alternative sources of oil supply might require to be sought on account of lack of imported oils owing to the then precarious condition of the shipping situation. Dr. Shorland, of the Chemical Section of the Department of Agriculture, collaborated in making determinations of the quantities and qualities of the oil yield from different classes of eel. The amount of oil in the body of New Zealand eels has been found to vary from 7 per cent. to 16 per cent. (average, 12 per cent.) of the total body-weight.

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(1) See annual reports of Marine Department (Fisheries) for the years 1937–38 and 1938–39.

(2) *N.Z. Journal of Science and Technology*, Vol. 23, No. 23, pp. 53B–72B (1941); 4B, pp. 132B–148B (1942); 5B, pp. 173B–178B (1942). (This paper would have been published earlier as a Marine Department Fisheries Bulletin but for the wartime difficulty about paper supplies.)

Unfortunately, the disorganization and disruption of the Agriculture Chemistry Laboratory and staff, brought about by the removal of the main body of personnel and equipment from Wellington and the transfer of the workers to other tasks, have greatly impeded this work and vitamin determinations of oil samples from this collection have not yet been made. The vitamin A content determined by earlier analyses showed values ranging from 200 to 400 International Units. The body oil of eels also contains appreciable amounts of vitamin D. In respect of these two fat-soluble vitamins, eel oil is regarded as equivalent to about half its volume of standard cod-liver oil.

It is the presence of these fat-soluble vitamins in addition to the first-class proteins that puts eel-flesh in the class of *protective* foods and enhances its value at a time of world-shortage of such foods.

The question of the possibility of drawing upon our eel resources, seeing that practically all our other kinds of food-fish were already exploited to the full, arose again early in 1944 in connection with an effort to collect such subsidiary flesh foods as were immediately available in the Dominion to augment the meat rations of the British Isles, the exiguousness of which was giving rise to anxiety.

From his investigation of the eel population of Lake Ellesmere in March, April, and May of 1942, the season when mature eels muster for their migration to the ocean, Mr. Hobbs estimated that the quantity assembled at the Taumutu end of the lake was not less than 550 tons. A similar aggregation, probably not so large, occurs each autumn in Lake Onoke (Lower Wairarapa), but it is generally considered that the numerous lakes in the Waikato system carry a total eel population that exceeds by far the available stock in any other district. An idea of the quantities that can be caught by working eel-traps in certain rivers is given by the record(1) of the catch of two men operating on the Hedgehope, Dunsdale, and Otapiri streams, in Southland, from November, 1937, to March, 1938, when 38,000 lb., or about 17 tons, were taken in these five months. They used fifty traps, which cost about £30, and labour cost about £200. In this case, which was a matter of systematically removing the eel fauna from trout waters, the *quantity* caught in relation to time period was not the main consideration. On the basis of those figures the cost of production would be about 1½d. per pound. From the same data it has been estimated that a yield of 250 tons to 600 tons is obtainable from a square mile of river water. It seems probable that there are many river systems in the Dominion that would be equal in eel production to these tributaries of the Oreti River.

This section might perhaps be misleading if one did not make reference to the fact that there have been in the past various efforts to commercialize these fish which have been abandoned after trial. They have been salted, frozen, and canned, and from time to time consignments have been shipped to England. It would appear that none of these enterprises was sufficiently profitable to encourage continuance. The reasons are not hard to find. One is that the tentative exporters were individuals who were not accustomed to handling fish supplies and were not provided with suitable accommodation and equipment for the purpose. There would have been a better chance for the maintenance of an eel trade as a side-line to an established fish-dealing business, but those already in the fish trade were making bigger and easier profits out of well-known and popular kinds of sea-fish. This has been the reason for the non-utilization—in fact, the waste—of considerable quantities of nutritious and palatable but little-known varieties of fish in the past, a state of affairs that has been recently altered by the wartime shortages of our principal market fish. There was also an absence of established professional eel-fishermen such as are to be found in other countries where these fish are a regular article of trade. The collection and transport to a suitable depot were also neither simple nor inexpensive. However, there have been recent developments which suggest that there are the beginnings of an internal market for the sale of eels fresh, smoked, and in the *a la carte* condition in a restaurant; and, as already mentioned (p. 17), there were exports of frozen eels, mainly if not entirely to Australia, in 1944 to the value of £356. These are only small bucketfuls out of the well of total supply available, and the main purpose of this section is to suggest that it might be a useful contribution to UNRRA from the Dominion if a serious organized effort were made to utilize our fresh-water eel resources to provide a foodstuff that might be substantial in bulk, as it is undoubtedly first class in quality at any rate, according to the standards (more rational than ours) of those whose need is great and urgent among the starving populations of Europe.

Quinnat Salmon

The Hakataramea Hatchery again remained inoperative in the winter of 1944 so far as the Department was concerned, but was placed at the disposal of the two local acclimatization societies to be used in their collaborative scheme for the recruitment of trout stocks in their waters. Mr. R. A. Irvine, a former member of the Department's hatchery staff, after his discharge from the Army, was employed by the societies for trapping and hatchery operations. In the course of this work he also obtained a small quantity of quinnat salmon ova which were intended for shipment to Melbourne to meet a request made by the Victorian Government. Unfortunately the infrequent and irregular steamer service prevented this from being done.

The fishing season covering the early months of 1945 was marred by abnormally severe and continuous floods in the big Canterbury rivers, and even in the smaller rivers the periods when salmon-angling was possible were few and brief. Only seven licenses to sell were taken out by anglers, and and one net-fishing license was issued for the Waimakariri River.

(1) Cairns: *Op. cit.*, p. 176b.

The table below shows the fishing results as given by licensees' returns :—

—	Males.	Females.	Sex not given.	Totals
Returns from Rods				
Ashburton River, 14/3/45 to 21/3/45 (one rod)—				
Number of fish caught ..	1	2	..	3
Total weight ..	18 lb.	37 lb.	..	55 lb.
Average weight ..	18 lb.	18·5 lb.	..	18·33 lb.
Rangitata River, 24/3/45 to 4/4/45 (one rod)—				
Number of fish caught ..	4	..	..	4
Total weight ..	79 lb.	..	..	79 lb.
Average weight ..	19·75 lb.	..	..	19·75 lb.
Rakaia River, 6/3/45 to 29/4/45 (three rods)—				
Number of fish caught ..	11	8	7	26
Total weight ..	166 lb.	148 lb.	119 lb.	433 lb.
Average weight ..	15·09 lb.	18·5 lb.	17 lb.	16·65 lb.
Opihi River, 6/2/45 to 28/3/45 (two rods)—				
Number of fish caught ..	..	..	22	22
Total weight ..	..	..	347 lb.	347 lb.
Average weight ..	..	..	15·8 lb.	15·8 lb.
Combined rivers, 6/2/45 to 29/4/45 (seven rods)—				
Number of fish caught ..	16	10	29	55
Total weight ..	263 lb.	185 lb.	466 lb.	914 lb.
Average weight ..	16·4 lb.	18·5 lb.	16·06 lb.	16·6 lb.
Returns from Nets				
Waimakariri River, 8/3/45 to 29/3/45 (one net)—				
Number of fish caught ..	12	6	..	18
Total weight ..	138 lb.	87 lb.	..	225 lb.
Average weight ..	11·5 lb.	14·5 lb.	..	12·5 lb.

The total legally saleable catch is the lowest on record. Nevertheless, the average catch per rod of 130 lb. of salmon is somewhat higher than the 1944 season's average of 127 lb. for eleven rods. Except in the Opihi, where five fish were caught by one licensee in February, not a fish was taken earlier than 6th March, which is when the salmon runs normally have passed their peak. All the fish netted in the Waimakariri were taken after 7th March.

