

1940.
NEW ZEALAND.

MARINE DEPARTMENT.

ANNUAL REPORT FOR THE YEAR 1939-40.

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

Marine Department, Wellington, 28th June, 1940.

YOUR EXCELLENCY,—

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.,
D. G. McMILLAN,
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.

Marine Department, Wellington, 24th June, 1940.

SIR,—

I have the honour to submit the annual report of the Marine Department for the year ended 31st March, 1940.

The planning by the Organization for National Security in anticipation of the outbreak of war made it possible to change over from peace-time to war-time conditions with remarkable celerity and smoothness. The Orders in Council taking the necessary emergency powers in the matter of control of ownership and the requisitioning of shipping were ready in print, and within a few hours of the declaration of war had passed through Cabinet. With the co-operation of Army and Harbour Boards a prepared scheme for coast-watching was put into operation, and an organization set up which still keeps Naval Intelligence in touch with all shipping movements around the coast of New Zealand. All arrangements had been made whereby navigational aids throughout the country could be immediately controlled as and where the necessity arose. It has not been necessary to exercise this control, but the scheme is in being and can be operated at a moment's notice should the occasion arise. Vessels required by Navy for the Examination Services at Auckland, Wellington, and Lyttelton were at once requisitioned, manned, and handed over for duty, the terms of the taking being later arranged by a committee working from Treasury. Three trawlers were taken up in Auckland and handed over to Navy for reconditioning and equipping as mine-sweepers. Two other trawlers were fitted with certain mine-sweeping gear and then returned, for the time being, to their fishing.

At the New Zealand Centennial Exhibition an exhibit as part of the Government Court was prepared in three parts—(a) shipping and navigational aids, (b) machinery, illustrating devices and methods of operation aimed at the prevention of accidents, and (c) fresh and salt-water fisheries.

The programme for electrification of important lights and installation of radio beacons has been continued. The three radio beacons in Cook Strait reported complete in the last annual report have been found entirely satisfactory in operation. The construction work at Cuvier Island and Moko Hinau Island at the entrance to Hauraki Gulf is now complete. The lights have been changed over to electricity, and we are awaiting the services of a Radio Engineer to connect up the beacons. At Cape Reinga in the extreme north, and Puysegur Point in the extreme south, hard-surface access roads are in process of construction.

The Admiralty surveying ship "Endeavour" continued her work on the eastern coast of Auckland Province until June, 1939, returning to England three months later. The contemplated replacement is now deferred owing to war conditions. In all, 662 miles of coastline were surveyed and 4,289 square miles of sea-bed sounded.

Despite several calls for duty outside her normal sphere, the G.S.S. "Matai" regularly serviced and maintained the lighthouse installations, automatic lights, buoys, &c., on the New Zealand coast. In the absence of a cable-laying ship she was called upon to repair and partially relay a cable in the

difficult waters of Cook Strait and to recover for future use a large quantity of abandoned cable; also she very expeditiously picked up and repaired two cables off the Auckland Coast. On another occasion she was called upon to aid a vessel in distress in the Pacific.

The policy of the Department in progressively improving the lot of lightkeepers is proceeding. Mail and victualling services have been improved, and several dwellings have been renovated and new furniture provided.

HARBOURS.

The Marine Department has maintained direct administration of Kaipara, Picton, Little Wanganui, and Westport Harbours during the past year. Except for these harbours and a few vested in already existing local authorities, properly constituted Harbour Boards administer the harbours of New Zealand.

Kaipara Harbour.—Work here during the year has consisted of the usual maintenance of buoys and beacons in the extensive Kaipara Harbour, and a new launch for the Harbourmaster has enabled him to carry out a more direct supervision of the whole harbour.

Picton Harbour.—The Department purchased a new launch for the use of the Harbourmaster during the year. This is giving satisfaction. Apart from general maintenance of the harbour, piloting, &c., the Harbourmaster now carries out a fortnightly mail and servicing trip to the Brothers Lighthouse.

Little Wanganui.—Repairs and general maintenance have been carried out in connection with the wharf, and the work of reconditioning the goods-shed is proceeding.

Westport Harbour.—The trade at the port fell slightly compared with that of the two preceding years, the shipments of coal, on which the revenues of the port per medium of royalties and shipping dues are so largely dependent, being decreased by some 18,000 tons on the year's working as against the previous year. At the same time, however, the total for the year, in exceeding 400,000 tons, maintained a satisfactory standard.

The total quantity of coal shipped during the year was 408,380 tons, as against 426,393 tons the previous year. The demand for coal was higher than the supply from the local mines could meet, and until late in the year there was every prospect of the previous year's good total being exceeded, but industrial trouble at the Denniston Mine, the main mine in the district, in November, when there was no output from the mine for three weeks, resulted in a serious drop in output and subsequent delay in pick-up.

During the year 295 steamers and 47 auxiliary sailing-vessels, aggregating 271,774 tons net register, worked the port, as against 359 steamers and 41 auxiliary sailing-vessels, aggregating 290,593 tons net register, for the year 1938-39, a net decrease of 58 vessels and 18,819 tons net register.

As against the decreases detailed in the foregoing it is of interest to note, particularly in view of the adverse operating conditions which obtained during the year, that the average size of vessel which worked the port was approximately 10 per cent. greater than for the previous year, whilst there was a 15-per-cent. increase approximately in the quantity of coal transported per steamship from the port.

During 1938-39 there was an appreciable overseas export trade of coal, to Noumea and Pago Pago, of 11,105 tons, but during the year now being reviewed there was no coal exported overseas, whilst there was also a slight falling off in bunker trade, which trade is encouraged by reduced port dues on vessels calling for bunkering purposes only. Actually, the number of overseas vessels of this classification which called—viz., 23—was similar to the previous year, the total of 36 shown in the tabulation for 1938-39 including several overseas coal-cargo vessels, fishing-trawlers, and a small dredge, which vessels do not ordinarily fall within the category of overseas bunker trade.

Twenty-three vessels called for bunker coal only, and lifted, in all, 20,455 tons.

The mean of high-water depths on the bar for the year was 22 ft., which was a fair improvement on the 1938-39 mean of 21 ft. 3 in. This improvement is further illustrated by the following comparisons in number of days on which the respective depths of water obtained on the bar at high water :—

Depth.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1934-35.	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.
Over 14 ft.	..	..	..	..	365	365	366	365	365	365	366
„ 16 ft.	365	365	..	365	360	357	361	365	365	365	366
„ 18 ft.	363	340	366	350	279	353	355	356	361	363	366
„ 20 ft.	345	208	360	287	152	263	263	328	338	275	330
„ 22 ft.	276	43	252	144	42	81	90	257	222	126	184
„ 24 ft.	99	..	53	14	..	15	6	86	31	11	36
„ 26 ft.	11	..	10	..	..	..	..	7	..	..	..
„ 28 ft.	..	..	..	..	..	..	..	..	..	..	..

The advantages to shipping which otherwise would have been gained by the improved depths of water on the bar were, however, somewhat nullified by the consistently unfavourable weather and surface conditions which were experienced during the year.

The weather during the first month of the year was good, but then conditions by no means favourable to shipping set in, and there was no appreciable let-up until October and November. There was retrogression again in December to unfavourable conditions, culminating in January and February of this year in a period of adverse conditions of unusual intensity, particularly for mid-summer months. Rain fell on no less than 44 days during the two months, with just on 24 in. of rainfall recorded at the signal-station, and the Buller River was under flood for a large part of the time.

During four months of the year only could conditions be characterized as favourable, and on 3 days only was there smooth water on the bar, compared with 26 days during the preceding year; whilst on no less than 222 days (*i.e.*, 61 per cent. of the year) there were seas on the bar in excess of "light" (that is, 4 ft. or more in range), as compared with 180 days for similar state of seas during the previous year.

On 31 days the bar was quite unworkable, as against 23 days for the similar state of affairs during the preceding year.

In view of the foregoing circumstances it is not to be wondered at that during the twelve months 45 vessels left the port under restricted draughts, due very largely to the consistent swells on the bar reducing the otherwise favourable depths of water. As instancing the effect of the particularly unfavourable conditions during the last few months of the year, in November 4 vessels cleared the port drawing more than 18 ft. 6 in., including one drawing more than 19 ft., whereas during the remaining four months of the year not one vessel was able to leave the port drawing even 18 ft. 6 in., despite the fact that there was 20 ft. or more of water on the bar at high water on no less than 109 days during the four months.

On the other hand, every effort was made by the Harbourmaster and his staff to work the port to the maximum possible under the difficult circumstances which obtained, and the results must be considered highly satisfactory. Thirty vessels drawing from 18 ft. to 18 ft. 6 in., 19 drawing between 18 ft. 6 in. and 19 ft., and 5 with draughts exceeding 19 ft., left the port, and an overseas vessel, the *s.s.* "City of Glasgow," in July, left drawing 19 ft. 4 in., the greatest draught for a vessel of such size to leave the port since November, 1929, and for any vessel for eight years.

The same vessel, which entered the port for bunkers, was partly loaded with overseas general cargo, and the draught of 17 ft. 7 in. is the greatest at which such a large vessel has been brought into the port, and the forward draught of 14 ft. 6 in. is the greatest at which such a vessel has ever been swung in turning in the river.

Again, as instancing the endeavours to work the port to its fullest ability, during February, when, on the whole, the conditions during the month were the worst of the year, two overseas vessels, which, with lengths of 430 ft. and 432 ft. respectively, were the longest ever to work the port, were successfully handled and expeditiously despatched. A few weeks later another overseas vessel of 431 ft. in length also worked the port. These vessels respectively—the *s.s.* "Silksworth," *s.s.* "Ilanashe," and *s.s.* "Michael Livanos"—entered the port for bunkers, and not since 1914 had any attempt been made to handle through the port vessels approaching the lengths mentioned.

Conditions were not favourable to dredging, but every reasonably possible effort was made in this direction to assist and to combat the forces of nature in the maintenance of the port in the best condition possible under the circumstances.

Early in the year the large suction dredger "Eileen Ward" was recommissioned after having new boilers installed. The smaller suction dredger "Rubi Seddon" was then placed out of commission and subjected to intensive internal maintenance-work so as to ensure retaining the vessel in good order against further requirement.

With strong seas so prevalent throughout the year the opportunities to carry out dredging operations were limited, but the "Eileen Ward" was worked on the bar on all possible occasions and otherwise was usefully employed in removing shoals from the loading-berths where such occurred following the many freshes which were experienced in the river.

The bucket dredger "Maui," which was recommissioned towards the close of last year to carry out maintenance dredging in the river and on various areas on which the suction dredge cannot operate, worked also to the limit permitted by the adverse circumstances, and has shown satisfactory results.

As available from the harbour quarry at Cape Foulwind, further heavy stone has been tipped at the head of the western breakwater to safeguard the apron of the wall where work ceased rather abruptly in 1931. At the same time a considerable quantity of second-class stone has been placed in repairing weaknesses in the bank facing at Organ's Island which developed from flood attacks a few years ago. This work has been completed, and now the low training-wall at the lower end of the Island is being lengthened down-stream to confine and direct the channel of the river where otherwise it is meandering and causing erosion of the banks and deposition in an undesirable manner.

The standing rigging of the signal-station at the head of the western breakwater has been completely renewed and the whole painted, as also the port leading beacons, which structures are in good order. Due attention has been given where necessary to all other harbour structures and navigating services.

HARBOUR-WORKS.

Te Kopuru Wharf.—It has been found impossible, owing to difficulties in obtaining hardwood-timber supplies, to make a start during the year with the replacement of this structure, but as the timber has now come to hand an early commencement of the work is anticipated.

Hicks Bay Wharf.—An examination of the timber portion of this wharf revealed that 67 ft. of the timber jetty was in a bad state of disrepair, with a number of the piles eaten through. Proposals for the necessary remedial measures have been approved, and tenders for the work will be called as soon as material which has been ordered from overseas comes to hand.

Tolaga Bay Wharf.—Serious deterioration has occurred in much of the reinforced-concrete structure of this wharf, and the best method of remedying the position is under consideration.

Waikokopu Harbour.—The control of this harbour is under the jurisdiction of the Wairoa Harbour Board on behalf of the Public Works Department. During the year 69 vessels worked the port, and 5,884 tons of imports were handled. Exports included nearly 140,000 carcasses of beef, lamb, mutton, pork, &c., 949 bales of wool, and a considerable quantity of sundry goods.

Repairs to the wharf on account of the attack of teredo below the protective sheathing on the piles were carried out, together with other minor items of maintenance.

Kawhia Harbour Lights.—Plans and proposed positions for new beacons have now been finalized, and the question of supply and installation is under consideration.

Mokau Wharf.—An inspection of the present wharf has been made, and soundings, borings, &c., taken in its vicinity. Possible alternative localities for a new wharf are under consideration.

Wharves in Sounds County.—A contract has been let for the construction of a launch jetty 80 ft. long at Ship Cove, and tenders were invited for the construction of a similar type of jetty 70 ft. long at Tennyson Inlet in Pelorus Sound.

Plans have been approved for the reconstruction of the jetty at Endeavour Inlet, and arrangements are being made to have the work commenced at an early date.

Surveys are in hand for proposed jetties at Elaine Bay, in Pelorus Sound, and at Momorangi Bay in the Grove arm of Queen Charlotte Sound. This latter jetty would serve the Ngakuta Domain.

Bruce Bay.—A survey for a proposed wharf has been completed and reported upon, and is under consideration.

Okuru.—The erection of a new wharf shed has been completed.

LIGHTHOUSES.

Cape Reinga.—From Te Pahi the access road to the new site for the Cape Reinga Lighthouse and buildings was formed over its whole length of ten miles, and three miles were metalled.

The construction of the lighthouse-keepers' cottages, direction-finding beacon, and radio telephone is in hand.

Electrical equipment for this station is at present held in Auckland ready to be forwarded when required.

Tutukaka Heads (Automatic Light).—Lighting equipment has been ordered, and the question of a suitable structure for housing the light is being investigated by the Engineer to the Whangarei Harbour Board.

Cuvier Island.—Regular maintenance-work was carried out in connection with the electrical plant and lighthouse equipment installed last year, and the exterior of the dwellings was repainted.

Moko Hinau.—During the period the installation of equipment necessary for the electrification of the station was completed, and maintenance-work has been carried out since the plant was placed in operation.

East Cape.—Proposals are under consideration in connection with access to the East Cape Lighthouse.

Stephens Island.—The lighthouse-tower, office, school, store-room, engine-room at first landing, and the shed at the top landing have been painted. Roofing and spouting have been attended to on the wireless-house, signal-house, and on the three cottages occupied by the keepers. Regular maintenance has been carried out on the electrical plant. During the early part of the year the radio-beacon equipment was installed.

Brothers.—The whole of the tram-line has been overhauled, the track has been regraded, new sleepers have been installed, and numerous rails and fishplates replaced. The line is now in good working-order. The winch-house has been extended and a new Diesel-driven winch installed in place of the existing hand-winch. A radio-telephone mast has been erected, and radio-telephone equipment installed.

Castlepoint.—A new landing-shed has been erected.

Baring Head.—Two cottages were painted and renovated, and the lighthouse has been painted. One hundred and twenty chains of fencing were erected, together with the necessary gates. Flood damage to the access road was repaired. Regular maintenance has been carried out to the electrical plant.

Akaroa Head.—Cottages have been reroofed in iron during the year. An inspection of the present crane-structure used for unloading stores from vessels was made and its replacement recommended. Proposals have now been approved for the erection of a Blondin cableway over the inlet, which will enable unloading operations to be carried out direct from the vessel at any point beneath the line of the cableway.

Centre Island.—In February, 1939, a contract was let for the erection of three lighthouse-keepers' cottages at the Centre Island Station, the material having been purchased earlier and conveyed to the site by the Public Works Department's forces. The cottages were completed at the end of October, 1939, and the lighthouse-keepers are now housed in comfortable modern quarters.

Puysegur Point.—A commencement was made on the construction of one mile and three-quarters of access road from the landing to the lighthouse, and formation and gravelling were nearing completion at the end of the year. Proposals for the improvement of the landing and the construction of a new shed at this point were approved, and a site selected for the erection of the radio beacon power-house.

Nugget Point and Cape Saunders.—Tenders have been accepted for substituting the present iron roofs with Fibrolite at both these lighthouses. However, owing to shortage of supplies and the import restrictions on Australian products, the contractors have been unable to commence the work. Supplies of Fibrolite have now come to hand, and the jobs will be commenced within a week or two. The contract prices are as follows: Nugget Point Lighthouse, £235; Cape Saunders Lighthouse, £260.

Taiaroa Head.—Fog-signal: An aerial extension light was fitted to the pole outside the petrol-store to provide light for the store, and also for the pathway to the engine-sheds. A final check was made on the repairs to engines, which were carried out last year. A new diaphragm was fitted to the fog-signal.

Kahurangi Point.—Adjustments were carried out to the Dalen flashers to rectify faulty light characteristic.

Cape Egmont.—Adjustments were made to the Dalen flashers to rectify faulty operation, and a new sun valve was fitted.

Godley Head.—Owing to Defence requirements it is necessary to move this light and the keeper's cottage. Proposals are under consideration and work will be put in hand as soon as possible.

Cape Campbell.—Regular maintenance has been carried out to electrical equipment at this station.

Jackson's Bay.—A site has been levelled for an automatic light at this spot, and the necessary materials for its erection are coming to hand. Eleven chains of access track have been formed.

