1942.

NEW ZEALAND.

MARINE DEPARTMENT.

ANNUAL REPORT FOR THE YEAR 1941–42.

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

Marine Department, Wellington, 29th June, 1942.

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.,
R. SEMPLE,
Minister of Marine.

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

REPORT.

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

SIR,— Marine Department, Wellington, 29th May, 1942.

I have the honour to submit the annual report on the activities of the Marine Department for the year ended 31st March, 1942.

War conditions continue to impose much extra work on the Department, much of which, for security reasons, cannot be outlined in this report. Conditions in the shipping world have been what might be termed "spasmodic," and the necessity for a quick turn-round in these waters has developed a system of centralization for loading purposes. Financially this may in the long-run have an adverse effect on Harbour Boards, particularly at the minor ports.

Amenities at light stations are continually being improved, and navigational aids, such as radio beacons and automatic lights, are being progressively installed as it becomes possible to obtain the necessary plant and equipment from the United Kingdom.

HARBOURS.

The Department has continued to examine and report upon the financial and engineering sections of applications by Harbour Boards for loans and, in addition, has directly administered the ports of Westport, Little Wanganui, Kaipara, and Picton. At Picton, Kaipara, and Little Wanganui our staff provide facilities for shipping, launch inspection, &c., also act as Collectors of Customs when necessary.

At Westport dredging operations were hampered by the consistently unfavourable conditions but when operation was possible the two dredges were worked to the limit.

LIGHTHOUSES.

General repairs and maintenance, also improvements to amenities, have been given effect to at various stations throughout the year. The transfer of the G.s.s. "Matai" to other duties necessitated fresh arrangements for transport of stores and mails, but with the co-operation of the members of the staff at the stations these difficulties were overcome with a minimum of inconvenience to the personnel.

NAUTICAL.

The adjustment of compasses has received the careful administration of the Department. The demand for Admiralty charts has naturally assumed greater proportion, and it has been necessary to photostat copies of charts to meet the emergency conditions. Masters of vessels have expressed appreciation of the services rendered by this section of the Department.

During the year examinations were held in Auckland and Wellington on scheduled dates, and in Wellington on many other dates, to meet the convenience of candidates who, under present emergency conditions, were unable to present themselves on the due dates.

One hundred and thirty-one candidates presented themselves for examination, this being a decrease of 41·8 per cent. on the number last year. Thirty-two yachtsmen passed for a certificate as "Master of a Pleasure Yacht in New Zealand Waters" with the intention of joining the Royal Naval Volunteer Reserve.

The fortieth edition of the "New Zealand Nautical Almanac and Tide Tables" was published on the due date.

Present conditions obviously call for the publication of many Notices to Mariners calling attention to dangers to navigation, improved or modified navigational aids, and general information for the use of mariners.

The services to shipping by our shipping offices in the various localities have been maintained at a high level, including the provision of seamen to fill vacancies and the proper administration of the regulations for sick and injured seamen under the provisions of the Shipping and Seamen Act, 1911.

Survey of Ships.

Survey certificates were issued during the year for 26 foreign-going steamships, 12 motor-ships, 1 sailing-ship, 31 home-trade steamships, 73 home-trade motor-ships, 40 restricted-limits steamships, and 267 restricted-limits motor-ships and launches, the total certificates issued being 450, as against 477 for the previous year.

The single sailing-ship certificated during the year was the barque "Pamir," formerly owned in Finland and taken over by the New Zealand Government as a prize on her arrival at Wellington in July, 1941. She is a four-masted barque—that is, square rigged on three of her four masts—and is of 2,799 tons gross and 2,365 tons register. She was completely surveyed and refitted, including the installation of wireless and improvement of crew's accommodation, before proceeding on normal service.

Five restricted-limits vessels were surveyed for the first time. In addition to the annual surveys for certificates, 229 seaworthiness, efficiency, tonnage, and other surveys were made during the year. Thirty-five of these surveys were made to overseas ships not registered or normally surveyed in the Dominion.

Inspection of Machinery.

Boilers.

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

Fired boilers	4,641	(4,553)
Unfired steam-pressure vessels	4,705	(4,329)
Air-receivers	3,025	(2,127)
Total inspections	12,371	(11,009)

The inspections include 89 new power-boilers, aggregating 2,043 horse-power, manufactured in the Dominion, and 18 new power-boilers, aggregating 86 horse-power, imported from abroad. They also include 472 new steam-pressure vessels and 100 new air-receivers, of which numbers, 195 steam-pressure vessels and 42 air-receivers were imported.

An explosion from a steam-pressure vessel was reported during the year. This was from a cast-iron steam-press used in a large woollen-factory in Otago. The machine was twenty-nine years old, and the failure at normal working-pressure was due to the breakdown of internal stays. Complete destruction occurred, but fortunately no one was injured. Among boiler defects reported were two cases of typical lap-seam cracks in the longitudinal lap-seams of power-boilers. One case occurred in the steam and water drum of a fairly large water-tube boiler used in a dairy-factory at Waikato. The drum was renewed. The other case occurred in the outer fire-box plate of a small locomotive boiler used in a coal-mine in Westland. The defective plate was cut out well beyond the lap-seam and a new plate fitted with butt joints and double straps.