An observant angler who has fished the Rangitata since 1914 considers this year's failure to be due to a great extent to the effects of the damage done by a bad flood which occurred four years ago and " washed out all the salmon spawn-beds." From the incidence of a " perfect spawning season " the following year he forecasts a good salmon season for 1946.

Atlantic Salmon

The trap, located at the usual site in the Upukerora River, was completed on 24th April, and 9 salmon were taken by the end of the month. The subsequent captures for hatchery purposes for the months of May to August inclusive were 65, 137, 25, and 11 respectively, giving a total of 247 (115 males and 132 females), from which 299,250 ova were stripped. The majority of the fry hatched were liberated in the Upukerora River, 50,000 being put into Henry Creek, a smaller tributary stream of Lake Te Anau. Pond-reared fish numbering 7,149 were liberated as yearlings in the shallow bay of the lake adjacent to the hatchery.

Angling results have been poor for the 1944–45 fishing season. Heavy rainfull and a continuously high river prevented successful angling in the Waiau River between the two lakes, and the lake fishing was not so good as usual.

Fresh-water Research

As mentioned in the report for last year, the absence in the Armed Forces of the two biologists has compelled a cessation of the investigations that were in train. The intensive study of the trout population of the Horokiwi River undertaken by Mr. K. R. Allen had been carried to the completion of its first stage. The comprehensive ecological observations, carried out over a two-year period to give a complete picture of the existing conditions, were intended to be followed by an experimental phase designed to indicate, and measure, the effects of artificial aids for augmenting the trout stock. The interim report on this work, which he had made with a view to its publication as an Appendix to the annual report on fisheries for the year 1941–42, could not be printed owing to the shortage of paper prevailing at the time. A brief account of the investigation is given in that annual report, but this also, unfortunately, did not obtain the circulation that had been the rule under pre-war conditions because the same paper shortage precluded the printing of separate reports on fisheries which had formerly been available, especially for circulation to acclimatization societies. This was particularly regrettable, because the financing of fresh-water research had been provided for out of the contribution to the Consolidated Fund of 10 per cent. (reduced to 5 per cent. in 1942) of the moneys paid for fresh-water fishing licenses.

Mr. Allen's report is to be published as an Appendix to the reprint of the fisheries portion of this annual report, and though its appearance is belated for the unavoidable reason explained above, it will, I trust, be appreciated as throwing light on the conditions of trout-life in a typical angling stream which is of primary and fundamental importance as a basis for subsequent developments in the direction of trout-fishery improvement. It is essential that such measures should be based on a scientifically established understanding of the whole biological relationship of a trout population to its environment at all stages of its life-history.

To provide information complementary to his own biological investigations, Mr. Allen, in collaboration with a number of regular anglers in those waters, had organized a scheme for obtaining what has been called in America a "creel census." This scheme has been maintained in the absence of Mr. Allen, for whom our laboratory assistant, Miss Josephine Russell, has acted as a keen and capable deputy, keeping in touch with the team of trout-fishermen, who have kindly continued to co-operate by sending regular records of the results of their fishing to the laboratory. The following statement, prepared by Miss Russell, shows the recent progress and the summarized results of this collaboration :—

Horokiwi Stream : Angling Results, 1943–44

The following are the principal results of the 1943–44 season, which was the fifth during which angling conditions in the Horokiwi have been studied. Information was received from 23 anglers who had fished the Horokiwi either in this or in earlier seasons. Of these, only 8 fished there in 1943–44, a slight increase from the previous season, but a great drop from the numbers fishing there before the influence of the war became pronounced. The main features of the returns are given below.

Quantity of Fish.—The 8 anglers known to have fished there caught 52 takeable fish in the Horokiwi. It is probable that these returns are fairly complete and that the total catch was about 60. The weight of these 60 fish was probably about 54 lb. The number and weight of fish caught in the last five seasons has been :—

—	1939–40.	1940–41.	1941–42.	1942–43.	1943–44.
Number	400	350	270	30	60
Weight (lb.)	375	340	275	31	54

Catch per Hour.—The records show 52 fish caught in 110 hours, an average of 0·47 fish per hour or one fish every 127 minutes. This is an improvement over the figure for the previous season, although not as good as some earlier ones. As the average rate of catch varies quite considerably during the season, and since in the last two years most fishing has been done in October and November, the most reliable comparison is between this part of the various seasons. The following table shows the average time required to catch one fish during the first two months of each of the last five seasons :—

	1939–40.	1940–41.	1941–42.	1942–43.	1943–44.
Minutes	113	90	125	150	116

Thus it appears that 1943–44 can fairly be described as an average season.

Catch per Day.—The average catch for a day's fishing on the Horokiwi has remained steadily at 2½ for the whole five years. No limit bags were recorded.

Size of Fish.—This was slightly down on the previous season, being about 14½ oz. The largest fish recorded was probably rather under 2 lb.

Under-sized Fish.—One hundred and thirteen under-sized trout—*i.e.*, less than 9 in. in length—were caught, forming 68 per cent. of the total catch. This is the greatest percentage of under-sized fish yet recorded for a season in the Horokiwi. The percentages in the five seasons studied have been :—

1939–40.	1940–41.	1941–42.	1942–43.	1943–44.
47	53	58	18	68

This fact may be regarded as a hopeful omen for the coming season, since in the Horokiwi nearly all the under-sized fish caught in one season will reach takeable size during the next, and therefore, in the absence of unfavourable factors, an abundance of under-sized fish one season may mean more numerous takeable ones in the next. However, events during the winter, when it is not now possible to keep the stream under observation, may greatly affect the stock in various ways and so make any reliable forecast impracticable.

Thanks are again due to those anglers whose co-operation during the last five years has enabled a continuous record to be obtained of angling conditions in the Horokiwi. These records will be of great use when active fishery investigations can again be resumed and petrol and other restrictions no longer cut down our fishing.

Marine Research

It has not been possible to break any new ground of importance in connection with marine fishery research. The Biologist, Mr. A. M. Rapson, has continued the observations that were already in train, more especially in connection with his studies of the blue-cod stocks of the Dominion and the sardine fishery of the Marlborough Sounds. He has kept up his periodical examinations of the toheroas on the principal beaches in the North and has also made a first visit to the beds in Te Wae Wae Bay, Southland. Collections of plankton for the study of fish-eggs and larval stages have been made by means of trips on fishing-vessels as opportunities offered. Shark-fishing operations for the identification and other relevant characters of the species utilized for fish-liver-oil production have received attention. Similar observations and collections of shark livers have also been made by the laboratory assistant, Miss Josephine Russell.

A general report on the blue cod and the blue-cod fisheries by Mr. Rapson is nearing completion. It is hoped that the publication of reports on this and on other marine biological work will be possible in the near future.

Staff

Curtailed through war conditions, the last four annual reports have contained no reference to the staff of the Fisheries Branch. The personnel, like the work, may be roughly divided into two classes—viz., (*a*) those dealing with administrative and clerical work at headquarters; and (*b*) those whose work may be described as mainly outdoor, in contact with fishermen, fish, and fish markets, for the purpose of acquiring information and doing such patrolling and policing work as is necessary to ensure the observance of the fishery laws. It should be understood that matters coming under the first heading (administrative and clerical) are dealt with by the secretariat of the Marine Department, with the headquarters fishery officers (the Chief Inspector and the Senior Fishery Officer) acting in an ancillary or advisory capacity. Each of these officers normally divides his time between head office and outdoor duties.