THE HARBOUR BOARD LEGISLATION.

The Acts enumerated below affecting harbour legislation were passed during the year, and the various Bills were investigated by the Marine Department before presentation to Parliament :—

The Bluff Harbour Board and Bluff Borough Council Empowering Amendment Act, 1939, authorized the Board to increase its authority to borrow from £12,000 to £17,000.

The Napier Harbour Board Loan Amendment Act, 1939, authorized the Board to borrow a further sum of £125,000 to complete its scheme of harbour-works.

The Nelson Harbour Board Empowering Act, 1939, authorized the Board to borrow the sum of £30,000 for the purpose of carrying out certain harbour works.

The New Plymouth Borough Land Exchange and Empowering Act, 1939, affected the exchange of certain lands between the Corporation of the Borough of New Plymouth and the New Plymouth Harbour Board for the purpose of promoting carnivals for the object of raising funds for the maintenance and improvement of public reserves and domains.

The Otago Harbour Board Empowering Act, 1939 :—

- (1) Authorized the sale of certain land to His Majesty the King:
- (2) Sale of land to Dunedin Drainage Board:
- (3) Amended the provisions of the Otago Harbour Board Empowering Act, 1936, regarding the application of the unexpended portion of the loan:
- (4) Authorized the exchange of land with Port Chalmers Borough Council:
- (5) Authorized the lease of land to Otago Education Board:
- (6) Granted the Board authority to make by-laws prohibiting trespass on the Board's lands.

In addition to the above legislation, sections dealing with the Harbour Board Legislation in other Acts are mentioned below :—

(a) *The Local Legislation Act, 1939*.—Section 7: Authorizing the Great Barrier Island County Council to expend certain moneys in wharf construction.

Section 30: Empowering the Patea Harbour Board to grant a lease of certain lands to the West Coast Refrigerating Co. Ltd.,

Section 31: Validating the payment of a compassionate allowance to the widow of the late A. E. Parkinson, by the Whakatane Harbour Board.

Section 32: Validating expenditure incurred by compassionate allowance to W. T. Gwyer, Eva Holland, and Allison Stanners by Auckland Harbour Board.

Section 33: Extending period during which the interest on Thames Harbour loans is reduced.

Section 34: Authorizing Napier Harbour Board to expend moneys to be received and held in trust for endowment purposes.

Section 35: Authorizing the Wairoa Harbour Board to raise special loan for aerodrome purposes.

Section 53: Authorizing the Wellington Harbour Board and Wellington Corporation to exchange land at Evans Bay for a portion of Fryatt Quay.

(b) *The Reserves and Other Lands Disposal Act, 1939*, substituted an altered description of the part of Waterloo Quay vested in the Corporation of the City of Wellington by the Reserves and other Lands Disposal Act, 1938.

Section 12: Cancelled Order in Council relating to the Pilot Reserve, and validating and amending Orders in Council relating to the Lighthouse and Signal Station Reserve in the Town of Napier.

Section 15: Validated an agreement between His Majesty the King and the Auckland Harbour Board regarding the establishment of an air-service base at Mechanics Bay in Auckland Harbour.

ADJUSTMENT AND INSPECTION OF COMPASSES.

The regulations for the adjustment of compasses have been carefully administered, and compasses continue to be maintained in a good state of efficiency. The results of the investigation of adjustments show that the work of the Inspectors and Adjusters has been carefully performed. Extra supervision has been necessary in a few cases on account of the changes in the magnetic forces in the vessels.

ADMIRALTY CHARTS.

The Department acts as agent for the sale of Admiralty charts and maintains a stock at Head Office and at the Mercantile Marine offices at Auckland, Wellington, Lyttelton, and Dunedin. The stock includes all charts of the Dominion and also a considerable portion of the world which practically includes passages to all places where non-regular traders are likely to go after discharging in the Dominion. A supply of about 360 different charts is maintained to meet normal demands.

The charts, after their receipt, are periodically corrected to date, and to ensure that purchasers receive any further information received between the dates of correction a list of Notices to Mariners affecting the charts is maintained at each office for inspection. The sales last year amounted to 1,471 copies an increase of 20·4 per cent. for the year.

EXAMINATION OF MASTERS AND MATES.

During the year examinations were held in Auckland and Wellington and were conducted in a satisfactory manner, those for foreign-going certificates being in accordance with the Imperial Board of Trade requirements.

One hundred and seventy-one examinations were held, the percentage for foreign-going and home-trade certificates being as follows—Foreign-going: Full pass 48·4 per cent.; partial pass, 33·3 per cent.; failure, 18·3 per cent. Home-trade: Full pass, 62·5 per cent.; partial pass, 16·7 per cent.; failure, 20·8 per cent. Two candidates passed for fore-and-aft sailing-ship endorsement, one for square-rigged endorsement, and one for compass syllabus.

Since the regulations governing the examination for certificates as yacht masters in New Zealand waters were altered last year, fifty-six candidates presented themselves for examination. They showed a good knowledge of navigation and a commendable standard of seamanship, and only eight failed.

EXAMINATION IN FORM AND COLOUR VISION.

These examinations are held at Auckland, Wellington, Lyttelton, and Dunedin. During the year seventy-one candidates were examined, of whom six failed.

CASUALTIES.

The number of casualties on or near our coast is shown in the table at the end of the report and, as will be seen from their description, varied considerably in their nature and were fortunately, unaccompanied by loss of life.

The major casualties of the year were the total loss of the s.s. "Port Bowen" outside of Wanganui and the s.s. "Waikouaiti" on Dog Island. Formal investigation was held into these two losses and also into the stranding of the m.v. "Clansman" off Cape Colville, and the collision at Napier between the motor-vessels "Miro" and "Koutunui."

"NEW ZEALAND NAUTICAL ALMANAC AND TIDE-TABLES."

This publication for 1940 (thirty-eighth edition) was issued for sale on the due date, 1st November. The publication provides mariners and others with much necessary and useful information in addition to sailing directions and information concerning various ports of the Dominion. The port information is corrected by the various Harbour Boards, and at the time of going to press about the middle of October—is the latest available. Subsequent alterations are made by Notice to Mariners.

NOTICE TO MARINERS.

Information relative to changes in navigational aids and to the discovery of rocks, shoals, or other dangers to navigation and other general information necessary for the use of mariners is published weekly in the form of Notices to Mariners, sixty-six of which were issued during the year.

When the information is of an urgent character it is sent out in the form of a wireless warning by the Post and Telegraph shore stations to ships carrying an operator, and to other ships by the National and Commercial Broadcasting Stations. The latter stations now play an important part in the safety of life at sea and always render willing assistance when required.

ENGAGEMENT OF SEAMEN.

The various shipping offices through New Zealand have maintained the service of providing seamen for engagement, both for foreign-going and home-trade vessels.

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 its amendments, during the year was £16,567 Os. 9d., as against £20,526 2s. 3d. for the previous year, a decrease of £3,959 1s. 6d.

REGISTRATION OF SHIPPING.

On the 31st December, 1939, there were on the register of vessels in the Dominion 48 sailing-vessels of 4,288 net tons register, 155 steamers of 76,905 net tons register, and 301 motor-vessels of 19,926 net tons register, as compared with 47 sailing-vessels of 4,285 net tons register, 156 steamers of 71,060 net tons register, and 289 motor-vessels of 18,222 net tons register at the end of the previous year.

The number of seamen employed on board was 2,954, compared with 2,965 for the year 1938.

SURVEY OF SHIPS, 1939-40.

The following table shows the number of certificates of survey issued to ships during the year, the figures for the previous year being shown in parentheses:—

Sea-going steam and motor ships	158	(160)
Restricted-limits steam and motor ships	345	(361)
	<hr/> 503	<hr/> (521)

The new sea-going motor-ships, "Karitane," of 2,534 tons gross, and "Kopara," of 679 tons gross, and one new sea-going steamer "Kurou," of 3,900 tons gross, were surveyed for the first time during the year for the issue of certificates. These ships carry cargo only.

Nine restricted-limits motor-launches, of which six are new vessels, were surveyed for the first time during the year for the issue of certificates. Two of these are pilot launches in harbour service, while the remainder are engaged in passenger service and, in one case, deep-sea sports fishing also.

Plans and specifications of four new wooden vessels building for service in New Zealand waters were examined and approved by the Department during the year.

One of these is a tug, 50 ft. overall length, for towing lighters, and propelled by a Gardner Diesel engine of 136 b.h.p. Of the other three vessels, two are Danish-seine fishing-boats and one is a fishing-launch, all being fitted with internal-combustion engines.

In addition to the annual surveys, 268 seaworthiness, efficiency, and tonnage surveys were made during the year, inclusive of 46 seaworthiness and efficiency surveys made to overseas vessels not registered or normally surveyed in the Dominion. Of the latter surveys, two were connected with damage to hulls, five with machinery, shafting, and propellers, one with main boilers, and five with windlasses and winches. Twenty-one surveys were made for the renewal of International Safety Radiotelegraphy Certificates, and two for the extension of Board of Trade Passenger and Safety Certificates.

The wreck of one vessel on the Department's register occurred during the year. The s.s. "Waikouaiti," of 3,926 gross tonnage, engaged in foreign-going cargo trade, ran ashore on Dog Island, Bluff, in November, 1939, and became a total loss.

During the annual survey of one steamship serious defects of outstanding interest were found in both main boilers. Each boiler was 14 ft. 9 in. diameter and 10 ft. 6 in. long. The cylindrical shell plates were $1\frac{1}{4}$ in. thick and were butt-jointed with riveted double butt straps at the port and starboard sides of the steam-space. The boilers were made in 1925 and work at a steam-pressure of 190 lb. per square inch.

Indications of leakage at the longitudinal seams of the port boiler were observed, and a closer inspection revealed several broken rivets in each seam. All the rivets in the seams were then removed. The butt straps were taken off and examined, when cracks on the faying surface of the outer straps at rivet-holes were found. For the purpose of establishing the cause of the cracks, portions of the cracked plates were forwarded to the School of Engineering, Canterbury College, for microscopical examination. In the meantime a thorough search of shell plates for cracks at the joints was made with a magnifying glass, but without results. In view of the nature of the failure of the rivets and butt straps the probability of the existence of very fine cracks in the shell plates could not be overlooked. It was decided, therefore, to endeavour to discover cracks by the aid of the magnetic dry-powder method of crack-detection. It is based on the well-known principle that mobile iron filings in a magnetic field show the direction of the lines of force and migrate into positions of high magnetic resistance. The boiler was then magnetized and dusted with the iron-powder at the rivet-holes. Numerous cracks previously invisible by ordinary means of inspection were then detected. A magnetic test of the starboard boiler also indicated extensive cracking. It has been established that the cracks were caused by what is commonly known as chemical embrittlement of the steel, which is an action said to be due to chemical attack of the boiler water combined with abnormal stress in the material. On account of the creeping character of this form of cracking it is very dangerous, and both boiler shell plates were condemned as unfit for any useful steam-pressure. The boilers have been removed from the ship, and other boilers have been installed.

This is the first occasion on which boilers in New Zealand have been subjected to a magnetic test for detection of cracks, and the experience gained and the result obtained were most interesting and striking.

INSPECTION OF MACHINERY.

Boilers.

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

Fired boilers	..	..	..	..	4,778	(4,855)
Unfired steam-pressure vessels	..	..	..	..	4,245	(3,889)
Air-receivers	..	..	..	..	1,078	(941)
					10,101	(9,685)

The inspections include 91 new power boilers, aggregating 1,094 horse-power, manufactured within the Dominion, and 43 new power boilers, aggregating 1,027 horse-power, imported from abroad. They also include 181 new steam-pressure vessels and 58 new air-receivers manufactured within the Dominion and 237 new steam-pressure vessels and 44 new air-receivers imported from abroad. The total number of new boilers, pressure vessels, and air-receivers put into service during the year was 654, against 666 for the previous year.

The only explosion reported during the year was that of a pressure vessel neither inspected nor certificated by the Department. It was in use with an air-pressure of 60 lb. per square inch when the bottom end blew out and the remaining portion struck a workman and inflicted serious head injuries. The ends were soldered only, and were therefore quite unsafe for the pressure.

Machinery.

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

Machines not driven by steam-power; plants (10,721)	..	77,450	(72,123)
Machines driven by steam-power; plants (2,385)	..	10,987	(11,391)
Electric-power-supply stations	..	150	(134)
Lifts	..	3,398	(3,318)
Cranes	..	513	(460)
Hoists	..	1,599	(1,516)
Tractors	..	360	(367)
Total inspections	..	94,457	(89,309)

The number of inspections shows an increase of 5,148 over the previous year and is the highest number yet recorded in any one year. Included in the inspections are thirty-seven lifts and forty-eight cranes inspected for the first time. The new crane inspections include special-purpose cranes for such duties as pole-stacking, bulk transport of artificial manures, and gold-dredging. Designs have been approved for two cranes to be built in the United Kingdom, one of 90 tons capacity and one of 80 tons. A satisfactory development is noted in the design and construction of certain types of power-cranes by New Zealand engineering firms.

The number of accidents reported during the year in connection with boilers, cranes, lifts, hoists, and general machinery inspected by the Department was 133, of which 4 were fatal and 129 were non-fatal. The corresponding figures for last year are 5 fatal and 157 non-fatal accidents. In accordance with the established practice of the Department every legally notifiable accident was thoroughly investigated during the year as soon as practicable after its occurrence, and steps were taken, where possible, to eliminate the accident-producing hazards.

The fatal accidents occurred at a travelling crane, transmission shafting, a circular saw, and a rolling lift bridge. The following are brief accounts of each accident compiled from the reports. The steps taken to ensure as far as is practicable that the worker is protected from a similar occurrence are mentioned in each case :—

(1) A works engineer opened and passed through a door leading to a crane runway just as the crane was passing the doorway. He was crushed between the crane and a post supporting the roof and received injuries, from which he died. He was quite familiar with the works, but it is thought that he must have mistaken the entrance to the crane for a door giving entrance to the fitting-shop, which it was known he intended visiting. The door has been fitted with a lock, the key of which is in the custody of the crane-driver. This should prevent another accident under similar circumstances.

(2) Whilst he was engaged in brushing down the roof beams of a factory, the apron of an employee was caught on a revolving shaft. His clothing was torn from his body and he was so severely injured that he died in hospital within a few hours of the accident.

The shafting is 11 ft. from the floor and is out of normal reach, and should have been approached only when the machinery was stopped. In view of the apparent lack of supervision given in the factory to prevent access to the shafting when in use, the shafting has been completely fenced and guarded.

(3) A workman at a sawmill was killed when using a circular saw. After ripping a piece of timber 15 ft. long he discarded the left portion and lifted the other portion over the top of the saw. The teeth of the saw caught the passing timber and shot it forward with such force as to cause fatal injuries to the workman. The saw had not been seen by an Inspector of Machinery and was not adequately guarded. A hood guard covering top of the saw has now been fitted.

(4) Whilst repairs were being carried out to a rolling lift bridge a mechanic was pinned beneath it when, through some misunderstanding, it was lowered. The lifting and lowering mechanism was in good condition. Instructions have been issued which should safeguard a repetition of the accident.

As in previous years, the injuries received in the majority of the 129 non-fatal accidents inquired into were to the fingers and hands. Some of these accidents were trivial, but all were fully investigated, as very often the search into the cause of a minor accident will indicate how a guard can be improved to safeguard an accident of a more serious nature. There were, unfortunately, a number of serious accidents resulting in the loss of limbs. In five cases an arm was severed, torn off, or so badly injured that it had to be amputated. There were 3 accidents in which hands were severed, and in 1 case a foot was cut off by a circular saw.

Twenty-nine of the non-fatal accidents were due to the very unsafe practice of cleaning or adjusting machinery whilst it was running. The danger of this practice cannot be too highly stressed, and the most harmless looking shaft, spindle, roller, or wheel is a potential hazard when approached with a cleaning rag or an adjusting tool. In all these cases the stopping of the machine would have removed all accident risk. Another dangerous practice responsible for a number of accidents is that of putting on or adjusting belts of running machinery. In one case a workman in a sawmill got inside the guard rail protecting a line shaft and attempted to wrap a canvas belt around the running shaft. The belt trapped his hand and drew him to the shaft, and his right arm was torn off above the elbow. In another case a girl attempted to replace a small belt driving a sewing-machine. First her cardigan and then her skirt were caught, and she was drawn to the shaft. Fortunately the weight of the girl stopped the low-powered driving motor, and she escaped with bruises and shock. In her statement on the accident she said that she will never attempt to put on another belt on any machine unless the power is off. If all machinery attendants were of a similar mind there would be comparatively few accidents with belts and transmission shafting.

The Department's machinery notices issued to all places where machinery is inspected call attention to these very unsafe practices.

In one accident eight workmen were overcome by fumes when a valve on an ammonia compressor burst. The failure of the valve was attributed to a carry-over of liquid ammonia from the suction side, and an additional liquid separator has now been fitted on the low pressure ammonia line to prevent a recurrence. Fortunately, the workmen injured by the fumes made a quick recovery.

Accidents with woodworking machinery were again comparatively numerous and accounted for over one-third of the total accidents reported. Of the 51 wood-working machinery accidents, 23 were with circular saws, 4 with other types of saws, 10 with planers, and 6 with shapers and moulders. The total number of accidents with circular saws was 25 and was by far the greatest number with any one class of machine used in the industry. The dangerous nature of the circular saw has been stressed for many years, and particular attention is given by the Inspecting Staff to the guarding of this machine.