Machinery.

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

Machines not driven by steam-power in 11,227 (10,920) plants	81,323	(76,406)
Machines driven by steam-power in 1,983 (2,036) plants	10,074	(10,211)
Electric-power-supply stations	138	(151)
Lifts	3,642	(3,323)
Cranes	525	(500)
Hoists	1,691	(1,618)
Tractors	389	(371)
Total machinery inspections	97,782	(92,580)

Included in the inspections are forty-one lifts and fifty power-cranes inspected for the first time.

The numbers of accidents reported during the year in connection with boilers, pressure-vessels, and power-driven machinery were 3 fatal and 119 non-fatal accidents. The corresponding figures for the previous year were 5 fatal and 101 non-fatal accidents. In all cases the causes of the accidents were fully investigated and all practicable steps taken to improve safeguards and eliminate hazards. The number of fatal accidents was rather less than in previous years. The first accident occurred with a log-hauling winch mounted on a motor-truck. The winch had not been inspected or certificated by the Department. The shafting and gearing were not properly guarded, and in the course of work the winch-driver's trousers were caught by a revolving shaft and his right foot was torn off. He died in hospital from the injuries. The second accident occurred with a goose or swing saw. A steel rope attached to a ballast weight broke when the saw was swung forward for the purpose of cutting, and the saw came in contact with the operator's body. A permanent stop or check chain is required to be fitted to this class of machine to limit the forward travel. The machine with which the accident occurred was fitted with a check chain, but, unfortunately, it was not in position at the time of the accident. The remaining fatal accident occurred with a lift used, at the time, to transport spoil from an excavation job in a cellar. The lift was fitted with the usual safety-devices designed to prevent the car being moved from a landing unless all gates are closed. At the time of the accident the safety equipment had been wilfully rendered inoperative and so adjusted that the car could be moved from a landing with the landing-gate open. During the absence of the car from the landing a workman fell down the lift-well and received injuries which proved fatal.

The number of non-fatal accidents reported during the year, 119, is a little less than the average for the preceding five years. Under wartime conditions when workers are often working under strain and beyond normal hours and so many new workers have entered industry, an appreciable increase in the number of accidents might be expected. The circular saw with 18 accidents and the power-press with 12 accidents again proved to be the most hazardous machines used in industry in New Zealand. Particular care is given to the inspection of these machines, and safety posters issued by the Department call attention to their dangers. Thirty-five out of the total of 119 accidents occurred in the woodworking industry.

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

ACCIDENTS 1941–42.

Machines.	Sawmilling and Woodworking.	Textile.	Refrigerating.	Printing.	Metal-working and Engineering.	Laundry.	Butchery.	Confectionery and Baking.	Boxmaking.	Other Industries.	Total (Machines).
Circular saws	16	..	2	..	..	..	..	..	..	..	18
Planers	7	..	1	..	..	..	..	..	..	..	8
Shapers and moulders	4	..	..	..	..	..	..	..	..	..	4
Power presses	..	..	..	..	7	..	..	3	1	1	12
Guillotines	..	..	..	..	1	..	..	..	1	1	3
Laundry machinery	..	..	..	..	..	3	..	..	..	..	3
Mincers	..	..	..	..	..	..	1	1	..	..	2
Lifts	..	..	..	..	..	..	..	..	..	4	4
Cranes and hoists	..	..	1	..	1	..	..	..	..	1	3
Belting	..	1	..	..	..	..	..	..	..	4	5
Shafting	..	..	..	..	..	..	..	..	1	1	2
Gearing	3	1	..	..	..	..	..	..	..	1	5
Other Machines	5	3	1	5	13	..	..	10	1	15	53
Total (industries)	35	5	5	5	22	3	1	14	4	28	122

GENERAL HARBOUR REGULATIONS.

The number of accidents to persons engaged in loading or discharging or repairing ships, together with the failures of gear used in loading or discharging ships, notified under Regulation 103 of the General Harbour Regulations, was 279, of which 2 were fatal accidents.

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

Handling goods	83
Persons falling or slipping	35
Persons struck by falling or swinging loads	100
Persons stepping on or striking fixed objects	9
Contact with power driven machinery	3
Failure of gear	32
Not otherwise classified	17
Total	279

New Zealand Standards.

The Department was again represented on the Executive Committee, the Mechanical Engineering Divisional Committee, and the Fire-extinguishing Sub-committee of the New Zealand Standards Institute, and meetings were attended throughout the year. A number of draft specifications and war emergency specifications were examined and written comments furnished.

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 at the regular intervals provided for in the regulations. The total number of candidates examined was 578, of which 474 were successful.

Examination of Marine Engineers.

During the year 166 candidates were examined for Marine Engineer's Certificates of Competency at the various centres throughout the Dominion. Of these, 51 candidates were examined for First- and Second-class Certificates of Imperial Validity and 46 candidates for Third-class and Coastal Motor Certificates of New Zealand validity.