The office staff with duties relating entirely to fishery matters at headquarters consists of three persons making up the Statistical Section and one whose work is shared between the Statistics Section and the care of the library. This group, which before the war comprised three males and one female, has lost all its original personnel and at present consists of one part-time and three whole-time temporary women clerks.

The regular outdoor staff consists normally of a District Inspector of Fisheries stationed at Auckland, Wellington, Christchurch, and Dunedin respectively. In the rock-oyster centres of Auckland, Coromandel, Bay of Islands, Kaipara, and Whangarei there are also permanent Inspectors mainly engaged in patrols for the protection of oyster and sea fisheries.

The Fisheries Laboratory, situated half a mile away from the office building, formerly accommodated three male biologists and one female assistant who combined the functions of laboratory assistant and clerk in charge for matters connected with fishery investigation. The effects of the war have reduced this staff to one biologist (medically rejected for the Armed Services) and the aforesaid woman worker.

The existing Fisheries Branch as a whole may be regarded as a partly intelligence and partly tactical unit. Its primary work in the field and at headquarters is to provide information, which may be commercial, statistical, or biological, that will enable the Department's administrative measures to be based on an appreciation of the situation that is as nearly as possible in accordance with actual and relevant facts. Its further duties, described as tactical, consist in bringing to bear on the various fishery operations and operators those fruits of departmental administrative policy that appear in the form of fishery regulations.

It goes without saying that the repercussions of war on man-power and on travelling facilities have considerably affected the amount and character of the work, especially the functions of inspectorate and research staff. Not one of the four District Inspectors on the strength at the outbreak of war now remains. One enlisted early, and on his return from overseas service took up farming. Another was called upon for more than "whole-time" special duties connected with national security from the date of Italy's entry into the war, subsequently joining the Navy, and is now overseas. I regret to record that the other two have been taken by death. The late Captain Charles Daniel died at Auckland on 5th March, 1944. He had served the Department as an Inspector of Fisheries there since 1923, having previously been engaged in the Mercantile Marine Branch at that port. From his remarkable knowledge of the waters, coasts, fishermen, and the whole nautical population of the Auckland Provincial District, and by virtue of his extraordinary physical and mental energy and commanding personality, Captain Daniel was a most valuable member of our staff, and his sudden death left a void difficult to fill; but in Mr. G. Migan, the officer promoted to the vacancy, the Department is fortunate to have a man well tried and experienced, whose acquaintance with every aspect of the rock-oyster industry is especially valuable. He, together with the local Inspectors at Coromandel, Kaipara, Bay of Islands, and Whangarei, and the overseers and oyster-picking teams, merit special commendation for the very successful rock-oyster harvest of the 1944 season, achieved in spite of the many difficulties arising from shortage of skilled labour and adverse weather. The late Maurice Hope had served the Department as District Inspector of Fisheries with headquarters at Christchurch since August, 1939, and before that date had held warrants as a Fisheries Officer while engaged as Ranger to the Marlborough Acclimatization Society. During the war years, while special and additional duties were imposed and the means for undertaking them were restricted and reduced, Mr. Hope carried out his work capably and conscientiously, devoting his time and energies without stint. Like his Auckland colleague, he was in harness up to the day before death overtook him. He died on 11th November, 1944. The vacancy has been filled by the temporary appointment of Mr. F. Bennington. The post of District Inspector of Fisheries for Otago has been capably filled by Mr. F. McIvor since the enlistment of

Mr. I. A. Macfarlane in 1940. The position at Wellington is still vacant. The work of my headquarters colleague and deputy, Mr. M. W. Young, Senior Fisheries Officer, has been in the main connected with various special wartime developments which affect the fishing industry in relation to matters administered by other Departments. He has represented the Marine Department as adviser to the Bureau of Industry in connection with the licensing of fishermen and other members of the fishing industry under the Industrial Efficiency Act, to the Oil Fuel Controller, the Food Controller, and defence services, and during the current year to an increasing degree he has been largely responsible for providing information on the fishing industry to the Rehabilitation Department and its ancillaries. The fundamentally important work of the Statistics Section has been carried on under Mr. Young's supervision. With regard to this part of the branch, the excellent services rendered by Miss A. E. White, in charge of the Section, merit a special word of appreciation.

A. E. HEFFORD,

27th July, 1945. Chief Inspector of Fisheries and Director of Fisheries Research.

TABLE I.—SHOWING THE NUMBER OF FISHING-VESSELS AND THE NUMBER OF FISHERMEN AND OTHER PERSONS ENGAGED IN THE INDUSTRY AT EACH PORT FOR THE YEAR ENDING 31ST DECEMBER, 1944

Name of Port or District.	Vessels licensed 1st January, 1943–31st December, 1944.			Vessels engaged in Fishing for Wet Fish.										Vessels engaged in Shell-fishery.						Number of Persons employed.					
				Steam Trawlers.		Motor Trawlers.		Motor-vessels Danish-seining.		Motor-vessels, Set-net and Line Fishing.		Rowing-boats.		Oyster-dredging Vessels.		Mussel-dredging Vessels.		Crayfishing Vessels.		Fishermen.		Others.		Total.	
	Total Number.	Number Fishing.	Number not Fishing.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.	Whole Time.	Part Time.
North Island																									
Awanui and district	16	12	4	..	..	..	..	..	..	3	8	..	1	..	..	..	..	..	..	9	10	7	6	16	16
Mangonui	15	10	5	..	..	..	..	..	..	..	10	..	..	..	..	..	..	..	1	..	10	..	..	..	10
Whangaroa	10	10	..	..	..	..	..	..	..	..	7	..	3	..	..	..	..	..	2	..	15	..	..	..	15
Russell	45	30	15	..	..	..	..	..	..	3	24	..	3	..	..	..	..	..	4	4	38	3	1	7	39
Whangarei	21	16	5	..	..	..	..	..	..	5	10	..	1	..	..	..	..	2	1	18	14	2	2	20	16
Auckland	85	71	14	..	1	..	..	37	4	4	19	..	3	..	..	1	..	3	3	142	49	132	22	274	71
Kaiana	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	1
Thames	30	24	6	..	..	..	..	1	1	14	6	..	1	..	..	1	..	..	..	36	13	23	1	59	14
Coromandel	7	5	2	..	..	..	..	..	..	..	2	..	1	..	..	..	1	1	..	4	4	..	6	4	10
Mercury Bay	5	4	1	..	..	..	..	..	..	2	2	..	..	..	..	..	..	2	1	3	3	4	..	7	3
Whangamata	6	4	2	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	1	..	4	..	..	..	4
Waihi Beach	11	9	2	..	..	..	..	..	..	..	8	..	1	..	..	..	..	..	3	8	9	..	..	8	9
Tauranga and district	40	25	15	..	..	..	..	1	..	8	18*	..	..	..	..	..	..	..	3	19	41	9	6	28	47
Whakatane	6	5	1	..	..	..	..	1	..	2	2	..	..	..	..	..	..	..	2	6	2	2	2	8	4
Ohiwa Harbour, Opotiki, and Cape Runaway	8	5	3	..	..	..	..	..	..	1	3	..	1	..	..	..	..	..	..	2	4	..	..	2	4
Gisborne	15	11	4	..	..	3	..	..	..	1	2	..	..	..	..	..	..	1	6	12	6	3	1	15	7
Napier	34	33	1	1	..	11	9	1	..	..	12	..	4	..	..	..	..	3	11	41	24	12	4	53	28
Castlepoint	6	3	3	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..	3	..	..	..	3
Wellington	42	29	13	..	1	..	1	..	..	12	4	2	1	..	..	..	..	5	3	67	29	27	..	94	29
Makara	2	2	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..	2	..
Paremata	15	8	7	..	..	..	..	..	..	5	3	..	..	..	..	..	..	..	3	10	6	..	..	10	6
Paraparaumu Beach	5	4	1	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	2	6	..	..	2	6
Manawatu Heads	13	8	5	..	..	..	..	..	..	..	1	..	7	..	..	..	..	..	..	..	8	..	..	..	8
Tangimoana	4	3	1	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	5	..	..	..	5
Wanganui	15	8	7	..	..	..	..	..	..	..	7	..	1	..	..	..	..	..	..	..	12	..	..	..	12
New Plymouth	14	9	5	..	..	..	..	..	..	..	9	..	1	..	..	..	..	..	4	3	7	..	..	3	7
Kawhia	2	2	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	2	..	..	1	2
Raglan	6	5	1	..	..	..	..	..	..	1	4	..	..	..	..	..	..	..	..	1	5	..	..	1	5
Manukau Harbour	18	12	6	..	..	..	..	..	..	3	6	..	2	..	..	..	..	..	1	4	12	..	..	4	12
Kaipara	22	18	4	..	..	..	..	..	..	12	5	..	1	..	..	..	..	..	..	13	6	6	..	19	6
Hokianga	9	9	..	..	..	..	..	..	..	1	6	..	2	..	..	..	..	..	..	4	8	..	..	4	8
South Island																									
Havelock	22	22	..	..	..	2	10	..	..	1	11	..	..	..	..	..	..	..	..	6	23	..	..	6	23
Picton	19	14	5	..	..	..	..	..	..	7	8	..	..	..	..	..	..	..	..	17	14	19	..	36	14
Blenheim (Wairau)	2	2	..	..	..	2	1	..	..	..	1	..	..	..	..	..	..	..	1	4	..	4	..	8	..
Kaikoura	16	14	2	..	..	..	2	..	..	8	5	..	..	..	..	..	..	1	4	18	5	1	..	19	5
Lyttelton (Christchurch)	24†	17	7	1	..	5	1	..	..	2	5	1	1	..	..	..	..	1	2	28	8	18	..	46	8