A safety poster printed in two colours drawing attention to the hazards of the power-driven saw was widely circulated among machinery owners last year. Other machines at which numerous accidents occurred included power presses (9), transmission machinery (11), and butchers' mincers (3). Thirty per cent. of the victims of machinery accidents were young and generally inexperienced persons of eighteen years of age or less.

It is intended to issue each year new safety posters for distribution to machinery-owners. Two new posters will be circulated this year, and also one which has been revised. Safety posters are recognized as valuable aids towards the elimination of that class of accident which is caused by failure of the personal factor such as carelessness. Unfortunately, this is the primary cause of most of the accidents herein reported.

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

Machines.	Sawmilling and Woodworking.	Textile.	Refrigerating.	Printing.	Metal-working and Engineering.	Laundry.	Butchery.	Confectionery, Bakery, &c.	Boxmaking.	Other Industries.	Total (Machines).
Circular saws	24	..	..	..	..	..	..	1	1	..	26
Other saws	4	..	..	..	..	..	..	..	..	..	4
Planers (wood)	10	..	..	..	..	..	..	..	..	..	10
Shapers and moulders ..	6	..	..	..	..	..	..	..	..	..	6
Power presses .. ..	..	..	..	..	6	..	..	..	2	1	9
Guillotines .. ..	..	..	..	1	..	..	..	1	..	..	2
Laundry mangles .. ..	..	..	..	..	..	1	..	..	..	..	1
Butchers' mincers .. ..	..	..	..	..	..	..	3	..	..	..	3
Lifts .. ..	..	..	..	..	..	..	..	..	..	3	3
Cranes and hoists .. ..	..	..	..	..	..	..	..	..	..	1	1
Belting	3	1	1	..	..	..	..	1	1	3	10
Shafting	1	..	..	..	..	..	..	..	..	1	2
Gearing .. ..	..	..	..	..	..	..	..	..	..	2	2
Boilers and pressure vessels ..	..	..	1	..	..	..	..	..	..	3	4
Others	3	10	3	1	7	1	..	8	2	15	50
Total (industries) ..	51	11	5	2	13	2	3	11	6	29	133

NEW ZEALAND STANDARDS.

The Department was represented during the year on the Mechanical Engineering Divisional Committee, the Executive Committee, and the Fire-extinguishers Sub-Committee of the New Zealand Standards Institute. Numbers of specifications were examined and written comments furnished. In association with the Institute and with the approval of Cabinet, a Bill dealing with the certification of welders is being prepared for presentation to Parliament this session.

NEW ZEALAND CENTENNIAL EXHIBITION, 1939-40.

Full effect has been given to the Ministerial direction that the pavilion of the Marine Department in the Government Court of the Centennial Exhibition should be worthy both of this great enterprise and of the historic occasion which it celebrated. In planning the form which the exhibit of the Survey of Ships and Inspection of Machinery Branches should take it was decided that safety of life at sea and safety in industry should be the collateral dominating themes. At the same time care was taken to provide something of popular interest to attract the large body of visitors who would not be concerned with the specialized technical aspects of shipping and industry.

In the Inspection of Machinery Section a floor space of 70 ft. by 19 ft. was fully occupied by full-size power-driven machines selected to lay strong emphasis on the necessity for effectual safety devices and guards to prevent accidents. Many of the machines were arranged as working exhibits, and the public were afforded the opportunity to operate them to test the efficiency of some of the safety devices with which the modern machine is fitted. Valuable aid to the Department's work was afforded by the specially-lighted display of multi-coloured posters on industrial safety.

The general plan of the Survey of Ships Section took the form of a display of models showing the progress of naval architecture and marine engineering during the past century, and of full-scale mechanical, electrical, and other devices and equipment embodied in the modern merchant ship to promote safety both in navigation and propulsion and in handling cargo. The floor space available for this purpose was 90 ft. by 10 ft.

Technical officers of the Department were available during busy periods of the Exhibition to explain the exhibits to the public. It is desired to acknowledge with gratitude the generosity of the many companies and individuals who lent valuable items for display in the Department's pavilion.

GENERAL HARBOUR REGULATIONS.

The number of accidents notified under Regulation 103 of the General Harbour Regulations was 270, of which 2 were fatal accidents. The corresponding figure last year was 243, of which 4 were fatal.

One of the fatal accidents was due to a fall down an open manhole in the deck of a ship, and the other fatality was caused by a hatch beam which, becoming dislodged, struck the victim on the head.

The following is a classification of the accidents :—

Handling goods	..	..	..	..	..	..	101
Persons falling or slipping	..	..	..	..	..	..	40
Persons struck by falling or swinging loads	..	..	..	..	..	..	79
Persons stepping on or striking against fixed objects	..	..	..	..	..	..	12
Failures of gear	..	..	..	..	..	..	35
Not classified	..	..	..	..	..	..	3
							270

EXAMINATIONS 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 :—

- Electric Winding-engine Driver.
- Steam Winding-engine Driver.
- First-class Engine-driver.
- Second-class Engine-driver.
- Locomotive-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 521. Of this number, 401 were successful and 120 failed in their examinations. Four hundred and seventy-two certificates were issued, which includes 401 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.

EXAMINATION OF MARINE ENGINEERS.

During the year 182 candidates were examined for Marine Engineers' Certificates of Competency at the various centres throughout the Dominion. Of these, 61 candidates were examined for First- and Second-class Certificates of Imperial validity, and 65 candidates for Third-class and for Coastal Motor Certificates of New Zealand validity.

Candidates sitting for Imperial certificates were 30 for First-class Steam-motor, and Endorsements, of which 14 were successful and 16 unsuccessful. Of the 31 candidates for Second-class Steam and Motor, 18 were successful and 10 unsuccessful. There were two part-passes and 1 part-failure in the A Section of the new examination.

Candidates for certificates of New Zealand validity: 48 candidates were examined for Third-class, 36 being successful and 12 unsuccessful. Of the 17 candidates for Second-class Coastal Motor Examination, 12 were successful and 5 unsuccessful.

Attempts for First-class Certificates of Imperial validity: The above particulars are comprised of 18 candidates for Steam Certificates, of whom 9 were successful; 6 candidates for Motor, of whom 1 was successful; 5 candidates for Motor Endorsements, of whom 3 were successful; and 1 candidate for Steam Endorsement, who was successful.

Attempts for Second-class Certificates of Imperial validity: The foregoing return comprised 13 candidates for Steam Certificates, of whom 8 were successful; 13 candidates for Motor Certificates, of whom 9 were successful. Of 14 successful candidates for First-class Examination, 7 passed at the first attempt, 3 at the second attempt, 2 at the third attempt, and 1 at fourth and 1 at the fifth attempt; of the 17 successful candidates for Second-class Examination, 11 passed at the first attempt, 3 at the second attempt, and 3 at the third attempt.

Of the 36 successful candidates for Third-class Examination, 28 passed at the first attempt and 8 passed at the second attempt. Of the 12 successful candidates for Second-class Coastal Motor Examination, 8 passed at the first attempt and 4 at the second attempt.

The summary for First, Second, and Third-class Examinations showed 65 per cent. passed and 35 per cent. failed, which represents the same percentage passed as last year,

The remaining 57 candidates were examined for River Engineer and Restricted-limits P.V.O.S. Certificates of Competency; of these six were successful for steam-driven vessels plying within restricted limits, and forty-two were successful for service in vessels plying within restricted limits propelled by some motive power other than steam.

During the year there has been—

- (1) An increase of 16 candidates presenting themselves for Third-class Marine Examinations, representing an increase of 50 per cent.:
- (2) An increase of 9 candidates for First- and Second-class Imperial Validity Certificates, representing an increase of 17 per cent.:
- (3) An increase of 6 candidates for Coastal Motor Certificates, representing an increase of 54 per cent.:
- (4) An increase of 14 candidates for Restricted-limits Certificates, representing an increase of 30 per cent.

New rules relating to the examination of marine engineers have been printed and were issued in August, 1939, to comply with the requirements of the Board of Trade, who have since January, 1940, discontinued to hold examinations under the old system in favour of the new "Part A" and "Part B" system, which enables a candidate to sit the "A" Section for both first- and second-class examination before serving the required sea service as is necessary under the old system.

The syllabuses set out in the new regulations are definite and clear, and 5 candidates have presented themselves in New Zealand up to the 31st March, 1940, for the "A" section of the new examinations, and it is expected that the old system of examination will be discontinued in New Zealand in February, 1941.

The examination for First-, Second-, and Third-class Certificates are held at the four main centres only. Examinations for Certificates of Competency, Restricted-limits, P.V.O.S., River Engineer, and Marine-engine Driver are held at the fifteen centres throughout the Dominion.

PROSECUTIONS.

The Department instituted prosecutions in 59 cases during the year under the various statutes.

Prosecutions under the Inspection of Machinery Act comprised 4 cases; under the Shipping and Seamen Act, 4 cases; and under the Fisheries Act, 51 cases.

FISHERIES.

An account of the activities of this Branch of the Department, including a report on the Portobello Marine Biological Station, is included in the report which follows from the Chief Inspector of Fisheries and Director of Fisheries Research.

ACCOMMODATION.

At the end of the quarter the Department, in order to make room in the Customs Building for that Department, was moved to more commodious premises in the T. and G. Building, Lambton Quay. The new arrangement of accommodation made it possible to include the Fisheries Branch, the Nautical Adviser, the Examiner of Masters and Mates, and the Examiners of Marine Engineers, who were previously accommodated at different points in the city. It is possible to function much more smoothly as a complete unit once again.

Despite heavy emergency work due to the outbreak of hostilities it has not been found necessary to increase the staff of the Department, and the response to this extra effort by the whole staff throughout New Zealand is most gratifying.

I have, &c.,

L. B. CAMPBELL, Secretary.

REPORT ON FISHERIES FOR THE YEAR ENDED 31st MARCH, 1940.

SIR,—

I have the honour to submit the following report on fisheries for the year ended 30th March, 1940.

A noteworthy development to be recorded for the past year is the extended application to the fishing industry of the Industrial Efficiency Act, 1936. In the annual report for 1936-37 reference was made to the unsatisfactory condition of the industry in Auckland and elsewhere, which was one of the reasons for the setting-up of the Sea-fisheries Investigation Committee in January, 1937, and later for the issue of the first regulations* in respect of the fish industry made under the Industrial Efficiency Act by which, first, the taking of oysters, and subsequently, all fishing operations were made subject to license under the provisions of Part III of this Act. These regulations were subsequently amended† so that after 22nd July, 1938, it was necessary only for persons commencing power-fishing operations (trawling, Danish-seining, and oyster-dredging) to obtain a license from the Bureau of Industry. On 28th September, 1939, however, regulations were made (to come into force on 1st January, 1940) requiring that all persons who wished to engage or continue to engage in the fishing industry should first obtain a license from the Bureau. The licensing scheme was now extended to all fishing for purpose of sale as well as to retailers, wholesalers, canners, and exporters. All operatives in the fishing industry, whether principals or members of a crew, are included in the fishing-license scheme.

*Gazetted 4th February, 1937, and 15th April, 1937.

†The Industry Licensing (Boat-fishing Amendment notice 1938, made on 20th July, 1938, gazetted 22nd July, 1938.

A logical consequence of this regulation as it affected administration under the Fishery Acts was that the obtaining of a license from the Bureau was a necessary prerequisite to the taking-out of a fishing-boat license. The scheme has necessitated further collaboration between this Department and the Department of Industries and Commerce both at headquarters and in the ports, the Senior Fishery Officer, Mr. M. W. Young, having been mainly occupied in these liaison duties and in serving as a member of the Fish Committee advisory to the Bureau of Industry, and later also to the Controller of Food Supplies. So far as fishery operations and supplies from the fishing-grounds are concerned the new developments have not made very much difference. The regularly operating units, whether their fishery was a seasonal or an all-the-year-round occupation, have all been granted licenses on application. There has been an appreciable cutting-out, however, of the casual, intermittent, and spare-time operators and a consequent reduction in the number of persons holding licenses for fishing-vessels (see p. 28.)

From the returns received from the various ports the quantities and values of the year's production of fish, &c., have been estimated as follows :—

	Quantity					Value.
						£
Wet fish	339,231	cwt.	416,480			
Whitebait	1,837	cwt.	17,145			
Oysters—						
Dredged	75,145	sacks	54,480			
Rock	5,930	sacks	8,154			
Mussels	16,631	sacks	5,751			
Crayfish	8,071	cwt.	11,320			
Toheroa (canned products)	85,000	lb.	5,233			
Whale products—						
Oil	450	tons	9,000			
Other products	21	tons	51			
Quinnat salmon (taken by selling licensees)—						
Netted fish	811	lb.	} 244			
Angled fish	4,778	lb.				
Total value						£527,858.

Comparing the totals for the various items above with those for last year it will be seen that wet fish show a slight decline in quantity and value (4·7 per cent. and 1·9 per cent. respectively), whitebait a considerable fall of 39·8 per cent. in quantity and 32·0 per cent. in estimated value, while the quinnat-salmon netting results, owing to difficulties arising from floods, were the lowest on record, the total weight of the catch being only 8·5 per cent. of last season's unusually big total, and the inclusion of the rod-caught fish taken by selling licensees brings the total of salmon marketed to only half that of last year's net catch. Crayfish landings diminished by 12·8 per cent. in quantity and by 2·6 per cent. in value. On the other hand, all other shell-fish supplies show an increase—Dredge oysters of 11·7 per cent. in quantity and value, rock oysters, 21·8 per cent. in quantity and value, mussels, 29·2 per cent. in quantity and 77·2 per cent. in value, and toheroa packs, 22 per cent. in quantity and 41·6 per cent. in value. An increase in the whale catch is also recorded, the yield of oil being 12 per cent. higher than in 1938.

The sum total of the value of all fishery products, £527,858, is 0·7 per cent. less than the total for last year, which was £531,802.

FISHING-VESSELS : LANDINGS AND METHODS OF FISHING.

Statistical details as to kinds and quantities of fish, &c., ports of landing, fishing-vessels, and fishermen are given in the appended tables. With improved data from fishing returns it has been possible to include additional minor ports in Tables I, II, and IIc.

An analysis, according to size, method of fishing, and manner of propulsion of the vessels licensed for the year is given below, the previous year's figures being shown in brackets :—

Length (overall).	Steam-vessels.	Motor-vessels.	Row-boats.	Total.
Under 15 ft. .. .. .	..	19 (22)	84 (169)	103 (191)
15 ft. to 25 ft. .. .. .	..	136 (236)	82 (169)	218 (405)
26 ft. to 35 ft. .. .. .	..	228 (365)	..	228 (365)
36 ft. to 45 ft. .. .. .	..	131 (185)	..	131 (185)
Over 45 ft.	9 (21)	35 (46)	..	44 (67)
Totals	9 (21)	549 (854)	166 (338)	724 (1,213)

Snapper, the most important species as regards relative abundance and value, has diminished by 4,754 cwt., or by 3·4 per cent., in comparison with last year's total, and represents 39·22 per cent. of all the wet fish landed in the Dominion, as against 38·69 per cent. last year. Other decreases of note occurred with tarakihi (4,416 cwt., or 8·2 per cent.), groper (3,132 cwt., or 9·2 per cent.), and red cod (2,446 cwt., or 32·6 per cent.).

The most important increases are blue cod (5,285 cwt., or 23·2 per cent.), gurnard (813 cwt., or 10·2 per cent.), mullet (753 cwt., or 20·3 per cent.), and flounder (702 cwt., or 3·8 per cent.). The class shown in the list as "mixed round fish" amounts to 13,196 cwt., or 3·9 per cent., of the total fish landed.

Methods of Capture.

Of the total catch, 58,504 cwt. (17·2 per cent.) was landed from steam-vessels (principally trawling), motor-vessels accounted for 276,115 cwt. (81·4 per cent.), and row-boats 4,612 cwt. (1·4 per cent.).

The total fish caught by each of the more important methods of fishing is shown in the following analysis:—

Method of Fishing.	Quantity.		Value.	
	Hundredweight.	Percentage of Total.	£	Percentage of Total.
Trawl	94,765	27·9	116,334	27·9
Danish seine	126,702	37·3	132,516	31·8
Long- and hand-lines ..	85,808	25·4	119,896	28·8
Set-nets and drag-nets or seines	31,956	9·4	47,734	11·5
Totals	339,231	..	416,480	..

Comparing the quantities taken by each method with those for the year 1938-39 it will be seen that trawl-caught fish declined from 119,873 cwt. to 94,765 cwt. and long- and hand-line catches from 87,172 cwt. to 85,808 cwt., while Danish seine-caught fish increased from 119,933 cwt. to 126,702 cwt., and set-net and seine catches from 29,136 cwt. to 31,956 cwt.

Two-thirds of the trawl catch was made up of tarakihi, sole, snapper, and gurnard, the respective percentages being 41·6, 13·6, 5·6, and 4·6. Of the Danish-seine catch 78·4 per cent. consisted of snapper, while tarakihi formed 7·3 per cent.

Snapper, flounder, and mullet were the principal species in the set- and drag-net landings, contributing together 83·7 per cent. of the total landed, while groper, blue cod, and snapper headed the line catches, the percentages being 33·5, 32·7, and 14·5 respectively.