Akaroa	23	16	7	..	..	1	2	..	..	..	10	..	3	..	..	..	..	1	4	3	18	1	..	4	18
Lake Ellesmere	24	14	10	..	..	..	..	..	..	3	..	4	7	..	..	..	..	..	..	11	9	..	..	11	9
Timaru	26	25	1	..	..	8	6	2	..	4	10	..	..	..	..	..	..	..	..	30	13	2	..	32	13
Oamaru	9	6	3	..	..	..	..	..	..	5	2	..	..	..	..	..	..	..	..	7	3	1	1	8	4
Moeraki	12	11	1	..	..	..	..	..	..	6	5	..	..	..	..	..	..	2	2	8	5	1	1	9	6
Karitane	9	7	2	..	..	..	..	..	..	..	6	..	..	..	..	..	..	5	2	6	2	..	1	6	3
Port Chalmers and Dunedin ..	48	39	9	1	..	7	5	..	..	12	12	1	..	..	..	..	..	..	2	43	30	32	12	75	42
Taieri North	5	5	..	..	..	1	2	..	..	1	2	..	..	..	..	..	..	..	1	7	2	..	1	7	3
Nuggets	8	7	1	..	..	4	2	..	..	1	1	..	..	..	..	..	..	..	..	8	2	1	..	9	2
Tautuku..	2	1	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..	2	..
Waikawa	4	4	..	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	7	..	1	..	8	..
Invercargill	4	3	1	..	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	..	6	..	..	..	6
Bluff	19	15	4	..	..	..	..	..	..	6	10	..	..	9	..	..	..	..	..	15	19	18	79	33	98
Stewart Island	41	34	7	..	..	..	..	..	..	10	27	..	..	..	..	..	..	..	..	27	36	4	4	31	40
Riverton District	7	6	1	..	..	..	..	..	..	2	3	..	1	..	..	..	..	..	..	4	7	..	..	4	7
Hokitika	2	2	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	3	..	23‡	..	26‡
Greymouth	5	3	2	1	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	5	1	1	1	6	2
Westport	13	6	7	1	2	..	1	..	..	..	2	..	..	..	..	..	..	..	..	2	10	..	6	2	16
Golden Bay	3	2	1	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..	..	3	..	..	..	3	..
Motueka..	13	12	1	..	..	..	..	..	..	3	9	..	..	..	..	..	..	..	1	6	17	3	2	9	19
Nelson	19	15	4	..	..	1	2	3	1	5	9	..	..	..	..	..	..	..	1	17	12	6	..	23	12
French Pass	30	17	13	..	..	..	..	..	..	6	12	..	..	..	..	..	..	..	..	11	22	..	..	11	22
Chatham Islands	8	7	1	..	..	..	..	..	..	2	5	..	..	..	..	..	..	..	..	5	18	3	2	8	20
Totals	945	721	224	5	4	49	45	46	6	168	349	8	51	9	†	2	1	27	69	711	641	346	184	1,057	825

* Includes one purse-seiner. † Excludes fishing-boats licensed for whitebait. ‡ Includes 15 cannery workers employed in South Westland.

TABLE II.—SHOWING THE VARIOUS KINDS OF FISH CAUGHT AND APPROXIMATELY THE TOTAL QUANTITIES OF FISH AND SHELL-FISH LANDED AT THE CHIEF FISHING PORTS FOR THE YEAR ENDED 31ST DECEMBER, 1944

Name of Port or District.	Principal Kinds of Fish caught.	Quantity landed (Fish).	Total Value (Fish).	Shell-fishery (excluding Toheroa).							Grand Total Value.
				Oysters.	Value.	Mussels.	Value.	Crayfish.	Value.	Total Value (Shell-fish).	
North Island		Cwt.	£	Sacks.	£	Sacks.	£	Cwt.	£	£	£
Awanui and district	A, Q, Y, K	1,455	2,226	..	..	..	..	..	..	..	2,226
Mangonui	A, K	513	732	..	..	..	..	3	9	9	741
Whangaroa	A, C	628	898	..	..	..	..	185	304	304	1,202
Russell	A, K, Z, C	2,350	3,199	..	..	..	..	52	100	100	3,299
Whangarei	Q, A, V, Y	4,104	4,262	..	..	..	..	224	458	458	4,720
Auckland	A, B, H, Q, E	111,078	138,872	6,386	9,579	9,742	4,190	1,194	2,507	16,276	155,148
Kaiaua	A	134	187	..	..	..	..	..	..	..	187
Thames	A, E, H	19,691	29,665	..	..	3,135	1,230	..	..	1,230	30,895
Coromandel	A, K	184	247	..	..	2,513	660	93	190	850	1,097
Mercury Bay	A, C	850	1,567	..	..	..	..	798	1,678	1,678	3,245
Whangamata	C	42	79	..	..	..	..	13	25	25	104
Waihi Beach	A, B	486	720	..	..	..	..	23	53	53	773
Tauranga and district	A, Q, B, Y	10,485	11,242	..	..	..	..	86	163	163	11,405
Whakatane	A, B	1,526	2,250	..	..	..	..	31	115	115	2,365
Ohiwa Harbour, Opotiki, and Cape Runaway	A	605	885	..	..	..	..	..	..	..	885
Gisborne	B, H, C	7,703	10,475	..	..	..	..	733	1,316	1,316	11,791
Napier	B, H, F, C	17,865	26,529	..	..	..	..	1,516	2,872	2,872	29,401
Castlepoint	C	53	189	..	..	..	..	..	..	..	189
Wellington	C, G, B, M, O	14,019	33,548	..	..	..	..	2,624	5,772	5,772	39,320
Makara	O, S	351	729	..	..	..	..	103	250	250	979
Paremata	C, O	2,032	5,381	..	..	..	..	31	80	80	5,461
Paraparaumu Beach	A, C	468	997	..	..	..	..	..	..	..	997
Manawatu Heads	A, E	220	653	..	..	..	..	..	..	..	653
Tangimoana	E	9	39	..	..	..	..	..	..	..	39
Wanganui	A	234	435	..	..	..	..	..	..	..	435
New Plymouth	A, C	979	2,116	..	..	..	..	98	127	127	2,243
Kawhia	E, A	189	648	..	..	..	..	..	..	..	648
Raglan	E	218	612	..	..	..	..	..	..	..	612
Manukau Harbour	K, E, A	1,118	1,825	..	..	..	..	46	170	170	1,995
Kaipara	E, K	2,651	5,797	..	..	..	..	..	..	..	5,797
Hokianga	K	1,201	1,370	..	..	..	..	..	..	..	1,370
South Island											
Havelock	E, D	924	4,433	..	..	..	..	..	..	..	4,433
Picton	X, C, N	7,230	10,438	..	..	..	..	23	43	43	10,481
Blenheim (Wairau)	I, F, J	1,293	2,210	..	..	..	..	93	174	174	2,384
Kaikoura	C, G, S	2,105	8,111	..	..	..	..	420	802	802	8,913
Lyttelton	B, J, H, G, E	16,221	42,527	..	..	..	..	303	534	534	43,061
Akaroa	H, C, G	1,696	4,562	..	..	..	..	507	874	874	5,436
Lake Ellesmere	E	991	3,903	..	..	..	..	..	..	..	3,903
Timaru	F, H, J, C, E	13,022	37,759	..	..	..	..	..	..	..	37,759
Oamaru	C, I	1,510	3,257	..	..	..	..	..	..	..	3,257
Moeraki	C, D	1,658	4,728	..	..	..	..	1,747	1,253	1,253	5,981
Karitane	N, D, C	1,093	1,972	..	..	..	..	2,759	2,881	2,881	4,853
Port Chalmers	N, F, I, B, E, C	23,264	38,808	..	..	..	..	38	54	54	38,862
Taieri Mouth	F, C	988	2,968	..	..	..	..	43	42	42	3,010
Nuggets	F, C	2,140	4,540	..	..	..	..	..	..	..	4,540
Tautuku	C	167	391	..	..	..	..	..	..	..	391
Waikawa	F, D	1,564	2,992	..	..	..	..	..	..	..	2,992
Invercargill	D, E	34	59	..	..	..	..	..	..	..	59
Bluff	D, C	3,352	7,813	63,949	47,961	..	..	..	..	47,961	55,774
Stewart Island	D	8,811	20,047	..	..	..	..	..	..	..	20,047
Riverton district	D	615	2,432	..	..	..	..	..	..	..	2,432
Hokitika	W, F	69	145	..	..	..	..	..	..	..	145
Greymouth	F, H, I	617	1,482	..	..	..	..	..	..	..	1,482
Westport	F, C	814	2,013	..	..	..	..	..	..	..	2,013
Golden Bay	A, H, C	419	648	..	..	..	..	11	25	25	673
Motueka	A, H, N	1,358	2,208	..	..	..	..	7	14	14	2,222
Nelson	A, H, E, C	5,541	13,635	..	..	..	..	46	85	85	13,720
French Pass	D, X, C, S	2,880	6,778	..	..	..	..	..	..	..	6,778
Chatham Islands	D, C	4,420	3,721	..	..	..	..	..	..	..	3,721
Totals		308,237	522,954	70,335	57,540	15,390	6,080	13,850	22,970	86,590	609,544

KEY TO SYMBOLS USED

A = Snapper.
B = Tarakihi.
C = Groper.
D = Blue cod.
E = Flounder.
F = Sole.
G = Ling.
H = Gurnard.
I = Red cod.
J = Elephant-fish.
K = Mullet.
L = Moki.
M = Hake.
N = Barracouta.
O = Warehou.
P = John-dory.
Q = Trevally.
R = Pioke.
S = Butterfish.
T = Trumpeter.
U = Whiting.
V = Kingfish.
W = Herring.
X = Sardine.
Y = Kahawai.
Z = Porore.

TABLE IIA.—SHOWING APPROXIMATELY QUANTITIES OF DIFFERENT KINDS OF FISH LANDED AT CERTAIN PORTS DURING YEAR ENDED 31ST DECEMBER, 1944

—	Awanui.	Russell.	Whangarei.	Auckland.	Thames.	Tauranga.	Whakatane.	Gisborne.	Napier.	Wellington.	Paremata.	New Plymouth.	Manukau Harbour.	Kaipara.
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Barracouta	..	1	1	72	..	..	..	..	..	211	..	..	..	..
Blue cod	5	11	2	35	1	3	..	..	4	187	2	3	..	..
"Bonita" (*Brama*)	..	..	..	..	..	..	..	..	..	31	..	..	..	..
Butterfish	..	..	10	438	..	..	..	..	4	327	54	..	..	..
Brill	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Conger-eel	..	..	..	..	..	..	..	..	..	59	6	..	..	..
Elephant-fish	..	..	..	..	..	..	..	..	..	10	1	..	..	..
Flounder	8	63	20	1,857	4,902	12	51	60	166	..	3	..	328	1,337
Frost-fish	..	..	..	..	..	..	..	..	..	4	..	..	..	..
Garfish	..	10	..	17	..	..	..	..	..	..	..	..	..	..
Gurnard	..	7	2	3,206	1,313	3	41	1,244	4,621	2	..	4	..	..
Hake	..	..	..	..	..	..	..	..	..	705	12	..	..	..
Hapuku (groper)	118	80	95	391	..	277	20	289	986	6,714	1,548	148	..	..
Herring	..	..	..	..	..	..	..	..	30	..	..	7	..	..
John-dory	..	..	..	202	..	..	..	59	..	13	..	..	..	..
Kahawai	187	24	654	34	132	732	..	..	61	140	5	66	..	5
Kingfish	11	24	78	84	2	202	..	..	..	63	..	34	1	..
Ling	..	..	..	..	..	..	..	3	8	2,761	3	..	..	..
Mackerel	..	2	..	..	..	155	..	..	..	30	..	..	..	..
Maomao	..	..	2	19	..	..	..	..	..	..	..	..	..	..
Moki	..	..	..	3	..	..	..	87	34	220	86	..	..	..
Mullet	182	184	40	353	..	7	..	..	1	..	..	..	356	920
Parore	18	121	164	9	..	110	..	..	..	..	..	..	..	..
Perch	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pioke	..	..	8	532	564	11	..	..	..	224	56	..	49	2
Red cod	..	..	..	..	..	..	..	6	..	90	..	..	..	..
Sardine	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Skate	..	..	..	..	..	..	..	..	..	48	..	..	..	..
Snapper	734	1,537	1,344	79,844	11,696	4,152	1,235	127	511	332	22	707	274	361
Sole	..	..	..	6	..	..	..	65	1,710	3	..	..	..	..
Swordfish	..	35	8	..	..	192	..	..	..	..	..	..	..	..
Tarakihi	3	46	1	18,289	..	1,057	139	5,641	8,966	999	5	1	..	..
Trevally	189	45	1,552	2,915	956	2,509	28	..	..	52	8	..	58	4
Trumpeter	..	..	..	..	..	1	..	..	..	3	..	..	..	..
Turbot	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Warehou	..	..	..	..	..	..	..	..	..	507	165	..	..	..
Whiptail	..	..	..	..	..	..	..	..	..	11	..	..	..	..
Whiting	..	..	..	..	..	..	..	..	..	32	..	..	..	..
Mixed flat-fish	..	25	..	14	..	44	..	29	17	5	..	..	..	..
Mixed round-fish and kinds not specified	..	135	123	2,758	125	1,018	12	93	746	236	56	9	52	22
Totals	1,455	2,350	4,104	111,078	19,691	10,485	1,526	7,703	17,865	14,019	2,032	979	1,118	2,651