A statement in tabulated form follows showing the total quantity and percentage of wet fish landed during each month of the year. It will be noted that the proportion of Danish-seine-caught fish increased considerably in July, August, and September, and reached a peak in October, when the percentage was 47·31 (almost half the total quantity of fish landed during that month).

With regard to the monthly totals, it will be seen that the most productive months were August, October, April, May, and September, while the months of least fishing activity were January, December, March, July, and February.

Month.	Trawl.		Danish-seine.		Long- and Hand-line, Set and Drag Net or Seine.		Total.	
	Hundred-weight.	Percent-age.	Hundred-weight.	Percent-age.	Hundred-weight.	Percent-age.	Hundred-weight.	Percent-age.
April	10,701	34·70	7,055	22·87	13,092	42·43	30,848	9·1
May	11,025	35·64	8,355	27·01	11,553	37·35	30,933	9·1
June	7,384	25·06	10,337	35·09	11,742	39·85	29,463	8·6
July	6,827	26·76	10,451	40·97	8,233	32·27	25,511	7·5
August	8,798	24·76	16,383	46·11	10,348	29·13	35,529	10·5
September	6,998	22·84	14,391	46·96	9,255	30·20	30,644	9·0
October	7,244	22·36	15,328	47·31	9,824	30·33	32,396	9·6
November	7,705	25·91	11,694	39·32	10,340	34·77	29,739	8·8
December	7,701	32·88	8,784	37·51	6,935	29·61	23,420	6·9
January	5,348	27·45	7,502	38·51	6,633	34·04	19,483	5·8
February	7,384	28·65	9,147	35·50	9,237	35·85	25,768	7·6
March	7,650	30·00	7,275	28·53	10,572	41·47	25,497	7·5
Total	94,765	27·9	126,702	37·3	117,764	34·8	339,231	..

Landings at Ports.

Of the total quantity of wet fish taken, 40·8 per cent. was landed at Auckland (excluding Manukau and Coromandel). The most important increases occurred at Stewart Island, 3,512 cwt., or 55·5 per cent.; Thames, 2,200 cwt., or 12·8 per cent.; Waikawa, 1,556 cwt., or 70·2 per cent.; Bluff, 1,335 cwt., or 97·6 per cent.; Timaru, 1,007 cwt., or 7·2 per cent.; Lake Ellesmere, 746 cwt., or 45·1 per cent.; and Nelson, 703 cwt., or 22·1 per cent. The principal decreases were Port Chalmers, 11,377 cwt., or 49·7 per cent.; Auckland, 10,413 cwt., or 7·0 per cent.; Napier and district, 1,947 cwt., or 12·3 per cent.; Riverton, 1,146 cwt., or 69·0 per cent.; Moeraki, 967 cwt., or 33·5 per cent.; Oamaru, 890 cwt., or 35·1 per cent.; Tauranga and district, 769 cwt., or 12·8 per cent.; and Nuggets, 728 cwt., or 25·8 per cent.

Auckland.—The three steam-trawlers operated during the first six months of the year, making 44 landings in comparison with the 85 landings made during 1938-39. The trawler voyages were divided between the Hauraki Gulf grounds, Bay of Plenty, and East Coast (East Cape to Gisborne) in the proportion of about 7 landings from the East Coast to every 2 from the Bay of Plenty and 1 from the Hauraki Gulf.

Of the total landings at Auckland, trawl-caught fish represented 13·8 per cent., Danish-seined fish 82·4 per cent., while line-fishing vessels and net-fishing vessels landed 2·7 per cent. and 1·1 per cent. of the total respectively.

Comparative figures for the total landings (including those from Manukau and Coromandel) and for the three categories, snapper, tarakihi, and flounder for the last six years are given below:—

	1934-35.	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Total quantity landed	102,313	129,209	159,371	140,234	150,730	140,588
Snapper	68,432	88,374	112,656	97,296	107,252	101,006
Tarakihi	14,293	18,100	24,966	24,240	22,530	20,981
Flounders (including dabs)	6,550	7,560	3,743	4,968	7,082	8,680

The flounder total, with which is included the category returned as "mixed flat fish," exceeds the previous year's total by 22·5 per cent. and that of 1935-36, which was the best year since the 1932-33 total of 10,452 cwt., by 14·8 per cent. Of the flounder catch, 88·1 per cent. was landed from the Danish-seiners. The tarakihi catch is the lowest since 1935-36. Of the 20,981 cwt. landed, 12,652 cwt., or 60·3 per cent., was taken by the steam-trawlers during the six months they were in operation.

Thames.—The returns for this port indicate an increase of 12·8 per cent. The total quantity and value, and the landings for the two principal kinds of marketable fish during the last six years, are shown in the following table:—

Fish landed at Thames.	1934-35.	1935-36.	1936-37.	1937-38.	1938-39.	1939-40.
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Total wet fish	17,614	19,134	15,447	18,692	17,199½	19,399
Snapper	11,163	14,053	11,356	13,400	11,123	14,153
Flounder (including dabs and mixed flat fish)	4,769	3,305	3,216	3,998	5,157	4,331
	£	£	£	£	£	£
Total value	13,957	14,593	16,690	23,174	23,616	24,501

An improvement in the snapper landings, a falling off in the flounder catch, and the recording of the highest value for the total catch since the year 1930-31 are the main features of the year at Thames.

Tauranga.—Compared with 1938-39, the Tauranga catch shows a decline of 769 cwt. The percentage of Danish-seine-caught fish has risen from 57·1 per cent. of the total catch to 65·1 per cent., and line-caught fish has fallen from 32·9 per cent. to 25·4 per cent. The steady falling off in the line landings is shown below:—

	Quantity Landed by Lines. Cwt.	Percentage of Total.
1937-38	1,944	66·3
1938-39	1,977	32·9
1939-40	1,331	25·4

Gisborne.—An increase of 11·1 per cent. is recorded in the Gisborne total, although the number of fishing-boat voyages was fewer than in 1938-39.

Crayfish catches at Gisborne have fallen from 622 cwt. in 1937-38 and 394 cwt. in 1938-39 to 376 cwt. The effect of the Industrial Efficiency Regulations caused the crayfish market, during the latter part of the year, to depend more on the trawlers for its supply, and this explains the increase, amounting to 51·5 per cent. of the crayfish landed by the trawlers, in comparison with the previous year.

Napier.—A drop of 12·3 per cent. is recorded in the total quantity of fish landed at Napier and in the district. Danish-seine landings fell from 303 to 215 and line landings from 1,165 to 639. The quantity of line fish taken fell from 37·6 per cent. to 25·9 per cent. Trawler landings increased from 958 to 1,327.

Wellington.—Two steam-trawlers and one part-time motor-trawler operated from Wellington. The steam-trawlers made 124 landings in comparison with the 109 recorded in 1938-39, and brought in 69·9 per cent. of the total quantity of fish landed. Tarakihi constituted 69·5 per cent. of the catch, moki 5·6 per cent., barracouta 5·6 per cent., red cod 3·2 per cent., and hake 2·8 per cent. The average landings of long-line boats in Wellington show an increase with regard to groper and decreases in respect of hake and ling.

Making 7 landings at Wellington during the year, the fish-carrier "South Sea" brought a total of 9,565 cwt. blue cod and 71 cwt. groper, valued at £5,503, from the Chatham Islands.

French Pass.—Returns from the French Pass district give a total of 2,556 cwt., compared with the previous year's total of 2,649 cwt. The landings for the individual species are much the same except that blue cod has increased by 163 cwt. and snapper has fallen off by 226 cwt. Landings at the French Pass totalled 876, a reduction of 0·6 per cent.

Otago District.—The quantity of fish landed in the Otago district is 34·4 per cent. less than in the previous year. The reduction is almost entirely accounted for by the fact that the steam-trawler "Hananui" was not in operation for eleven months of the year. In comparison with the previous year, Karitane and Taieri Mouth totals are much the same, the Port Chalmers' catch declined by 49·7 per cent., and the Nuggets' catch by 25·8 per cent., while the Waikawa landings increased by 70·2 per cent. Of the total quantity of fish (20,189 cwt.) landed in the Otago district, 59·5 per cent. was made up of flat fish.

EXPORTS AND IMPORTS.

Exports and imports are shown in Table V (p. 35), which gives details as to quantities and values of various classes of fishery products exported and the ports from which they were shipped.

While the value of the total imports, consisting largely of canned products, has fallen from £262,916 for last year to £164,611, a decline of 37·4 per cent., the value of the total exports of New Zealand fish and shell-fish is £149,882, as compared with £171,570 for 1938-39, a fall of £21,688, or 12·6 per cent.

The comparatively small export of fresh oysters* has risen to 64,210 dozen (approximately equivalent to 1,000 sacks or 3,000 bushels) from 33,466 dozen, the value of the total being 86·9 per cent. higher than that of last year. Frozen fish show a decline from 43,213 cwt. to 35,552 cwt. in quantity and from £139,743 to £119,999 in value, a falling-off of 17·7 per cent. and 14·1 per cent. respectively. This includes crayfish, which fell from 583 cwt., valued at £1,631, to 293 cwt., valued at £968. Smaller quantities of blue cod, snapper, tarakihi, and "other kinds" were shipped this year, the decline being due mainly to the absence of some of the larger steam-trawlers over the last six months of the year. This is indicated by the greater declines being shown for the classes tarakihi and snapper than for blue cod and flounder, the export of which have shown very little change, the value of flounder exported showing a slight increase on the figure for 1938-39. Exports of oysters preserved in tins substantially increased, from 182,451 lb. to 291,760 lb. (59·9 per cent.) in quantity and from £9,356 to £15,750 (68·3 per cent.) in value. Exports of tinned toheroa reached a total of 63,202 lb., valued at £3,887, representing increases of 49·4 per cent. and 24·9 per cent. respectively. On the other hand, shipments of canned crayfish fell from the respectable total of 30,600 lb. (valued at £2,678), to 4,599 lb. (value, £408), which are respectively 15·0 per cent. and 15·2 per cent. of the figures for 1938-39. Exports of tinned whitebait also declined from 111,493 lb. (value, £14,917) to 48,983 lb. (value, £7,953), which is a fall of 55·2 per cent. in quantity and 49·1 per cent. in value.

ROCK OYSTERS.

The picking of rock oysters for the 1939 season was begun on 1st June and finished on 31st August, the depot in Auckland being open for sales from 15th June to 2nd September. The condition of the oysters this year, especially those from the Hauraki Gulf and the Bay of Islands, was exceptionally good. The total of 5,930 sacks produced was the highest since 1929, when 6,240 sacks were marketed. This season's total falls below the average for the five years 1926-30 by less than 1 per cent., but exceeds the average production for the five years 1931-35 inclusive by over 36 per cent. The average for the immediately preceding five years is exceeded by 45 per cent. There has been a steady recovery since 1935, when the production for market reached the lowest figure recorded of 3,037 sacks. The decline was in all probability due to a succession of bad or poor spawning seasons, and it is now evident that the beds had been overpicked in the attempt to meet market demands during a period when propagation was below normal. The recovery now definitely in evidence may be ascribed to the natural increase resulting from two or three favourable spawning seasons in a decade, the augmented supplies from cultivated sections and, added to these, careful and conservative picking in connection with which credit must be given to the conscientious work of local inspectors, overseers, and the oyster-pickers themselves. Details as to the quantities taken from the various areas are shown in Table III (see page 34).

* The export of rock oysters is permitted only with the consent of the Minister of Marine.

OYSTER-CULTIVATION.

The statement which follows shows the nature, the locality, and the cost of oyster-cultivation work done during the year.

Oyster-cultivation for the Year ending 31st March, 1940.

Area.

- I. Bay of Islands: 780,000 borers and 3,440 pupus destroyed, 14,577 square yards of rock cleared of weed, 295 square yards of rock cleared of dead shell, and 1,494 square yards of new bed laid down. Cost, £399 12s.
- II. Whangarei: 157,200 borers and 946 pupus destroyed, 3,001 square yards of rock cleared of weed, 372 square yards of rock cleared of dead shell, 20 square yards of oyster-bearing rock moved to a better position, 1,111 square yards of clean rock laid down, and 1,999 square yards of mixed oyster-bearing and clean rock laid down. Cost, £35 4s.
- III. Kaipara: 127,500 square yards of new bed laid down. Cost, £3,995 15s.
- IV. Takatū to Gull Point: 139,600 borers and 96 pupus destroyed, 472 square yards of rock cleared of dead shell, and 1,909 square yards of oyster-bearing rock thinned out (stunted oysters and dead shell removed). Cost, £38 8s.
- V. Tamaki: 129,100 borers and 38 pupus destroyed. Cost, £9 12s.
- VI. Coromandel: 610,500 borers and 4,892 pupus destroyed, 1,283 square yards of rock cleared of weed, and a number of concrete posts erected. Cost, £2 8s.
- VII. Kawau: 200 concrete posts erected and 270 concrete posts removed to Coromandel. Cost, £12.
- VIII. Rakino: 186,000 borers and 92 pupus destroyed. Cost, £14 8s.
- X. Motutapu: 258,000 borers and 76 pupus destroyed. Cost, £16 16s.
- XII. Motuhi: 210,000 borers destroyed and 1,100 square yards of rock cleared of small mussels. Cost, £28 16s.
- XIII. Waiheke: 1,609,800 borers and 139 pupus destroyed, 326 square yards of rock cleared of dead shell, 6,550 square yards of rock cleared of weed, and 116 yards of capstones spread. Cost, £150 8s.
- XIV. Ponui: 1,092,000 borers and 301 pupus destroyed, 2,476 square yards of rock cleared of weed, and 88 square yards of clean rock moved to lower level. Cost, £110 8s.
- XV. Patiki: 523,700 borers destroyed and 200 pupus destroyed. Cost, £21 12s.
- XVI. Great Barrier: 284,800 borers destroyed, 359 square yards of rock cleared of weed, 566 square yards of clean rock moved to a lower level, and 2,475 square yards of drift bed formed. Cost, £70 8s.

Total for all Areas: 5,425,700 borers and 10,211 pupus destroyed, 28,556 square yards of rock cleared of weed, 1,465 square yards of rock cleared of dead shells, 116 yards of capstones spread for better feed, 20 square yards of oyster-bearing rock moved to a better position, 1,765 square yards of clean rock moved to a lower level, 1,999 square yards of mixed oyster-bearing and clean rock laid down, 2,475 square yards of drift-bed formed, 128,994 square yards of new beds laid down, and 1,100 square yards of rock cleared of small mussels. Total cost, £4,932 12s.

It will be seen that an especially extensive area of 127,500 square yards of new oyster-beds was laid down in the Kaipara (in the Port Albert arm of that harbour) at a cost of £3,995. This was the biggest operation so far undertaken. It was recommended by the Fisheries Investigation Committee and was decided upon for the following reasons: The results of earlier cultivation of a similar type showed that good production could be achieved, although at least five years must elapse before marketable oysters are obtained. A considerable area of previously unproductive beach was available and the bigger-scale undertaking was possible at a lower relative cost than would have been the case for a smaller one. There is, and will probably continue to be, a greater demand for rock oysters than can possibly be satisfied by the produce of the natural beds which at present, with only the slight amount of artificial assistance that is normally necessary, provide the greater part of our supplies.

DREDGE OYSTERS.

By an Order in Council passed on 20th December, 1938, the close season for the Foveaux Strait oyster fishery was extended to include the first fortnight in February. This step was taken (1) because many complaints had been received from dealers about the difficulty of handling and transporting oysters in the hot weather, and (2) because the opinion of this Department was that the recently increased exploitation of the oyster-beds of Foveaux Strait had reached a degree of intensity that could probably not be maintained without depleting and deteriorating the stocks. A curtailing of the fishing season was deemed to be the most satisfactory way of applying a restriction. The closing of certain overworked areas which had been suggested by the majority of those interested in the industry at the Bluff had been carefully considered, but was abandoned because of the impossibility of indicating prohibited areas by suitable marks and owing to the absence of any efficient means of patrol. In spite of this curtailment and in spite of the fact that the licensing under the Industrial Efficiency Act of those operating oyster-dredgers had placed a check upon the expansion of the fleet, which was being stimulated by trade competition, the total quantity of oysters landed at the Bluff during the 1939 season reached a new record total of 75,145 sacks (or 225,435 bushels), valued at £54,480, an increase of 7,902 sacks over the previous maximum of 67,243 sacks for 1938. Eleven vessels worked through the season, which finished at the end of September. The total number of landings was 1,467, which is 67 less than the total for the previous season. The month of August provided the highest number of landings (252) and July the lowest (161).

In marked contrast to the previous season the quality of oysters this year was exceptionally good. The fishing was also more successful, and it appeared that the stock of oysters on the beds had undergone an appreciable increase since last year. In these circumstances the oyster-vessel owners expressed the view that there was no need for the survey of the oyster resources of Foveaux Strait for which preliminary plans had been made in the Fisheries Branch of the Department. This was done in accordance with the recommendation made by the Sea Fisheries Investigation Committee in its report of December, 1937, which urged that "No further license (under the Industrial Efficiency Act) be issued until a survey of the beds has revealed that the stocks will stand up to additional abstractions." It was further suggested by the Committee that "a complete survey of the known oyster-beds be undertaken during the period October, 1938, to February, 1939, such survey to be a co-operative effort between the merchants and the Government." Also, "That a further survey be conducted, again by co-operative effort, to establish the existence of new oyster-beds within working distance of Bluff." While confronted with the adverse conditions of the 1938 season there was a general unanimity of opinion among the members of the oyster industry at Bluff that these recommendations should be carried out. There was, moreover, an expression of willingness to co-operate as suggested. But now *laissez-faire* is once more the word. I consider that there is a danger in this return to an attitude of easy-going optimism. It would appear that exceedingly favourable natural conditions for oyster production and growth have brought about a recent improvement. The actual factors responsible for successful oyster-propagation in this area have not been elucidated by investigation. We only know on general principles that it is probably a matter of water temperatures and the presence of sufficient and suitable minute organisms for the nourishment of the larval and fixed oysters. There is always the possibility that a succession of unfavourable spawning-seasons may occur. When such is the case beds that have been overexploited are likely to remain in a chronic state of depletion owing to the lack of a sufficient reserve of brood-stock. With regard to the suggestion that the production of oysters in New Zealand might be increased by artificial culture, it may be pointed out that cultivation methods are relatively costly, while our oysters from the natural beds are comparatively cheap.