—	Picton.	Kaikoura.	Lyttelton.	Akaroa.	Timaru.	Oamaru.	Moeraki.	Port Chalmers.	Nuggets.	Waikana.	Bluff.	Stewart Island.	Westport.	Nelson.	French Pass.	Chatham Islands.
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Barracouta	777	2	186	2	3	..	27	6,300	..	..	3	..	..	154	43	..
Blue cod	267	37	21	1	3	167	369	304	40	160	2,835	7,670	..	202	1,254	4,248
"Bonita" (*Brama*)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Butterfish	113	77	3	2	..	..	..	..	..	..	38	..	..	1	269	..
Brill	..	..	..	1	..	..	..	42	..	..	..	..	..	..	..	..
Conger-eel	25	..	..	..	..	..	..	..	..	..	..	..	..	6	29	..
Elephant-fish	..	1	2,611	97	1,795	..	..	629	1	..	..	..	..	4	..	..
Flounder	..	9	813	164	1,600	..	..	1,163	133	..	94	..	13	906	..	..
Frost-fish	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Garfish	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gurnard	4	5	2,537	358	2,265	..	..	279	..	..	..	..	19	1,444	2	..
Hake	..	15	117	4	..	..	92	67	..	..	..	..	..	..	15	..
Hapuku (groper)	1,856	957	397	306	1,635	970	1,103	960	157	64	145	312	122	324	448	172
Herring	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
John-dory	..	9	..	..	..	..	4	28	..	..	..	..	..	165	..	..
Kahawai	50	..	..	..	..	..	2	1	..	..	..	..	..	6	2	..
Kingfish	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ling	2	752	1,556	265	1,568	24	25	627	..	1	..	..	6	2	..	..
Mackerel	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..
Maomao	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Moki	5	22	129	6	..	..	..	43	..	..	..	..	..	..	10	..
Mullet	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Parore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Perch	..	..	..	..	..	..	11	..	..	..	..	643	..	3	5	..
Pioke	2	..	4	1	4	..	..	268	..	..	..	..	..	153	..	..
Red cod	..	22	191	85	919	334	17	4,033	1	2	..	..	6	69	..	..
Sardine	3,811	..	..	..	..	..	..	..	..	..	..	..	..	..	470	..
Skate	..	..	..	2	1	..	..	4	..	..	..	..	..	..	..	..
Snapper	13	..	22	..	..	..	..	2	..	..	..	..	5	1,738	142	..
Sole	..	55	501	86	2,278	..	1	4,993	1,807	1,293	..	..	454	259	..	..
Swordfish	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tarakihi	22	22	6,202	73	6	15	2	3,166	..	..	2	..	7	1	45	..
Trevally	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Trumpeter	..	18	..	171	..	..	..	15	..	..	..	..	..	..	..	..
Turbot	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Warehou	31	1	..	..	..	..	..	128	..	..	..	..	..	..	..	..
Whiptail	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Whiting	..	..	12	..	..	..	..	..	..	..	..	..	..	..	..	..
Mixed flat-fish	1	5	67	..	154	..	..	19	..	..	13	..	3	6	2	..
Mixed round-fish and kinds not specified	231	96	852	72	791	..	5	192	1	44	222	186	179	98	144	..
Totals	7,230	2,105	16,221	1,696	13,022	1,510	1,658	23,264	2,140	1,564	3,352	8,811	814	5,541	2,880	4,420

Table IIb.—Showing the Quantities of Different Kinds of Fish* caught by the Different Methods of Fishing for the Year ended 31st December, 1944

—	Trawl.						Danish Seine.		Other Nets.						Lines.								Grand Total.	
	Steam.		Motor.		Total.		Motor.		Motor.		Row-boat.		Total.		Steam.		Motor.		Row-boat.		Total.			
	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£	Cwt.	£
Barracouta	1,120	681	137	96	1,257	777	2	2	..	..	39	25	39	25	..	..	7,164	3,912	..	..	7,164	3,912	8,462	4,716
Blue cod	10	16	9	25	19	41	5	15	1	2	..	..	1	2	..	..	19,042	41,608	2	14	19,044	41,622	19,069	41,680
"Bonita" (*Brama*)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31	82	..	..	31	82	31	82
Brill	2	4	43	260	45	264	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	45	264
Butterfish (greenbone)	..	..	..	..	..	..	..	..	1,459	3,936	4	9	1,463	3,945	..	..	..	..	..	..	..	..	1,463	3,945
Conger-eel	..	..	..	..	..	..	..	..	2	1	3	2	5	3	..	..	123	87	..	..	123	87	128	90
Elephant-fish	1,022	1,797	3,806	7,925	4,828	9,722	145	218	290	471	2	1	292	472	..	..	48	65	..	..	48	65	5,313	10,477
Flounder	4	10	4,249	17,214	4,253	17,224	3,263	11,206	7,404	20,427	1,081	3,960	8,485	24,387	..	..	..	..	..	..	..	..	16,001	52,817
Frost-fish	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	..	..	4	3	4	3
Garfish	..	..	..	..	..	..	17	63	30	42	..	..	30	42	..	..	..	..	..	..	..	..	47	105
Gurnard	706	900	9,833	13,376	10,539	14,276	5,320	5,317	1,366	947	3	6	1,369	953	..	..	535	573	1	1	536	574	17,764	21,120
Hake	116	267	89	278	205	545	..	..	2	2	..	..	2	2	..	..	824	2,348	..	..	824	2,348	1,031	2,895
Hapuku (groper)	235	819	667	1,973	902	2,792	231	451	11	26	..	..	11	26	71	198	20,625	63,233	61	95	20,757	63,526	21,901	66,795
Herring	..	..	..	..	..	..	..	..	111	195	79	116	190	311	..	..	..	..	..	..	..	..	190	311
John-dory	130	54	72	78	202	132	323	487	..	..	2	1	2	1	..	..	..	..	..	..	..	..	527	620
Kahawai	..	..	..	..	..	..	..	..	1,636	1,211	225	199	1,861	1,410	..	..	304	281	1	2	305	283	2,166	1,693
Kingfish	..	..	..	..	..	..	57	58	173	171	12	12	185	183	..	..	312	400	28	21	340	421	582	662
Ling	458	1,120	1,938	4,387	2,396	5,507	22	38	1	..	..	..	1	..	..	..	5,209	12,020	..	..	5,209	12,020	7,628	17,565
Mackerel	1	..	3	8	4	8	..	..	186	94	..	..	186	94	..	..	..	..	..	..	..	..	190	102
Maomao	..	..	..	..	..	..	..	..	22	36	..	..	22	36	..	..	..	..	..	..	..	..	22	36
Moki	144	281	255	427	399	708	..	..	242	426	15	29	257	455	..	..	24	43	..	..	24	43	680	1,206
Mullet	..	..	..	..	..	..	..	..	3,006	3,481	90	90	3,096	3,571	..	..	..	..	..	..	..	..	3,096	3,571
Parore	..	..	..	..	..	..	..	..	416	269	2	2	418	271	..	..	11	8	..	..	11	8	429	279
Perch	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	662	585	..	..	662	585	662	585
Pioke	..	..	195	232	195	232	355	456	874	920	11	8	885	928	..	..	341	295	..	..	341	295	1,776	1,911
Red cod	957	481	3,734	3,900	4,691	4,381	274	425	30	35	113	73	143	108	..	..	1,223	1,375	..	..	1,223	1,375	6,331	6,289
Sardine	..	..	..	..	..	..	..	..	4,281	3,122	..	..	4,281	3,122	..	..	..	..	..	..	..	..	4,281	3,122
Skate	..	..	16	16	16	16	..	..	..	..	1	..	1	..	..	..	38	28	..	..	38	28	55	44
Snapper	516	663	1,255	2,202	1,771	2,865	81,582	103,052	15,588	20,594	70	107	15,658	20,701	2	3	9,795	16,206	205	294	10,002	16,503	109,013	143,121
Sole	809	2,157	13,474	41,300	14,283	43,457	804	3,341	8	22	..	..	8	22	..	..	..	..	..	..	..	..	15,095	46,820
Swordfish	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	234	292	..	..	234	292	234	292
Tarakihi	9,336	17,182	16,412	27,629	25,748	44,811	18,602	23,097	50	98	..	..	50	98	..	..	565	875	15	21	580	896	44,980	68,902
Trevally	113	79	25	17	138	96	2,786	2,205	5,271	3,879	20	15	5,291	3,894	..	..	117	103	..	..	117	103	8,332	6,298
Trumpeter	..	..	180	342	180	342	..	..	..	..	..	..	..	..	..	..	29	102	..	..	29	102	209	444
Tuna	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Turbot	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Warehou	125	48	..	..	125	48	..	..	685	1,261	274	1,027	959	2,288	..	..	..	..	..	..	..	..	1,084	2,336
Whiptail	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	8	..	..	11	8	11	8
Whiting	32	23	..	..	32	23	..	..	12	43	..	..	12	43	..	..	..	..	..	..	..	..	44	66
Mixed flat-fish	16	43	316	962	332	1,005	27	101	106	202	4	13	110	215	..	..	..	..	..	..	..	..	469	1,321
Mixed rounds and kinds not specified	452	660	2,204	3,609	2,656	4,269	2,407	2,083	1,967	1,598	24	34	1,991	1,632	35	49	1,802	2,327	1	1	1,838	2,377	8,892	10,366
Totals	16,304	27,285	58,912	126,256	75,216	153,541	116,222	152,615	45,230	63,511	2,074	5,729	47,304	69,240	108	250	69,073	146,859	314	449	69,495	147,558	308,237	522,954