TOHEROA.

Both canneries operated during the winter season of 1939, though with increased working difficulties owing to the reduced density of the stocks on the Ninety-mile and North Kaipara beaches. The total pack amounted to approximately 85,000 lb. of toheroa products, valued at £5,233.

In the annual report for last year the importance of an adequate stocktaking in respect of our toheroa resources was emphasized. This is especially important at the present time, when all the West Coast beds are reduced as a result of the great mortality that occurred in the autumn of 1938, and at the same time more would-be consumers and even would-be commercial exploiters are finding their way to the beaches.

The history of the exploitation, which has usually been overexploitation, of shell-fish stocks and, indeed, of most wild-life resources anywhere in the world, teaches one lesson most clearly, and that is the importance of maintaining an adequate breeding-stock—of not taking more from the population than its breeding-units can replace by natural reproduction. This is a comparatively simple matter in farm husbandry; in wild-life conservation it involves much more complicated problems, and is therefore usually neglected until exploitation has got ahead of conservation. It is better national economy to err on the side of overconservation than otherwise. Those who are not directly interested in the resources in question do not appreciate this; those who are directly interested frequently have to be made to do so by coercion under the law. Before the motor-car era toheroa-conservation took care of itself and was too easy a matter to make any demand on departmental activity. With the multiplication of motor traffic to the beaches it became too hard a job for existing departmental resources to cope with, and the restrictive regulations, though they were moderate and reasonable, were too often disregarded with impunity. It became evident during the past year that more drastic restrictions were necessary, and in the consolidated Sea Fisheries Regulations issued in October, 1939, a total closure of the toheroa-beds on the North Kaipara beach, in the Bay of Plenty, and on the West Coast of the Wellington provincial district till December, 1940, was prescribed. Elsewhere "bag limits" were reduced and steps were taken to strengthen the ranging personnel. This has always presented difficulties owing to the necessity of providing for expensive transport. It is only by a general recognition on the part of the majority of the beach-visiting public of the need of preserving such assets from over-exploitation that conservational requirements can be adequately met and these resources preserved for posterity. It is pleasing to record that in many quarters there is evidence of this recognition and of a desire to assist the Department in its conservational measures. There have also been some cases of non-recognition in practice which have incurred the penalties of the law.

WHITEBAIT.

The whitebait season for 1939, with a total yield estimated at 1,837 cwt., was the poorest on record. Only in 1936, when it was 1,888 cwt., has the estimated total production fallen previously below 2,000 cwt., the decline then being due largely to subnormal supplies from Westland rivers. Only four centres have shown an increase over last year—namely, Napier, Blenheim, Christchurch, and Invercargill. The estimated total for the Waikato this season was only 322 cwt., as compared with 1,171 for the 1938 season. The other important source of whitebait-supplies is Westland. Here the amounts handled at the three chief centres of Westport, Greymouth, and Hokitika together amounted to only 634 cwt., as compared with 965 cwt. for 1938, the fishing in the Westport and Hokitika districts and in South Westland having been especially disappointing, although Greymouth provided local catches that were up to the average of recent years and also received additional supplies brought by air from South Westland.

The statement that follows gives a summary of information and estimated catches returned by local fishery officers:—

Whitebait Fishery: 1939 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.	
Auckland ..	Waikato	Hand-nets ..	?	?	80	40	Cwt. 322
Auckland ..	Kaituna	Hand-nets ..	?	?	..	..	33
Auckland ..	Tarawera and Rangitaiki	Hand-nets ..	?	?	..	..	65
Napier ..	Tukituki, Ngaruroro, Wairoa	Set-nets ..	1st July ..	October ..	20	35	71
New Plymouth	Mokau, Waitara, Mimi, Tongaporutu, Waiwakaiho, Urenui, Oakura, Stoney, Waiongona	Hand and set nets	1st July ..	October–November	..	100	50
Wanganui ..	Wanganui ..	Hand-nets ..	July ..	October ..	..	20	10
Foxton ..	Manawatu ..	Hand and set nets	August ..	September ..	20	..	9
Wellington ..	Waikanae, Waimiba, Otaki, Waitotahu, Waikawa, Ohau, Hokio, Rangitikei, Hutt, Ruamahunga	Hand and set nets	August ..	August–September	47	..	18
Blenheim ..	Wairau, Rose's overflow, Opawa, Tuamarina	Hand-nets ..	October ..	October ..	12	60	72
Nelson ..	Motueka, Moutere, Takaka, Motupipi	Hand and set nets	{ August .. August ..	{ October .. September ..	9 4	6 4	35 14
Westport ..	Buller, Orawaiti, Mokihinui, Big Totara, Little Totara	Hand-nets ..	September	October ..	12	150	77
Greymouth ..	Teremakau, Grey ..	Hand-nets ..	August ..	October ..	1	200	169
Hokitika ..	Hokitika, Arahura, Mahinapua, Totara, Waimea, Waite, Okuru, Waitaha, Wataroa	Hand and set nets	August ..	October ..	50	83	388
Christchurch ..	Waimakariri, Styx, Ashley, Saltwater Creek, Kaiapoi, Avon	Hand and set nets	August ..	November ..	20	?	241
Temuka ..	Opihi, Orari ..	Set-nets ..	August ..	September ..	..	25	39
Oamaru ..	Kakanui	Hand-nets ..	October ..	November–December	..	6	11
Dunedin ..	Molyneux, Taieri, Kakanui, Waipori, Waikouaiti, Waikawa, Shag, Tokomairiro, Pleasant, Wainakarua	Hand-nets ..	August ..	October–November	16	?	133
Invercargill ..	Mataura, Oreti, Aparima, Waiau, Titiroa, Makarewa	Hand and set nets	August ..	October–November	46	?	180
							1,837

As to the factors responsible for this deficiency, various causes have been suggested which might have operated in some degree. Bad weather and flooded rivers during the period of the whitebait runs operated to some extent as they generally do. If such handicaps on fishing activities did not operate it is certain that the species would be a good deal less abundant than it is, especially in the more remote places where official surveillance over fishing operations is almost entirely lacking. Natural conditions, especially climatic and meteorological variations from the normal, undoubtedly affect whitebait propagation, as they also affect the propagation of salmon, trout, or oysters. In this connection it may be mentioned that the writer anticipated a poor whitebait season following the very abnormal drought in many parts of the Dominion, including the Waikato and Westland areas, in the autumn of 1939 when the spawning of *inanga* takes place from which the whitebait runs of the following spring season are derived. Experienced Maori observers of the habits of *inanga* in the Waikato expressed agreement with this forecast. It may be noted that the Hawke's Bay, Marlborough, and Canterbury districts, where the whitebait catches of 1939 showed an improvement on those of the previous year, are districts which normally experience dry autumns and where, in consequence, the habits and habitats of *inanga* would be less likely to be rendered abnormal by drought conditions. Such speculations as these, however, require further confirmation by more detailed systematic and continuously recorded observations than we have hitherto been able to make. Records of variations in the whitebait runs from year to year are a much needed *desideratum* in this connection, and it is for this reason, as well as for directly conservational objects, that further amendments to the whitebait regulations are needed, and have been recommended.

Regulations have been drafted which, besides introducing measures for the prevention of undue depletion by fishery operations and for preventing individual fishermen from enjoying advantages not shared by others, involve placing the whitebait fishery under a licensing system, a system which has long been advocated with virtual unanimity by all those who take part in the whitebait fishery as a serious occupation. An important object of these proposals is to enable us to get a proper record of the yield of the more important whitebait rivers from year to year in order that production and reproduction may be correlated with variations in natural conditions and with fishing intensities. It is hoped that these regulations may be brought into force for the 1940 season. For whitebait-supplies, as for various other natural assets, the time has passed when the bounty of Nature should be regarded as belonging to nobody and everybody and therefore to be exploited by all and sundry in a something-for-nothing racket.

FRESH-WATER FISHERIES.

Quinnat Salmon.

Owing to the low volume of the Waitaki River and an almost complete absence of the floods which prevent productive angling, the salmon-fishing season in the early months of 1939 had been exceptionally successful and it provided record catches to anglers in the lower reaches of the river. As a result of these conditions, however, the number of salmon running into the Hakataramea was much below the average. When the rack was being constructed at the usual site in the tributary a short distance above its confluence between 11th April and 20th April both rivers were very low, and most of the fish remained to spawn in the main river below the junction. The first salmon at the rack was observed on 21st April. The fish taken for stripping and the number of ova taken for the hatchery were as follows :—

—				Males.	Females.	Ova.
April (21st to 30th)	..	..	..	34	40	161,000
May .. .. .	..	..	..	124	126	419,000
Totals .. .. .	..	..	..	158	166	580,000

In addition to those which were stripped for ova and milt, 52 males and 36 females in April and 133 males and 115 females in May were allowed to pass the rack to spawn naturally in the Hakataramea River. The runs consisted of unusually small fish, those of larger size apparently preferring to remain in the main river rather than swim through the very shallow channel at the mouth of the tributary.

The hatchery output for the season provided 414,000 salmon fry which were planted in the Hakataramea River, 46,000 ova shipped to Melbourne, and 20,000 fry kept for rearing to yearlings in the ponds.

The angling season in the early months of 1940 was in complete contrast to that of the previous year in that the principal quinnat-salmon rivers were almost continuously turbid and in flood. The conditions were such that neither rod-fishermen on the Waitaki, Rangitata, Rakaia, and Waimakariri, nor the netsmen, whose operations were confined to the tidal waters of the last-named river, had many opportunities for successful fishing.

Information from returns sent in by rod and net fishermen holding licenses permitting them to sell quinnat salmon is summarized in the statement below :—

Quinnat Salmon, 1940.

—				Males.	Females.	Sex not given.	Totals
<i>Returns from Rods.</i>							
Rakaia River, 9/3/40 to 30/4/40 (four rods)—							
Number of fish caught	..	..	..	99	99	11	209
Total weight .. .. .	..	..	..	1,241.5 lb.	1,365 lb.	120.5 lb.	2,727 lb.
Average weight .. .. .	..	..	..	12.5 lb.	13.9 lb.	10.9 lb.	13.0 lb.
Ashburton River, 20/2/40 to 29/2/40 (two rods)—							
Number of fish caught	..	..	..	3	4	..	7
Total weight .. .. .	..	..	..	39 lb.	57 lb.	..	96 lb.
Average weight .. .. .	..	..	..	13.0 lb.	14.2 lb.	..	13.7 lb.
Rangitata River, 16/2/40 to 21/4/40 (four rods)—							
Number of fish caught	..	..	..	39	42	..	81
Total weight .. .. .	..	..	..	556.5 lb.	560.5 lb.	..	1,117 lb.
Average weight .. .. .	..	..	..	14.3 lb.	13.3 lb.	..	13.8 lb.
Orari River (one rod)—							
Number of fish caught	..	..	..	3	4	..	7
Total weight .. .. .	..	..	..	43 lb.	41 lb.	..	84 lb.
Average weight .. .. .	..	..	..	14.3 lb.	10.2 lb.	..	12.0 lb.
Opihi River, 12/2/40 to 10/4/40 (two rods)—							
Number of fish caught	..	..	..	..	..	56	56
Total weight .. .. .	..	..	..	..	..	754.5 lb.	754.5 lb.
Average weight .. .. .	..	..	..	..	..	13.5 lb.	13.5 lb.
Combined Rivers, 12/2/40 to 30/4/40 (thirteen rods*)—							
Number of fish caught	..	..	..	144	149	67	360
Total weight .. .. .	..	..	..	1,180 lb.	2,023.5 lb.	875 lb.	4,778.5 lb.
Average weight .. .. .	..	..	..	13.0 lb.	13.6 lb.	13.0 lb.	13.3 lb.
<i>Returns from Nets.</i>							
Waimakariri River, 20/2/40 to 4/4/40 (two nets)—							
Number of fish caught	..	..	..	30	38	1	69
Total weight .. .. .	..	..	..	376.5 lb.	423.5 lb.	11 lb.	811 lb.
Average weight .. .. .	..	..	..	12.5 lb.	11.1 lb.	11.0 lb.	11.7 lb.

* Two rods fished on two rivers during the season.

A total of 4,778 lb. of salmon was taken by thirteen rod-fishers from five rivers, and only 811 lb. from two nets from the Waimakariri. In spite of adverse conditions, the average catch of the rod-fishers for the season compares not unfavourably with most of those recorded for previous years, but the netting results are the worst on record. It appears that the channels giving access to the Waimakariri Mouth from the sea were rendered unattractive to salmon owing to the effects of the very heavy floods. Probably for this reason many salmon were recorded for the first time in the Ashley River. Other small rivers in which runs of salmon took place were the Ashburton, Orari, and Opihi. The last mentioned has, in fact, of recent years become a recognized quinnat-fishing resort. Records of the catches in the tidal waters of the Rangitata and Opihi Rivers were kept by Mr. F. W. Pellett, Inspector of Fisheries, Temuka, to whom we are indebted for data for the statement which follows showing the incidence of catches for (approximately) each third of the successive months of the season :—

	February, 1940.			March, 1940.			April, 1940.		
	1st-10th.	11th-20th.	21st-29th.	1st-10th.	11th-20th.	21st-31st.	1st-10th.	11th-20th.	21st-30th.
Rangitata River	4	..	..	93	16	..	..	..
Opihi River	17	36	57	90	60	20	3	..

The comparative totals, 283 for the Opihi and 113, taken at broken intervals, for the Rangitata, indicate the conditions for rod-fishing and in no way reflect the numbers of fish running. By the end of the angling season the upper waters and tributaries of the Rangitata, Rakaia, and Waimakariri were well stocked with spawning fish which, in the absence of factors adverse to successful reproduction, should provide good stocks of the 1940 year-group. Salmon also appeared in greater numbers than usual in the Manawatu River (West Coast, North Island), and one was caught, the first to be recorded, in the Otaki River.

Atlantic Salmon.

The 1939 hatchery season at Te Anau was one of the best experienced for many years. Damage to the foundations of the rack by a previous flood in the Upukororo River had to be repaired before the construction of the rack could be commenced. The rack was commenced on 4th April and completed on 13th April. A spate on 17th April immediately induced a run of salmon, and by the end of the month 180 fish had been trapped. The river remained low during May and June with a low temperature, which fell to 2° C. in July. The record of the fish trapped was as follows :—

					Males.	Females.	Ova taken for Hatchery.
April (17th to 30th)	..	..	..	..	61	119	..
May ..	..	..	..	..	16	34	..
June ..	..	..	..	..	26	34	..
July ..	..	..	..	..	10	55	..
Totals ..	..	..	..	..	113	242	707,500

Trapping was discontinued on 31st July, when all available accommodation in the hatchery was occupied.

The comprehensive records of anglers' catches that are so desirable and necessary for a proper appreciation of the situation regarding the condition of the salmon stock are still lacking, but it may be said that the fishing has probably quite maintained the improved standard that was recorded for last season. Anglers have made good catches in Lake Te Anau and in the Waiau River, and the quality of the salmon has been uniformly high, several well-conditioned fish of 8 lb. and some over 9 lb. having been taken. One may also record that dry-fly fishing in the Waiau River has produced good results in the capture of Atlantic salmon, as well as rainbow and brown trout.

General.

Apart from the quinnat and Atlantic salmon fisheries, which have been the special concern of this Department since their successful naturalization at the beginning of the century, the Marine Department has no direct practical or controlling connection with river and lake fisheries beyond its advisory function in respect of fresh-water fishery regulations made by Order in Council under the authority of Part II of the Fishery Act, 1908. The initiative for particular local regulations comes from the executives of acclimatization societies* who are responsible for administrative control and management in their respective districts, but contacts and collaborative liaisons with some of these executives have been facilitated of late years, since District Inspectors of Fisheries have been functioning in the Wellington, Canterbury, and Otago districts, and especially since the Fresh-water Research staff of the Department came into being in 1937. Collaboration has also been the normal relationship between our salmon hatchery staffs and the acclimatization society staffs in the districts served by our fish culture stations at Hakataramea and Te Anau.

'This anglers' paradise of ours was created about seventy years ago by the pioneers of trout acclimatization, but almost the entire responsibility for its maintenance (*i.e.*, the provision of suitable habitats in our numerous streams and lakes with conditions favourable for the propagation of new generations of trout and for their adequate nourishment at all stages of growth) fell upon a generously responsive Nature—Nature that remained for many years in a state primeval and unspoiled. But this is no longer the case; and this is the reason for the increase in the difficulties connected with fishery maintenance, difficulties that are also intensified by the great increase in the number, skill, and mobility of our anglers. Some of the difficulties arise from factors inimical to the maintenance of ideal fishing-waters that are inevitable and unavoidable as occupation and cultivation of lands and industrial developments bring about changes in the character of water-sheds, river-beds and banks, and, in degrees that vary from place to place and from time to time, in the flow and quality of the water itself. It is necessary, however, to distinguish between changes that are inevitable and those which could be minimized, if not entirely avoided, by taking thought and taking steps based on understanding.

Pollution of Rivers.

A great deal of the pollution that has found its way into some of our fishing-waters from sawmills, dairy factories, abattoirs, wool-scouring works, sheep-dips, and other sources of noxious or putrefiable material could have been avoided, and probably would have been avoided, if those responsible had been aware of the harm they were doing and had been given any guidance as to methods of dealing with their trade wastes otherwise than by letting them go into a conveniently adjacent stream. One might almost say that such mischief has been done absent-mindedly. For very many years there have been laws and regulations, on paper, which prescribe penalties for pollution, but they have been largely unaccompanied by any provision by which offences may be detected. Polluting effects which may bring about a considerable degree of deterioration in a fishing-water often act insidiously over a long period and are not detectable as a poacher who takes fish by illegal methods is detectable. To penalize after an offence has been committed and proved is, in any case, not the ideal way of dealing with the problem, but it is the only way of dealing with it for which legal and administrative provision has been made up to the present.

A not inconsiderable part of the work of our District Inspectors has been the observation and study of existing sources of pollution, taking prosecutions where clear evidence of material damage is obtained. Our main object, however, has been to find out by what practicable methods the pollution can be prevented, and advising accordingly. There is much work still to be done in this direction. However, with accelerating industrial development, it would appear that the time is ripe for giving consideration to legislation by which those who are contemplating the establishment of any plant that will produce waste material that would be detrimental if allowed to find its way into a neighbouring stream may be required to make in their plans satisfactory provision for the disposal of their wastes so that the stream may not be contaminated or liable to contamination.

RESEARCH.

Fresh-water Fisheries.

The two fresh-water biologists on the staff of the Fisheries Laboratory have continued their investigations along the lines described in the annual report for last year. A second report by Mr. D. F. Hobbs, which is in the press as Fisheries Bulletin No. 8 at the time of writing and will probably be issued before this report is printed, is on "Natural Reproduction of Trout in New Zealand and its Relation to Density of Population," and gives the results of a continuation of the research which was the subject of the paper published in 1937 as Fisheries Bulletin No. 6. It describes observations on the natural reproduction of brown and rainbow trout in 64 streams belonging to 10 river systems in Southland and in the North Island. From a study of losses up to successive points of development among the ova or alevins (trout larvæ) in samples from 542 redds, estimates have been made of approximate mortality of embryos until hatching and of larval fish until their emergence from the shingle or gravel of the stream-bed as fry. It was ascertained that, as observed in the river systems previously studied in Canterbury and Westland, the losses were generally low. Percentage losses of ova ascertained from 9 river systems were 3.2, 4.6, 5.5, 6.1, 6.8, 9.4, 11.4, 12.9, and 29.3. Larval mortalities were found to be very low, the dead recovered amounting to 0.27 per cent. of 141,935 specimens. Additional losses, not measured, may have occurred through the removal of ova and larval fish from redds either by flood action or by later spawners. The depth at which eggs are buried, the stability of areas selected for oviposition, and observations on sample series of redds indicate that most eggs are safeguarded from the effects of normal floods.

The conditions trout require for spawning are very special and, rather than spawn in unsuitable places, late spawners will use sites previously used by earlier fish. In congested spawning areas losses result from the precipitation of silt in old redds, the diversion of current from them, and from the dislodgment of older eggs as more fish spawn.

In the later part of his paper Mr. Hobbs discusses the factors capable of controlling the density of a population of fish or other animals. He shows that trout in New Zealand have become established where satisfactory facilities for reproduction exist. Since, whether artificial stocking is still regularly carried on or not, stocks in all the streams examined have increased to a stage where the numerical abundance of mature fish is such that all available spawning-grounds are so intensively used that a proportion of redds are superimposed on earlier ones, with attendant loss, it is inferred that introductions of trout have been successful largely according to the extent to which facilities for reproduction exist. It is pointed out that cases were not found where growth of population had been arrested before losses by superimposition commence. The inference is made that this is an indication that

* In the Rotorua and Taupo districts the functions of an acclimatization society are exercised, under the authority of the Animals Protection and Game Act, by the Department of Internal Affairs, which also has special powers and duties in connection with the waters and fisheries of those districts under statutes passed with regard to Native lands.

other factors alone are not usually competent to arrest increase of population earlier. The general conclusion is reached that populations of trout in New Zealand waters commonly produce more eggs than are necessary to effect the maintenance of the stock at the same numerical strength and destroy by superimposition of spawning-redds the excess over what are required for such maintenance.

It follows that, where this is so, reduction (within limits) of a population increases the average efficiency of reproductive units. Conversely, increase of population by means other than artificial extension of spawning-areas will decrease the average efficiency of spawning. It also follows, as a point of importance in connection with practical policies, that attention should be given to the protection of stream-beds capable of providing spawning-places for trout from the effects of pollution and from deterioration caused by other preventable agencies. Those in control of trout waters, many of which are good in every respect save for deficiency of spawning-ground, might also very well make tentative efforts towards the artificial provision of stream-bed suitable for the nesting operations of trout. Study of fisheries bulletins should give one a sufficient understanding of fundamental principles to afford a basis for at least some promising experiments.

Mr. K. R. Allen's work has been devoted to the investigation of a trout population from another important aspect, and during the past year he has made good progress with the programme outlined in last year's report. This has as its object an attempt to gather information concerning the relationship between the food-supply in a stream and the quantity of trout which it supports. For this purpose it was necessary to concentrate the work on some small stream with a good stock of trout situated reasonably close to the laboratory in Wellington. The Horokiwi Stream flowing into Porirua Harbour has been selected as suitable in most respects for the work planned.

In order to determine the quantity of food present in the stream it is necessary to measure the area of each type of water (pool, rapid, &c.) and to find out the average number of each of the principal animals per square foot in each of them. In this way the total number of each animal in this whole stream can be estimated approximately. The greater part of that portion of the system which carries trout has been surveyed during the year; this comprises approximately 8 miles of stream covering over 10½ acres. Quantitative collections of the fauna are also being made in various parts of the stream at regular intervals throughout the year. It appears that the average number of animals to the square foot is approximately 290, and thus there are very roughly 14,000,000 animals in the part of the stream so far surveyed. A proportion of these animals (possibly about 10 per cent.) belong to types which are rarely or never eaten by trout.

It is also necessary for the purpose of this work to know the life-history of the typical fish of the Horokiwi and find out what quantity and kind of food they eat at different stages of their life and to what extent they move about the stream or out to the sea. In order to do this the fish which hatched in the spring of the past year are being followed throughout their life. It has been found that in this stream the fish grow remarkably fast during their first year, and at the end of March, when five months old, are about 5 in. in length. The food of the trout in the Horokiwi shows very little change during the first year, and is composed very largely of mayfly nymphs of the genera *Deleatidium* and *Atalophlebia*; these together usually make up 80 per cent. to 90 per cent. of the food. In addition to these principal lines of investigation, data are also being obtained concerning the spawning habits of the trout in the Horokiwi, and the number and size of fish caught by anglers there. A start has also been made with a programme of tagging trout in order to obtain further information concerning the migration and rate of growth of the fish.

In January, 1940, a visit was made by Mr. Allen to the Waiau River system in Southland in order to observe the Atlantic salmon there and obtain data concerning the distribution of the immature stages of these fish. It was found that at the time of the visit salmon in their first year were abundant in the lower part of the Upukerora River and occurred in smaller numbers in the upper part of this and the Eglinton River. Second-year salmon were also found in small numbers in the upper parts of the river.

At the request of local acclimatization societies Mr. Hobbs made an examination of waters in the Palmerston North - Marton area, of the Wellington District, and in portions of the Waimarino District. A brief survey of streams in the Tongariro National Park was made for the Tourist Department. The North Canterbury, Waitaki, Otago, and South acclimatization districts were also visited.

Sea Fisheries.

The Marine Biologist, Mr. A. M. Rapson, has completed a report which is now in the press, for publication as Fisheries Bulletin No. 7, on "The Growth, Reproduction, and Distribution of the Lemon Sole in Tasman Bay and Marlborough Sounds." This is based on observations made and material collected from fishing-boats in recent years which constitute a portion of the whole data collected with regard to the distribution and spawning of the flat fish of these areas. Mr. Rapson used a tow-net of 3 ft. diameter, with a hinged ring of his own design for its mouth, for the collection of planktonic eggs. The eggs and larvae of the lemon sole have been described as to their specific characters, the stages of larval development have been worked out, and the location of spawning-grounds has been determined. Measurements of lemon soles in commercial catches were made, and from consideration of length-frequencies the local character of stocks and their movements throughout the year were elucidated. An estimate of growth-rate has been made from the examination of otoliths (ear-bones), which shows that the species first appears in commercial hauls at the age of two years when males have reached an average length of 23 cm. (9 in.) and females 25 cm. (9.8 in.). At this age these fish become mature. By the analysis of length-frequency data from commercial catches in Danish-seine vessels it was found that the percentage of fish under 23 cm. in length decreased from 6.1 to 1.3 after the minimum legal size of the mesh of the cod end of the net had been increased from 4½ in. to 5 in.

Blue cod investigations in the French Pass district have been continued and have been mainly concerned with the study of growth-rate. Otoliths have been collected and examined, and fish-tagging experiments have been commenced to provide data for a check on results obtained from otolith examinations and to throw light on questions of blue cod migration. A preliminary study of the pilchard ("Picton herring") stocks of Marlborough Sound is proceeding by examination of samples obtained periodically. Records of length frequencies, vertebrae counts (for racial characters), sexual condition, food, and oil content have been kept. Mr. Rapson has worked at sea during the year on a Wellington steam-trawler and on an Auckland Danish-seiner. From these trips he has brought back useful information regarding the tarakihi and has made further identifications of pelagic fish-eggs.

Preliminary surveys of the existing but mostly exiguous oyster-beds in the Cook Strait region have been made, such work being an essential prerequisite to any developmental policy. Work has also been done periodically on the toheroa-beds of the Ninety-mile, North Kaipara, and Muriwai beaches, and further data on growth and density of distribution have been obtained.

In connection with all sea-fishery work the Marine Biologist has taken full advantage of the facilities obligingly placed at his disposal by skippers and principals of commercial firms, and for which our appreciation should be expressed. Very little progress in research could have been made without the collaboration so readily given. There are, however, definite limitations to what can be done as a passenger on a working fishing-boat. Unfortunately, our plans for extending research work at sea by making use of the newly commissioned "Ikateru" have had to be held in abeyance because she, like an increasing number of other agencies available for national service, is otherwise engaged.

THE CENTENNIAL EXHIBITION.

The Fisheries Branch was responsible for a small pavilion in the Government Court of the Centennial Exhibition that was open from 8th November, 1939, to 4th May, 1940. Planned long before outbreak of war, which had such a disastrous effect on the attendance of visitors that would normally have been expected, the exhibit was designed mainly with the idea of showing the character of our principal commercial fishes and the methods by which they are chiefly caught; also to exemplify our resources in sporting fishes, both marine and fresh-water, and to indicate the nature of the unique species of fresh-water fish that are native to New Zealand. The marine fishes were exemplified by casts in natural colours. Models of an Auckland steam-trawler, an Auckland Danish-seiner, and a Cook Strait long-lining boat, each with its appropriate gear, were also shown. By way of contrast with the modern methods, specimens of Maori fishing-gear, kindly loaned by the Dominion Museum, were exhibited. We were also indebted to the same institution for the loan of some of the casts of sea-fish displayed. Acclimatized fish of sporting interest were represented by mounted specimens of brown, rainbow, and speckled (American brook) trout and quinnat salmon, all of which had been caught in 1939. Trout and salmon caught during the current season were shown in a refrigerated display case, and were renewed by replacements from time to time, but in the absence of overseas visitors and for the sake of saving expense these specimens were not renewed as frequently as would have been the case if the times had been normal. Living specimens of native species such as *inanga* (adult whitebait), (*Galaxias attenuatus*), kokopu (*Galaxias fasciatus*), koaro (*Galaxias koaro*), New Zealand gudgeon (*Galaxias brevipinnis*), bulley (*Gobiomorphus gobioides*), smelt (*Retropinna retropinna*), eels (*Anguilla dieffenbachii* and *Anguilla australis*), lamprey (*Geotria australis*), and fresh-water crayfish (*Paranephrops* sp.), together with such representatives of acclimatized fish as brown, rainbow, and speckled (American brook) trout, young quinnat salmon, perch, and tench, were displayed in six aquarium tanks. A working hatchery box from the Hakataramea Hatchery was shown in which for part of the time a number of rainbow-trout ova, sent from the Tokaanu Hatchery of the Internal Affairs Department, could be seen in the embryo and alevin stages. Preserved specimens showing successive stages of brown-trout ova and alevins, in a series of increasing age, were also exhibited. During the later stages of the exhibition a display of edible sea-weeds, collected and prepared by Miss L. M. Cranwell, of the Auckland Museum, and Miss L. B. Moore, of the Plant Research Bureau, was on view. In another case were shown specimens of the two species of marine crayfish (*Jaanus lalandii* and *Jaanus hugelii*).

A. E. HEFFORD,

Chief Inspector of Fisheries, and Director of Fisheries Research.

TABLE SHOWING THE NUMBER OF SEAMEN ENGAGED AND DISCHARGED IN NEW ZEALAND, AND THE FEES RECEIVED, FOR THE YEAR ENDED 31ST MARCH, 1940.

Port.	Engagements and Discharges, Foreign and Intercolonial Trade.				Engagements and Discharges, Home Trade.				Total Engagements.		Total Discharges.		Grand Totals.	
	Engagements.		Discharges.		Engagements.		Discharges.		Number.	Amount.	Number.	Amount.	Number.	Amount.
	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.						
Auckland	1,601	£ s. d. 156 2 0	1,812	£ s. d. 177 18 0	1,629	£ s. d. 145 13 0	1,581	£ s. d. 142 9 0	3,230	£ s. d. 301 15 0	3,393	£ s. d. 320 7 0	6,623	£ s. d. 622 2 0
Dunedin	422	41 16 0	400	39 12 0	100	9 7 0	98	9 3 0	522	51 3 0	498	48 15 0	1,020	99 18 0
Foxton	3	0 6 0	..	..	14	1 8 0	18	1 16 0	14	1 8 0	18	1 16 0	32	3 4 0
Gisborne	37	3 14 0	..	..	32	2 15 0	36	3 3 0	35	3 1 0	36	3 3 0	71	6 4 0
Greymouth	..	..	..	4 4 0	62	4 16 0	33	2 14 0	99	8 10 0	75	6 18 0	174	15 8 0
Hokitika	..	..	..	..	17	0 17 0	16	0 15 0	17	0 17 0	16	0 15 0	33	1 12 0
Invercargill	20	2 0 0	53	5 6 0	56	4 3 0	56	5 8 0	76	6 3 0	109	10 14 0	185	16 17 0
Lyttelton	236	23 4 0	231	21 17 0	193	16 3 0	192	17 11 0	429	39 7 0	423	39 8 0	852	78 15 0
Napier	31	3 2 0	21	2 2 0	263	24 6 0	254	25 11 0	294	27 8 0	275	27 13 0	569	55 1 0
Nelson	..	..	..	..	448	33 18 0	502	36 12 0	448	33 18 0	502	36 12 0	950	70 10 0
New Plymouth	15	1 10 0	23	2 6 0	18	1 10 0	8	0 16 0	33	3 0 0	31	3 2 0	64	6 2 0
Oamaru	2	0 4 0	3	0 6 0	..	..	1	0 2 0	2	0 4 0	4	0 8 0	6	0 12 0
Onechunga	..	..	..	..	95	8 5 0	103	8 16 0	95	8 5 0	103	8 16 0	198	17 1 0
Patea ..	..	..	..	..	50	2 11 0	49	2 11 0	50	2 11 0	49	2 11 0	99	5 2 0
Pictou..	3	0 6 0	1	0 2 0	10	1 0 0	6	0 12 0	13	1 6 0	7	0 14 0	20	2 0 0
Tauranga	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Te Kopuru	2	0 4 0	1	0 2 0	..	..	..	..	2	0 4 0	1	0 2 0	3	0 6 0
Timaru	11	1 2 0	2	0 4 0	48	4 10 0	45	4 4 0	59	5 12 0	47	4 8 0	106	10 0 0
Wairau	..	..	..	..	9	0 6 0	1	0 2 0	9	0 6 0	1	0 2 0	10	0 8 0
Wanganui	18	1 16 0	83	8 6 0	87	7 0 0	96	7 17 0	105	8 16 0	179	16 3 0	284	24 19 0
Wellington	3,124	292 19 0	3,043	283 19 0	2,318	195 11 0	2,163	183 14 0	5,442	488 10 0	5,206	467 13 0	10,648	956 3 0
Westport	41	4 2 0	40	3 16 0	55	4 16 0	55	4 16 0	96	8 18 0	95	8 12 0	191	17 10 0
Totals..	5,566	532 7 0	5,755	550 0 0	5,504	468 15 0	5,313	458 12 0	11,070	1,001 2 0	11,068	1,008 12 0	22,138	2,009 14 0

RETURN OF ESTATES OF DECEASED SEAMEN RECEIVED AND ADMINISTERED IN PURSUANCE OF THE PROVISIONS OF THE SHIPPING AND SEAMEN ACT, 1908, DURING THE YEAR ENDED 31ST MARCH, 1940.