* Not including whitebait.

TABLE IIc.—SHOWING TOTAL QUANTITIES OF WET FISH LANDED AT EACH OF THE CHIEF FISHING PORTS EACH MONTH OF THE YEAR, 1944.

Port or District.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
North Island	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Awanui and district ..	187	85	74	146	114	90	72	120	162	147	204	54	1,455
Mangonui	65	53	110	31	52	43	40	26	21	19	23	30	513
Whangaroa	22	52	33	47	53	29	11	69	91	60	78	83	628
Russell	62	122	174	103	83	132	74	166	249	300	570	315	2,350
Whangarei	239	383	443	190	169	333	265	405	410	541	509	217	4,104
Auckland	6,012	6,541	6,830	6,100	8,841	9,185	11,719	13,171	10,303	10,779	11,409	10,188	111,078
Kaiaua	..	24	18	19	16	..	..	..	4	15	25	13	134
Thames	951	1,252	1,928	1,643	1,281	944	1,450	1,928	2,837	2,991	1,607	879	19,691
Coromandel	12	27	22	7	25	1	10	31	18	17	9	5	184
Mercury Bay	26	8	50	107	221	103	53	18	27	57	104	76	850
Whangamata	5	4	..	2	..	1	1	..	3	2	14	10	42
Waihi Beach	82	51	60	50	31	22	7	12	25	37	33	76	486
Tauranga and district ..	853	1,120	979	527	975	527	770	611	1,121	977	1,315	710	10,485
Whakatane	99	39	72	42	176	107	161	169	174	95	165	227	1,526
Ohiwa Harbour, Opotiki, and Cape Runaway	52	43	86	47	75	44	46	54	50	25	35	48	605
Gisborne	250	274	147	341	469	495	687	710	865	1,199	1,425	841	7,703
Napier	1,082	924	469	997	700	1,418	1,572	1,557	2,151	2,324	2,455	2,216	17,865
Castlepoint	13	8	2	6	4	1	1	1	1	5	4	7	53
Wellington	671	891	1,509	887	1,147	1,910	1,928	454	546	637	1,540	1,899	14,019
Makara	19	17	12	13	13	42	189	29	8	3	3	3	351
Paremata	164	270	213	133	135	169	325	130	50	102	150	191	2,032
Paraparaumu Beach ..	58	65	58	45	2	46	71	6	..	22	47	48	468
Manawatu Heads ..	29	10	16	31	35	10	22	25	5	13	10	14	220
Tangimoana	2	1	..	1	1	..	..	..	..	..	1	3	9
Wanganui	12	23	24	32	59	9	17	9	5	7	28	9	234
New Plymouth ..	300	46	79	81	110	9	25	10	1	6	37	275	979
Kawhia	28	30	19	16	10	9	11	14	15	18	14	5	189
Raglan	15	25	16	17	20	14	31	19	15	7	14	25	218
Manukau Harbour ..	98	114	146	129	104	64	80	78	35	86	88	96	1,118
Kaipara	145	213	231	186	256	175	202	424	289	228	182	120	2,651
Hokianga	187	122	114	106	102	67	60	51	79	122	95	96	1,201
South Island													
Havelock	..	3	28	143	215	166	172	116	66	9	3	3	924
Picton	685	726	265	286	466	648	650	177	108	283	1,189	1,747	7,230
Blenheim (Wairau) ..	82	156	47	218	97	81	72	121	135	115	122	47	1,293
Kaikoura	69	173	160	204	233	265	126	134	175	231	205	130	2,105
Lyttelton	306	915	1,236	1,023	1,290	1,824	1,644	1,074	1,428	1,082	3,034	1,365	16,221
Akaroa	163	114	69	203	174	147	104	74	105	171	333	39	1,696
Lake Ellesmere ..	28	25	71	62	79	64	47	51	70	105	151	238	991
Timaru	1,267	1,538	1,156	1,349	1,339	1,153	859	677	740	981	1,017	946	13,022
Oamaru	102	141	163	214	158	41	80	102	240	63	114	92	1,510
Moeraki	126	164	108	194	290	83	86	59	106	163	197	82	1,658
Karitane	58	100	169	134	192	7	..	..	5	57	94	277	1,093
Port Chalmers	844	2,000	1,532	2,451	4,001	1,531	1,977	1,102	1,237	1,876	3,358	1,355	23,264
Taieri Mouth	64	92	101	121	56	20	51	..	26	92	193	172	988
Nuggets	189	159	195	192	116	36	78	67	97	237	590	184	2,140
Tautuku	5	25	21	30	39	5	12	..	..	..	25	5	167
Waikawa	96	156	135	97	86	27	112	104	79	208	299	165	1,564
Invercargill	2	..	..	..	11	..	..	7	4	5	5	..	34
Bluff	314	268	276	256	348	1	396	340	187	305	436	225	3,352
Stewart Island	342	830	1,326	1,489	1,708	63	1,543	746	74	192	362	136	8,811
Riverton district ..	65	79	88	38	55	..	34	42	17	4	126	67	615
Hokitika	23	5	5	4	8	6	4	2	2	1	3	6	69
Greymouth	58	39	126	18	123	30	59	13	..	44	56	51	617
Westport	75	34	74	76	264	51	68	86	19	42	11	14	814
Golden Bay	78	45	126	33	39	25	10	11	14	7	20	11	419
Motueka	72	63	75	67	116	143	162	34	67	75	275	209	1,358
Nelson	167	218	358	301	841	501	540	390	588	475	645	517	5,541
French Pass	217	154	324	272	440	231	299	169	92	73	560	49	2,880
Chatham Islands ..	120	675	669	1,200	785	219	71	..	597	51	33	..	4,420
Totals ..	17,357	21,734	22,837	22,757	28,848	23,367	29,156	25,995	25,838	27,788	35,649	26,911	308,237