Name of Seaman.	Balance to Credit of Estate on 1st April, 1939.	Amount received.	Amount paid.	Balance to Credit of Estate on 31st March, 1940.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
W. D. Beattie .. .. .	..	68 15 0	68 15 0	..
G. Brookland .. .. .	..	50 6 3	50 6 3	..
M. Edminstin .. .. .	..	3 3 9	3 3 9	..
E. H. Faulkner .. .. .	..	18 8 11	18 8 11	..
W. Gullion	0 17 6	35 14 9	36 12 3	..
J. Hare .. .. .	..	9 14 4	..	9 14 4
R. E. Hollis .. .. .	..	75 8 11	65 12 6	9 16 5
J. Kiffenbank .. .. .	..	5 2 5	..	5 2 5
H. A. Scollay	5 2 2	5 7 9	..	10 9 11
J. Smith .. .. .	..	15 3 11	15 3 11	..
A. J. Webb .. .. .	..	57 9 4	57 9 4	..
J. Wright	4 3 7	0 8 9	4 12 4	..
	10 3 3	345 4 1	320 4 3	35 3 1

RETURN SHOWING AMOUNTS RECEIVED PRIOR TO 1ST APRIL, 1939, STANDING TO CREDIT OF ESTATES OF DECEASED SEAMEN AND FOR WHICH CLAIMS HAVE NOT BEEN PROVED.

Name of Seaman.	Balance to Credit of Estate, 31st March, 1940.
	£ s. d.
G. Banks, late seaman, s.s. "Marama" .. .. .	.. 6 16 6
J. Payne, trimmer, s.s. "Omana" .. .. .	.. 14 19 8
	<u>£21 16 2</u>

SUMMARY OF EXAMINATIONS FOR CERTIFICATES OF COMPETENCY AS MARINE ENGINEER FOR THE YEAR ENDED 31ST MARCH, 1940.

Class of Certificate.	Auckland.			Wellington.			Christchurch.			Dunedin.			Other Centres.			Totals.		
	Passed.	Failed.	Total.	Passed.	Failed.	Total.	Passed.	Failed.	Total.	Passed.	Failed.	Total.	Passed.	Failed.	Total.	Passed.	Failed.	Total.
IMPERIAL VALIDITY.																		
First and second class (steam) ..	8	4	12	3	10	13	8	2	10	..	..	..	..	..	..	19	16	35
First and second class (motor) ..	5	3	8	7	5	12	..	..	..	..	1	1	..	..	..	12	9	21
First class steam endorsement ..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
First class motor endorsement ..	..	..	..	2	1	3	1	..	1	..	..	..	..	..	..	3	1	4
Totals	14	7	21	12	16	28	9	2	11	..	1	1	..	..	..	35	26	61
VALID IN NEW ZEALAND ONLY.																		
Third class (steam)	7	2	9	15	2	17	5	6	11	9	2	11	..	..	..	36	12	48
River engineer (steam)	5	1	6	..	..	..	..	..	..	..	..	..	1	..	1	6	1	7
First and second class (coastal, motor)	6	4	10	4	..	4	..	..	..	2	1	3	..	..	..	12	5	17
Restricted-limits engineer, P.V.O.S. ..	14	4	18	1	..	1	7	1	8	2	..	2	18	2	20	42	7	49
Totals	32	11	43	20	2	22	12	7	19	13	3	16	19	2	21	96	25	121
Grand totals	46	18	64	32	18	50	21	9	30	13	4	17	19	2	21	131	51	182

RETURN OF THE NUMBER OF CERTIFICATES ISSUED TO LAND-ENGINE DRIVERS AND ELECTRIC-TRAM DRIVERS DURING THE YEAR ENDED 31ST MARCH, 1940.

Class.				No.	Class.				No.
Service—					Competency— <i>continued.</i>				
First-class engine-driver				1	Locomotive-engine driver				9
Competency—					Traction-engine driver				13
First-class engine-driver				42	Electric-tram driver				121
Second-class engine-driver				220	Electric-tram driver (one-man car) ..				6
Steam winding-engine driver				8					
Electric winding-engine driver				7	Total				472
Locomotive and traction engine driver ..				45					

RETURN OF LAND ENGINEERS', ENGINE-DRIVERS', AND ELECTRIC-TRAM DRIVERS' EXAMINATIONS HELD THROUGHOUT NEW ZEALAND DURING THE YEAR ENDED 31ST MARCH, 1940, SHOWING THE NUMBER OF SUCCESSFUL AND UNSUCCESSFUL CANDIDATES.

Place.	Extra First Class.		First Class.		Second Class.		Locomotive and Traction.		Locomotive.		Traction.		Winding.				Electric-tram Driver.		Total.		Grand Total.
													Steam.		Electric.						
	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	P.	F.	
Auckland	9	3	28	5	2	..	2	..	1	1	1	..	..	..	50	4	93	13	106
Christchurch	3	4	24	2	2	..	..	..	2	..	..	..	..	..	9	..	40	6	46
Dunedin	2	1	10	14	1	..	2	..	..	..	..	..	..	..	1	..	16	15	31
Gisborne	1	2	1	..	..	..	..	..	..	..	..	..	..	..	..	2	1	3
Greymouth	5	3	8	11	3	1	3	1	..	..	1	..	2	..	..	..	22	16	38
Hamilton	2	..	23	10	1	1	..	..	..	..	2	..	3	..	..	..	31	11	42
Invercargill	4	2	25	7	1	..	..	..	4	..	..	..	..	..	1	..	35	9	44
Kopuawhara	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Napier	3	..	6	2	..	..	..	..	..	..	..	..	..	..	..	..	9	2	11
Nelson	2	..	4	1	..	..	..	..	..	..	..	..	..	..	..	..	6	1	7
New Plymouth	2	3	39	21	..	..	..	..	1	..	..	..	..	..	2	..	44	24	68
Palmerston N.	1	1	7	1	..	..	1	..	..	..	..	..	..	..	..	..	9	2	11
Timaru	1	1	..	..	..	..	2	..	..	..	..	..	..	..	3	1	4
Wanganui	6	1	1	..	1	..	..	..	..	..	..	..	3	..	11	1	12
Wellington	1	4	12	4	..	..	..	..	..	..	..	..	..	..	61	4	74	13	87
Whangarei	1	4	2	1	..	..	2	..	..	..	..	..	..	..	..	5	5	10
Totals	35	23	199	83	12	2	9	3	10	1	4	..	5	..	127	8	401	120	521

**SUMMARY OF CASUALTIES TO SHIPPING REPORTED TO THE MARINE DEPARTMENT DURING THE
FINANCIAL YEAR ENDED 31ST MARCH, 1940.**

Nature of Casualty.	On or near the Coasts of Dominion.			Outside the 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	2	7,554	..	..	..	..	2	7,554	..
Damaged	13	4,213	..	1	247	..	14	4,460	..
Undamaged	7	812	..	..	..	..	7	812	..
Total strandings	22	12,579	..	1	247	..	23	12,826	..
Fires—									
Total loss .. .. .	..	..	..	..	..	..	..	..	..
Damaged	3	227	..	..	..	..	3	227	..
Undamaged .. .. .	..	..	..	..	..	..	..	..	..
Total fires	3	227	..	..	..	..	3	227	..
Collisions—									
Total loss .. .. .	..	..	..	..	..	..	..	..	..
Damaged	14	3,478	..	..	..	..	14	3,478	..
Undamaged	4	16,094	..	..	..	..	4	16,094	..
Total collisions	18	19,572	..	..	..	..	18	19,572	..
Miscellaneous, including damage by heavy seas to hull and cargo, breakdown of machinery, &c.	30	31,676	..	9	36,430	..	39	68,106	..
Total number of casualties reported	73	64,054	..	10	36,677	..	83	100,731	..

**SUMMARY OF EXAMINATIONS FOR CERTIFICATES OF COMPETENCY AS MASTERS AND MATES
FOR THE YEAR ENDED 31ST MARCH, 1940.**

Class of Certificate.	Auckland.				Wellington.				Totals.				Total Examinations.
	Final Pass.	Partial Pass.	Failed.	Partial Failure.	Final Pass.	Partial Pass.	Failed.	Partial Failure.	Final Pass.	Partial Pass.	Failed.	Partial Failure.	
Foreign masters and mates ..	26	18	2	7	3	2	2	..	29	20	4	7	60
Home-trade, masters and mates ..	13	4	4	1	2	..	..	..	15	4	4	1	24
Master, river (steam) ..	4	..	1	..	3	..	..	..	7	..	1	..	8
Yacht-master, New Zealand waters	23	24	8	..	1	..	..	..	24	24	8	..	56
Compass syllabus ..	1	..	..	..	..	..	..	..	1	..	..	..	1
Fore-and-aft endorsement ..	2	..	..	..	..	..	..	..	2	..	..	..	2
Square-rigged sail endorsement ..	1	..	..	..	..	..	..	..	1	..	..	..	1
Sub-Lieutenant, R.N.V.R. ..	7	..	..	..	10	..	2	..	17	..	2	..	19
Totals	77	46	15	8	19	2	4	..	96	48	19	8	171

[illegible]

* Part-time vessels may appear in more than one place.

† Fish-carrier "South Sea." Vessel does not now trawl, but engages in line-fishing.

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 MARCH, 1940.

Name of Port.	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.											
Awanui and district	K, A, Q, Y	Cwt. 1,496	£ 1,037	Sacks.	£	Sacks.	£	Cwt.	£	£	£
Mangonui	A, Y, C	169	203	..	..	..	..	..	..	..	1,037
Whangaroa	A, C, K, B	1,416	1,347	..	..	..	..	128	110	110	203
Russell	A, K, E, C	1,427	1,580	..	..	..	..	8	12	12	1,457
Whangarei	A, K, C, E, Q	1,086	1,845	..	..	..	..	9	14	14	1,592
Auckland	A, B, E, H, C, P, K	138,249	135,502	5,930	8,154	10,602	3,821	1,006	1,610	13,585	149,087
Coromandel	K, E, A	24	38	..	..	..	..	171	290	290	328
Thames	A, E, H, R, I	19,399	24,501	..	..	6,029	1,930	..	..	1,930	26,431
Mercury Bay	A, C, K, V, E	866	836	..	..	..	..	657	1,088	1,088	1,924
Tauranga and district	A, B, C, K, Q	5,237	5,200	..	..	..	..	166	316	316	5,516
Whakatane	A, B, H, C, E	1,904	1,945	..	..	..	..	40	71	71	2,016
Opotiki	A, E	181	263	..	..	..	..	39	100	100	363
Gisborne	B, C, H, F	6,358	7,609	..	..	..	..	376	495	495	8,104
Waikokopu	A, S, D, E	70	138	..	..	..	..	79	132	132	270
Wairoa	A, H, E, K	5	10	..	..	..	..	1	2	2	12
Napier	C, H, B, A, F	13,745	20,217	..	..	..	..	707	1,286	1,286	21,503
Castlepoint	C, T	110	230	..	..	..	..	..	..	..	230
Wellington	B, D, C, M, L, G	48,000†	50,340	..	..	..	..	1,685	2,919	2,919	53,259
Makara	S, A, O, Q, C	604	938	..	..	..	..	95	165	165	1,103
Paremata	C, O, S, M	1,261	2,443	..	..	..	..	17	33	33	2,476
Paraparaumu Beach	A, O, C, S	785	1,165	..	..	..	..	..	..	..	1,165
Manawatu Heads	H, A, Y	382	750	..	..	..	..	..	..	..	750
Tangimoana	A, E, Y	84	146	..	..	..	..	..	..	..	146
Wanganui	A, C, H	328	482	..	..	..	..	..	..	..	482
New Plymouth	A, C, Y	555	896	..	..	..	..	18	33	33	929
Kawhia	E, A	266	524	..	..	..	..	..	..	..	524
Raglan	E, A	116	319	..	..	..	..	..	..	..	319
Manukau Harbour	K, E, A, R, Q	2,315	2,973	..	..	..	..	42	86	86	3,059
Kaipara	E, A, K	3,249	6,126	..	..	..	..	..	..	..	6,126
Hokianga	K, E, A	599	460	..	..	..	..	..	..	..	460
South Island.											
Havelock	E, D, C	325	1,262	..	..	..	..	..	..	..	1,262
Pictou	C, D, S	2,968	5,825	..	..	..	..	83	117	117	5,942
Blenheim (Wairau)	B, F, G	768	1,270	..	..	..	..	29	41	41	1,311
Kaikoura	C, G, T, S	2,908	5,385	..	..	..	..	295	505	505	6,390
Lyttelton	B, G, J, C, M,	10,542	17,513	..	..	..	..	101	100	100	17,613
Akaroa	B, J, G, C, H, E	3,578	6,096	..	..	..	..	338	450	450	6,546
Lake Ellesmere	E, W	2,401	6,481	..	..	..	..	..	..	..	6,481
Timaru	G, C, H, E, J, I	14,967	24,957	..	..	..	..	..	..	..	24,957
Oamaru	C, D, G, M	1,647	2,743	..	..	..	..	..	..	..	2,743
Moeraki	C, D, G, I	1,916	3,121	..	..	..	..	807	510	510	3,631
Karitane	G, D, C	431	660	..	..	..	..	958	587	587	1,247
Port Chalmers	F, I, N, C, G, E	11,512	17,808	..	..	..	..	1	1	1	17,809
Taieri Mouth	F, C, D	2,383	5,712	..	..	..	..	2	1	1	5,713
Nuggets	F, C, M	2,092	3,801	..	..	..	..	..	..	..	3,801
Waikawa	F, D, C, J, G	3,771	6,061	..	..	..	..	..	..	..	6,061
Invercargill	E, W, D, I	110	98	..	..	..	..	..	..	..	98
Bluff	D, C, E, T	2,703	4,574	75,145	54,480	..	..	..	..	54,480	59,054
Stewart Island	D, C, T, S	9,845	14,808	..	..	..	..	51	31	31	14,839
Riverton district	D, E, C	515	909	..	..	..	..	..	..	..	909
Hokitika	C, W	27	58	..	..	..	..	..	..	..	58
Greymouth	F, H, C	1,354	2,185	..	..	..	..	..	..	..	2,185
Westport	C, A, Y	508	1,115	..	..	..	..	100	118	118	1,233
Golden Bay	A, D	125	254	..	..	..	..	2	4	4	258
Motueka	A, C, D, E	429	454	..	..	..	..	3	4	4	458
Nelson	A, C, H, E	3,891	5,608	..	..	..	..	57	89	89	5,697
French Pass	D, C, A, S	2,556	4,438	..	..	..	..	..	..	..	4,438
Chatham Islands	D, C	4,673‡	2,721	..	..	..	..	..	..	..	2,721
Totals		339,231	416,480	81,075	62,634	16,631	5,751	8,071	11,320	79,705	496,185

* Not including whitebait.

† Total includes 9,565 cwt. blue cod and 71 cwt. groper caught at the Chatham Islands and landed at Wellington.

‡ Exclusive of fish shipped direct to Wellington from fishing-boats by s.s. "South Sea."

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 = Pike.
S = Butterfish.

T = Trumpeter.
U = Whiting.
V = Kingfish.
W = Herring.
Y = Kahawai.
Z = Conger-eel.

TABLE II.A.—SHOWING APPROXIMATELY THE QUANTITIES OF DIFFERENT KINDS OF FISH LANDED AT CERTAIN PORTS DURING THE YEAR ENDED 31st MARCH, 1940.

	Russell.	Kaipara.	Whangarei.	Auckland.	Thames.	Mercury Bay.	Tauranga and District.	Gisborne.	Napier.	New Plymouth.	Wellington.	Mt. Albion (Wairau).	French Pass.	Nelson.	Westport.	Greymouth.	Kaitiaki.	Akaroa.	Lyttelton.	Waimu.	Oamaru.	Moeraki.	Port Chalmers.	Bluff.	Invercargill.	Riverton District.	Chatham Islands.
Barracouta	Cwt.																										
Blue cod	1			13		5	5		3	1	1,603	24	1,236	76			9	1	276	46	3	528	1,658	2,263	7	293	4,509
"Bonita" (Brama)											23						17					16					
Brill											296	29	112	4			95	6		2		6					
Butterfish (greenbone)									3													1					
Conger-eel							1				41		18														
Elephant-fish											34											48					
Flounder	77	1,715	35	6,271	3,218	16	23	7	310	1	25	51		152	4	33		89	831	1,932		769	132	62	12		
Frost-fish											7																
Garfish				50																		4					
Gurnard		4	4	1,563	702	2	51	511	2,297	1	259	5	19	321	3	173		172	397	2,176		58				3	
Hake											2,370		1				16	62	709	47	25	8	43				
Hapuku (gropo)	59		77	1,574		173	278	1,195	2,855	75	8,109	9	670	338	328	111	1,575	321	791	2,452	1,424	1,259	1,343	281	1	75	164
Herring	1										92											2			36		
John-dory				780			1							16			6						1				
Kahawai		2		3			3		1	5	20			3	10		1			3			1				
Kingfish			1	247		17			2		7	92	8		7	16	957	630	1,618	2,741	38	53	777			2	
Ling				5							28	4															
Mackerel						2																					
Maomao	5																										
Moki											1,619	29	17				43	23	205	1	22	1					
Mullet	362	496	103	715	23	30	66																				
Parore											23																
Pike	1			66	131						862	19					2						119				
Red cod					45		55	115	4														2,142		4	1	
Sardine											192																
Skate											40																
Snapper	858	932	827	100,764	14,153	593	4,213			462				2,705	36	9		3	1	12			3				
Sole									1,284		680	9	342	2				5	23	2							
Tarakihi			1	20,981		5	430	2,071	1,947		15	93		48	7	728	2	48	199	1,076		1	3,293			98	
Trevally									2,050		18,593	107	13	2	8	21	3	1,021	3,562	84		5	89				
Trumpeter		2	18	279	2		65		6		250																
Turbot											17						93						2				
Warehou																											
Whiprail				1							168	3															
Whiting											29																
Mixed flat fish											253																
Mixed round fish and kinds not specified	32			1,678	1,113			358	747		6	132		187	94	114			13	147			543			31	
	11	98	20	3,259	2	23	34	2,080	2,438	10	1,721	162	97	38	6	103	35	294	334	1,422	3	18	315	23			
Totals	1,427	3,249	1,086	138,249	19,399	866	5,237	6,358	13,745	555	48,040*	768	2,556	3,891	508	1,354	2,968	3,578	10,542	14,967	1,647	1,916	11,512	2,703	110	515	4,673†

* Total includes 9,565 cwt. blue cod and 71 cwt. gropo landed at Wellington by fish-carrier "South Sea" from Chatham Islands.

† Exclusive of fish shipped direct to Wellington from fishing-boats by s.s. "South Sea."

TABLE IIb.—SHOWING THE QUANTITIES OF DIFFERENT KINDS OF FISH* CAUGHT BY THE DIFFERENT METHODS OF FISHING FOR THE YEAR ENDED 31ST MARCH, 1940.

	Trawl.			Danish-seine.			Other Nets.				Lines.				Grand Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Steam.		Motor.	Total.	Motor.		Row-boat.	Total.	Motor.		Row-boat.	Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Cwt.	£			Cwt.	£			Cwt.	£			Cwt.	£																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
Barracouta	1,777	1,032	36	33	1,813	1,065	..	5	..	6	..	2	..	5

* Not including whitebait.

TABLE IIc.—SHOWING THE TOTAL QUANTITIES OF WET FISH LANDED AT EACH OF THE CHIEF FISHING PORTS IN EACH MONTH OF THE YEAR 1939-40.

Port.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	Totals.
<i>North Island.</i>	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Awamui and district	78	139	73	98	102	98	122	141	157	165	163	160	1,496
Mangonui	5	18	16	2	6	3	13	29	17	23	18	18	169
Whangaroa	73	108	132	82	72	93	229	181	152	92	54	147	1,416
Russell	75	132	142	115	109	148	173	97	109	87	117	118	1,427
Whangarei	75	63	88	85	116	94	135	92	116	58	114	46	1,086
Auckland	10,925	12,523	12,410	13,106	19,136	14,234	14,123	11,152	8,528	7,034	8,430	6,648	138,249
Coromandel	3	2	3	1	3	4	3	3	1	..	1	..	24
Thames	1,184	1,533	1,699	1,273	2,462	2,388	1,931	1,319	722	1,057	2,444	1,387	19,399
Mercury Bay	108	86	66	53	49	61	79	85	69	60	41	109	866
Tauranga and district	363	337	252	462	388	315	676	436	436	306	696	570	5,237
Whakatane	142	209	137	187	98	188	191	180	152	83	121	213	1,904
Opotiki	10	25	24	9	6	28	28	19	24	5	..	3	181
Gisborne	409	457	692	379	745	766	643	678	548	481	346	214	6,358
Waikokopu .. ..	..	..	..	..	..	..	4	22	12	12	10	10	70
Wairoa .. ..	..	2	..	..	..	..	1	2	..	..	..	..	5
Napier	1,096	796	1,629	949	1,429	1,296	1,452	1,231	1,078	731	1,212	846	12,745
Castlepoint .. ..	..	..	..	..	..	11	29	39	25	6	..	..	110
Wellington	2,715	2,920	2,309	2,244	2,869	2,644	3,838	2,927	3,819	2,889	3,716	4,484	*38,364
Makara	50	81	5	68	37	42	22	104	12	59	33	81	604
Paremata	92	90	91	129	38	136	134	166	59	103	59	163	1,261
Paraparaumu Beach	78	78	81	81	34	22	74	85	83	49	40	80	785
Manawatu Heads	79	71	17	15	7	15	38	42	29	28	13	28	382
Tangimoana	18	12	3	1	1	7	8	11	13	4	..	6	84
Wanganui	121	62	60	17	3	6	5	2	2	19	3	28	328
New Plymouth	122	86	37	34	32	15	32	31	91	52	1	22	555
Kawhia	40	40	14	9	13	23	27	18	16	44	6	16	266
Raglan	10	3	2	2	16	18	17	20	13	5	4	6	116
Manukau Harbour	188	171	113	100	230	299	235	235	215	124	219	186	2,315
Kaipara	337	462	195	157	278	263	276	198	258	218	279	328	3,249
Hokianga	35	43	41	16	30	60	58	88	83	64	23	58	599
<i>South Island.</i>													
Havelock	26	69	58	66	39	24	13	9	7	..	..	14	325
Pictou	251	383	365	269	138	86	332	309	209	173	200	253	2,968
Blenheim (Wairau)	66	34	92	12	55	42	65	155	42	55	84	66	768
Kaikoura	175	230	515	123	87	162	302	439	377	207	161	130	2,908
Lyttelton	1,471	1,442	964	480	792	918	707	807	845	538	655	923	10,542
Akaroa	402	296	450	129	274	293	373	330	288	155	209	289	3,578
Lake Ellesmere	290	236	200	400	172	48	213	261	155	181	92	153	2,401
Timaru	2,085	1,783	1,246	339	526	1,012	1,176	1,600	938	1,320	1,251	1,691	11,967
Oamaru	240	164	69	9	19	89	72	55	202	267	212	249	1,647
Moeraki	382	279	91	59	50	145	177	118	54	191	162	208	1,916
Karitane	81	84	81	6	7	1	19	30	25	34	25	38	431
Port Chalmers	1,187	1,041	883	528	382	519	853	1,407	1,159	741	1,445	1,367	11,512
Taieri Mouth	174	282	117	15	19	265	347	305	231	191	205	232	2,383
Nuggets	210	295	129	30	36	222	210	261	304	167	95	109	2,092
Waikawa	111	95	58	72	59	396	620	547	781	610	210	212	3,771
Invercargill	5	1	..	..	1	7	38	14	20	2	3	19	110
Bluff	249	226	282	308	365	279	235	402	204	111	28	14	2,703
Stewart Island	2,323	1,197	948	897	1,161	819	641	514	109	6	471	859	9,845
Riverton district	70	33	27	33	79	23	78	82	34	42	8	6	515
Hokitika	12	7	..	..	..	..	1	1	3	1	1	1	27
Greymouth	173	135	87	140	115	26	107	186	112	88	20	165	1,354
Westport	68	84	150	89	48	24	1	7	28	6	3	..	508
Golden Bay	7	2	3	1	6	8	9	8	14	18	22	27	125
Motueka	35	97	39	35	33	21	19	35	25	26	22	42	429
Nelson	367	464	386	380	286	261	302	270	337	261	210	367	3,891
French Pass	135	641	365	333	157	114	203	164	78	60	128	178	2,556
Chatham Islands	1,822	784	1,526	1,084	2,320	1,562	748	790	..	173	1,590	1,910	14,309
Totals	30,848	30,933	29,463	25,511	35,529	30,644	32,396	29,739	23,420	19,483	25,768	25,497	339,231

* Exclusive of fish shipped to Wellington from the Chatham Islands.

TABLE III.—SHOWING THE NUMBER OF SACKS AND VALUE OF THE OYSTERS OBTAINED IN THE DOMINION DURING THE YEAR ENDED 31ST DECEMBER, 1939.

Locality.						Quantity.	Value
DREDGE OYSTERS.						Sacks.	£(N.Z.)
Foveaux Strait	..	..	..	..	..	75,145	54,480
ROCK OYSTERS.							
Bay of Islands	..	..	..	..	..	2,295	8,154
Whangarei Harbour	..	..	..	..	..	125	
Kaipara Harbour	..	..	..	..	..	827	
Hauraki Gulf*	..	..	..	..	..	1,927	
Coromandel ..	..	..	..	..	..	456	
Great Barrier Island	..	..	..	..	..	300	
Total	..	..	..	..	..	5,930	
Grand total	..	..	..	..	..	81,075	62,634

* Mahurangi, 146; Waiheke, 700; Crusee Island, 68; Brown's Island, 57; Motutapu, 14; Rangitoto, 171; Rakino, 35; Ponui, 539; Pakihi, 42; South Shore, 153.

TABLE IV.—SHOWING THE NUMBER AND SPECIES OF WHALES TAKEN OFF THE NEW ZEALAND COAST, WITH QUANTITY OF PRODUCTS, FOR THE YEAR ENDED 31ST MARCH, 1939.

Whaling-station.	Number of Whales taken.	Species.	Yield of Oil.	Quantity of Other Products.
			Tons.	Tons.
Marlborough Sounds (Picton) ..	80 1	Humpback .. Blue.. ..	450	21

TABLE V.—SHOWING THE TOTAL QUANTITY AND VALUE OF FISH AND SHELL-FISH IMPORTED INTO AND EXPORTED FROM NEW ZEALAND DURING THE YEAR ENDED 31ST MARCH, 1940.

Fish and Shell-fish imported.

Kind of Fish.	Quantity.	Value.
		£(N.Z.)
Anchovies, salted, in containers of 28 lb. or over	27 cwt.	155
Other fish—		
Frozen, smoked, pickled, dried, or salted	362 cwt.	1,414
Potted or preserved in tins	3,349,957 lb.	163,042
Total value	..	164,611

TABLE V.—SHOWING THE TOTAL QUANTITY AND VALUE OF FISH AND SHELL-FISH IMPORTED INTO AND EXPORTED FROM NEW ZEALAND DURING THE YEAR ENDED 31ST MARCH, 1940—*continued.*

Fish and Shell-fish exported.

Kind of Fish.	Exporting Ports.	Quantity.	Value.
<i>(a) Produce of New Zealand.</i>			£(N.Z.)
Oysters, fresh	Auckland	1,159 doz.	45
	Wellington	9,706 doz.	250
	Invercargill	53,345 doz.	701
	Total	64,210 doz.	996
Blue cod, frozen	Auckland	5 cwt.	21
	Wellington	4,557 cwt.	15,514
	Lyttelton	4 cwt.	10
	Dunedin	442 cwt.	1,432
	Invercargill	7,862 cwt.	25,168
	Total	12,870 cwt.	43,146
Snapper, frozen	Auckland	8,549 cwt.	28,066
	Wellington	132 cwt.	293
	Total	8,681 cwt.	28,359
Flounder, frozen	Auckland	2,572 cwt.	10,215
	Wellington	249 cwt.	962
	Lyttelton	437 cwt.	1,800
	Dunedin	377 cwt.	1,495
	Invercargill	151 cwt.	560
	Total	3,786 cwt.	15,032
Tarakihi, frozen	Auckland	4,712 cwt.	18,903
	Wellington	173 cwt.	429
	Lyttelton	9 cwt.	19
	Dunedin	84 cwt.	235
	Total	4,978 cwt.	19,586
Crayfish, frozen	Auckland	91 cwt.	324
	Wellington	9 cwt.	19
	Dunedin	193 cwt.	615
	Total	293 cwt.	968
Other kinds, frozen	Auckland	52 cwt.	266
	Wellington	1,869 cwt.	4,736
	Lyttelton	256 cwt.	478
	Dunedin	2,313 cwt.	6,044
	Gamaru	63 cwt.	160
	Invercargill	391 cwt.	1,224
	Total	4,944 cwt.	12,908
Total exports of frozen fish from New Zealand		22,682 cwt.	119,999
Smoked, dried, pickled, or salted		359 cwt.	1,249
Preserved in tins—			
Crayfish	Wellington	32 lb.	3
	Dunedin	4,567 lb.	405
	Total	4,599 lb.	408
Oysters	Auckland	3,018 lb.	190
	Wellington	16,155 lb.	823
	Dunedin	59,067 lb.	3,854
	Invercargill	222,520 lb.	10,883
	Total	291,760 lb.	15,750
Toheroa	Auckland	62,597 lb.	3,840
	Wellington	425 lb.	31
	Dunedin	180 lb.	16
	Total	63,202 lb.	3,887
Whitebait	Auckland	31,049 lb.	4,252
	Wellington	10,429 lb.	1,918
	Lyttelton	108 lb.	15
	Dunedin	8,397 lb.	1,408
	Total	49,983 lb.	7,593
Value of total exports of New Zealand fish and shell-fish			149,882
<i>(b) Re-exports.</i>			
Potted and preserved in tins		16,005 lb.	818

APPENDICES.

APPENDIX I.

LEGISLATION.

ORDERS IN COUNCIL UNDER PARTS I AND II OF THE FISHERIES ACT, 1908.

Part I.

5th April, 1939	..	Amending the Salt-water Fisheries Regulations for Danish seining in Bay of Plenty.
27th September, 1939	..	Altering the close season for taking toheroas.
18th October, 1939	..	Consolidating the Sea-fisheries Regulations 1939.
20th December, 1939	..	Amending the Sea-fisheries Regulations 1939 prescribing the minimum size at which fish may be taken.
13th March, 1940	..	Amending the Sea-fisheries Regulations 1939 with reference to netting-limits in the Waimakariri and Ashley Rivers.

Part II.

9th June, 1939	..	Amending regulations for trout-fishing in the Waitaki Acclimatization District.
5th July, 1939	..	Amending regulations for trout-fishing in the Nelson Acclimatization District.
16th August, 1939	..	Amending the Fresh-water Fisheries Regulations 1936.
23rd August, 1939	..	Amending regulations for trout-fishing in the Waitaki Acclimatization District.
23rd August, 1939	..	Making regulations for trout-fishing in the Waimate Acclimatization District.
30th August, 1939	..	Amending regulations for trout-fishing in the Auckland Acclimatization District.
30th August, 1939	..	Amending regulations for Fresh-water Fisheries in the Southland Acclimatization District.
30th August, 1939	..	Amending regulations for trout-fishing in the Ashburton Acclimatization District.
30th August, 1939	..	Making regulations for trout-fishing in the Lakes District Acclimatization District.
20th September, 1939	..	Amending regulations for trout-fishing in the North Canterbury Acclimatization District.
20th September, 1939	..	Amending regulations for trout-fishing in the Wellington Acclimatization District.
20th September, 1939	..	Amending regulations for trout-fishing in the Otago Acclimatization District.
27th September, 1939	..	Amending regulations for trout-fishing in the Auckland Acclimatization District.
27th September, 1939	..	Amending the trout-fishing regulations for the Waimarino Acclimatization District.
7th February, 1940	..	Amending regulations for trout-fishing in the Hawke's Bay Acclimatization District.
13th March, 1940	..	Consolidating and amending the regulations for quinnat-salmon fishing.

APPENDIX II.

AVERAGE TEMPERATURE OF SEA-WATER (AT THE SURFACE) FOR EACH MONTH OF THE YEAR AT FOUR DIFFERENT STATIONS.

Month.	Auckland Harbour (off Nelson Street Wharf).			Bay of Islands (off Russell).			Raupara Harbour (Whakapirau Estuary).			Coromandel (off Wharf).		
	1937-38.	1938-39.	1939-40.	1937-38.	1938-39.	1939-40.	1937-38.	1938-39.	1939-40.	1937-38.	1938-39.	1939-40.
	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.	°C.
May ..	15.9	17.4	16.4	14.6	17.7	17.3	14.7	15.2	15.6	14.8	17.6	16.1
June ..	13.9	15.3	14.1	13.5	13.7	13.4	13.2	12.8	13.3	13.6	14.5	14.4
July ..	12.2	12.7	11.2	13.0	12.6	11.6	11.9	11.5	11.0	12.4	13.3	11.7
August ..	12.6	12.7	11.3	13.2	12.8	11.5	12.6	11.9	10.0	12.8	13.2	12.8
Sept. ..	14.1	13.4	13.3	14.8	14.8	11.2	12.4	14.5	12.6	14.2	14.5	14.2
October ..	15.4	16.1	15.7	16.3	16.2	14.8	16.6	16.7	17.0	17.5	17.2	15.7
Nov. ..	17.3	18.3	17.8	15.2	16.0	14.7	18.3	18.6	18.7	19.4	18.4	
Dec. ..	20.0	19.1	19.7	21.1	18.1	18.4	23.5	20.6	22.3	22.8	19.6	21.3
Jan. ..	22.4	18.7	21.5	22.6	18.2	19.2	23.6	21.3	23.1	23.1	19.6	20.9
Feb. ..	23.0	19.3	19.7	22.6	19.0	17.6	23.9	20.1	..	22.6	20.4	18.6
March ..	22.5	20.8	19.3	22.1	20.5	17.1	23.4	20.1	19.4	22.4	20.3	18.5
April ..	22.0	18.7	17.8	21.3	18.3	17.3	22.6	18.6	..	20.6	18.8	17.6

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