Table III.—Return of Land Engineers', Engine-drivers', and Electric-tram Drivers' Examinations held throughout New Zealand during the Year ended 31st March, 1945, showing the Number of Successful and Unsuccessful Candidates

Place.	Extra First Class.		First Class.		Second Class.		Locomotive Traction.		Locomotive.		Traction.		Winding: Steam.		Winding: Electric.		Electric-tram Driver.		Total		Grand Total.
	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	
Auckland	..	..	10	1	25	14	..	..	..	..	1	..	..	..	..	..	39	1	75	16	91
Blenheim	..	..	..	..	11	..	3	..	..	..	2	..	..	..	..	..	..	..	16	..	16
Christchurch	..	..	1	..	13	..	..	1	..	..	2	..	..	..	..	..	12	..	28	1	29
Dunedin	..	..	1	..	16	3	2	..	..	..	..	..	..	..	..	..	4	..	23	3	26
Gisborne	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2
Greymouth	..	..	2	1	8	4	3	..	1	..	..	..	1	..	2	..	..	..	17	5	22
Hamilton	..	..	3	5	18	6	2	..	1	..	..	..	..	..	..	..	..	..	24	11	35
Invercargill	..	..	3	..	8	3	..	..	..	..	1	..	..	..	..	..	2	..	14	3	17
Matawai	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Napier	..	..	..	..	6	6	2	..	..	..	..	..	..	..	..	..	..	..	8	6	14
Nelson	..	..	2	..	5	2	..	..	..	..	..	..	..	..	..	..	..	..	7	2	9
New Plymouth	..	..	2	1	20	1	..	..	..	..	..	..	..	..	..	..	1	..	23	2	25
Palmerston North ..	..	..	..	..	16	2	..	..	..	..	..	..	..	..	..	..	..	..	16	2	18
Rawene	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Ruatoria	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
Timaru	..	..	1	..	3	..	..	..	..	..	5	..	..	..	..	..	..	..	9	..	9
Wanganui	..	..	3	1	3	3	3	..	1	..	..	..	..	..	..	..	4	..	14	4	18
Wellington	..	..	9	5	21	8	2	..	1	..	..	2	..	..	..	..	40	2	73	17	90
Whangarei	..	..	..	1	3	..	..	..	..	1	..	..	..	..	..	..	..	..	3	2	5
Totals	..	..	37	15	180	53	17	1	4	1	11	2	1	..	2	..	102	3	354	75	429

Table IV.—Summary of Examinations for Certificates as Masters and Mates for the Year ended 31st March, 1945

Class of Certificate.	Auckland.				Wellington.				Totals.				Total Examinations.
	P.	P.P.	F.	P.F.	P.	P.P.	F.	P.F.	P.	P.P.	F.	P.F.	
Foreign-going masters and mates	18	27	4	2	20	4	1	3	38	31	5	5	79
Home-trade masters and mates	15	6	1	1	5	1	1	..	20	7	2	1	30
Master, river steamer ..	3	..	1	..	1	..	..	..	4	..	1	..	5
Master, pleasure yacht in New Zealand waters	1	1	..	..	..	..	..	..	1	1	..	..	2
Master of harbour or river sailing-ship	1	..	..	..	..	..	..	..	1	..	..	..	1
Examination in compass deviation	..	..	1	..	..	..	2	..	..	..	3	..	3
Square-rigged endorsement ..	1	..	..	..	1	..	..	..	2	..	..	..	2
New Zealand pilot ..	..	..	..	..	1	..	..	..	1	..	..	..	1
Totals	39	34	7	3	28	5	4	3	67	39	11	6	123

TABLE V.—SUMMARY OF EXAMINATIONS OF MARINE ENGINEERS FOR THE YEAR ENDED 31ST MARCH, 1945

Class of Certificate.	Auckland.				Wellington.				Christchurch.				Dunedin.				Other Places.			Totals.				Grand Total.
	P.	P.P.	F.	P.F.	P.	P.P.	F.	P.F.	P.	P.P.	F.	P.F.	P.	P.P.	F.	P.F.	P.	F.	P.F.	P.	P.P.	F.	P.F.	
IMPERIAL VALIDITY																								
1st and 2nd class (steam)	5	8	..	1	7	18	..	4	4	4	..	1	2	2	1	..	..	..	..	18	32	1	6	57
1st and 2nd class (motor)	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	4
1st and 2nd class steam, endorsement	1	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	2	..	1	..	3
1st and 2nd class motor, endorsement	2	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	..	5	..	..	..	5
Totals ..	11	8	..	1	10	18	..	4	6	4	1	1	2	2	1	..	..	..	..	29	32	2	6	69
VALID IN NEW ZEALAND, ONLY																								
3rd class (steam)	17	..	6	..	26	..	15	..	5	..	1	..	6	..	1	..	..	..	..	54	..	23	..	77
River steam ..	6	..	1	..	3	..	..	..	1	..	..	..	..	..	..	..	1	..	..	11	..	1	..	12
1st and 2nd class coastal (motor)	9	..	..	..	5	..	1	..	1	..	..	..	..	..	..	..	..	..	..	15	..	1	..	16
River (oil) ..	24	..	..	..	5	..	..	..	4	..	1	..	2	..	..	..	26	2	..	61	..	3	..	64
Marine-engine driver	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	..	..	..	2
Totals ..	56	..	7	..	39	..	16	..	11	..	2	..	8	..	1	..	29	2	..	143	..	28	..	171
Grand totals	67	8	7	1	49	18	16	4	17	4	3	1	10	2	2	..	29	2	..	172	32	30	6	240

TABLE VI.—SUMMARY OF CASUALTIES TO SHIPPING REPORTED TO THE MARINE DEPARTMENT DURING THE YEAR ENDED 31ST MARCH, 1945

Nature of Casualty.	On or near Coasts of Dominion.			Outside Dominion.			Total Number of Casualties reported.		
	Number of Vessels.	Tonnage.	Number of Lives lost.	Number of Vessels.	Tonnage.	Number of Lives lost.	Number of Vessels.	Tonnage.	Number of Lives lost.
Strandings—									
Total loss	..	..	..	..	..	..	..	..	..
Damaged	6	1,437	..	..	..	..	6	1,437	..
Undamaged	4	9,197	..	..	..	..	4	9,197	..
	10	10,634	..	..	..	..	10	10,634	..
Fires—									
Total loss	..	..	..	..	..	..	..	..	..
Damaged	4	17,400	..	2	7,393	..	6	24,793	..
Undamaged	..	..	..	..	..	..	..	..	..
	4	17,400	..	2	7,393	..	6	24,793	..
Collisions—									
Total loss	..	..	..	..	..	..	..	..	..
Damaged	2	91	..	..	..	..	2	91	..
Undamaged	4	568	..	..	..	..	4	568	..
	6	659	..	..	..	..	6	659	..
Miscellaneous, including damage by heavy seas, breakdown of machinery, &c.	15	8,417	..	3	8,450	..	18	16,867	..
	35	37,110	..	5	15,843	..	40	52,953	..

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