The 51 candidates for Imperial certificates were examined under the new system; of these, 24 passed for certificates, 17 partially passed, and 10 failed in the examinations.

Candidates for certificates of New Zealand validity: 34 candidates were examined for Third-class, 24 passed for Certificates, and 10 failed in the examination. Eleven candidates were examined for Second-class and one candidate for First-class Coastal Motor Certificates. All passed.

The summary for First-, Second-, and Third-class Examinations: 61·8 per cent. passed for certificates and 38·2 per cent. partly passed or failed.

The remaining 69 candidates were examined for River Engineer and Restricted-limits P.V.O.S. Certificates of Competency; of these, 61 passed for oil-vessels plying within restricted limits and 8 passed for steam-vessels plying within restricted limits.

Prosecutions.

Prosecutions instituted under various statutes of the Department during the year amounted to 24 cases, comprising Fisheries Act, 16; Inspection of Machinery Act, 5; Shipping and Seamen Act, 2; and Harbours Act, 1.

Fisheries.

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

I have, &c.,
L. B. Campbell, Secretary.

REPORTS ON FISHERIES FOR THE YEAR ENDED 31st MARCH, 1942.

Departures from the normal or the average of previous years, in the conditions which form the subject-matter and in the form of this report, will require no explanation. The industry has inevitably been affected by certain emergency measures in some cases, as well as by difficulties with regard to man-power, material, and transport, and departmental activities have also been limited by the same factors.

The following statement gives the estimated total quantity and value of the principal classes of fishery products for the year:—

	Quantity.	Value. £
Wet fish	326,863 cwt.	458,393
Whitebait	4,826 cwt.	26,825
Oysters—		
Dredged	74,751 sacks	55,928
Rock	5,939 sacks	8,908
Mussels	20,449 sacks	7,111
Crayfish	12,226 cwt.	17,077
Toheroa (canned products)	166,896 lb.	11,233
Whale products—		
Oil	516 tons	15,480
Bone-dust	15 tons	45
Quinnat salmon (taken by selling licensees)—		
Netted fish	1,502 lb.	334
Angled fish	3,848 lb.	
Total values		£601,334

The returns indicate an increase in the total value of all fishery products, the grand total for last year being £577,133. With regard to landings of wet fish the quantity has decreased by 1,731 cwt., or 0·5 per cent., while the value has risen by £18,085, an increase of 4·1 per cent. The landings of dredge-oysters from Foveaux Strait increased by 8,578 sacks, or 13 per cent., with a rise in value of £8,082 (16·9 per cent.). The quantity of rock oysters marketed has increased by 157 sacks (471 bushels), or 2·7 per cent., with 12 per cent. increase in value. The commercial landings of mussels have increased by 13 per cent., from 18,088 sacks to 20,449 sacks, their total value being 11·9 per

cent. above that of last year, which was £6,355. In comparison with last year's figure of 10,615 cwt., crayfish landings increased 15·2 per cent. in quantity and 14·2 per cent. in value. The quantity of toheroa products canned is slightly less than last season's total of 169,576 lb., but the value has risen from £10,071 to £11,233. The quantity of whale-oil obtained from the Tory Channel fishery is below last year's record figure of 654 tons.

Fishing-vessels.

The total number of fishing-vessels licensed during the official year was 709, this being 113 less than the number for the previous year.

The number of licensed steam-vessels decreased from 13 to 5, motor-vessels from 678 to 604, and row-boats from 131 to 100.

Fish Landings.

The landings of the principal classes of sea-fish and shell-fish are shown for each port in Table I. Of the total wet-fish landed, snapper provided 111,027 cwt., tarakihi 44,073 cwt., groper (hapuka) 27,498 cwt., flounder 21,313 cwt., and blue cod 18,565 cwt., their respective percentages of the whole quantity of fish landed being 33·97, 13·48, 8·41, 6·52, and 5·68. These five kinds represented 68 per cent. of all the fish landed, snapper alone providing practically 34 per cent. The total catch of snapper has fallen somewhat; last year it represented 35·56 per cent. of the total. Tarakihi and groper remain very much in the same relative position as last year, though the total for each shows a slight diminution. Increased totals are shown for red cod (by 6,290 cwt., or 104·6 per cent.), barracouta (1,653 cwt., or 35·3 per cent.), sardines (1,475 cwt., or 80·6 per cent.), sole (1,451 cwt., or 9·9 per cent.), and kingfish (1,257 cwt., or 75·3 per cent.). The most marked decline is shown for blue cod, which is down by 4,935 cwt., or 21 per cent., compared with last year. Mullet landings diminished by 909 cwt., or 22·2 per cent.

The most productive months of the year were July, September, October, November, and May. The months of least fishing activity were June, January, February, April, and December. The fishing in August, which is normally good, was apparently affected to an appreciable degree by adverse weather conditions.

Method of Capture.

Of the total catch, 33,748 cwt. (10·3 per cent.) was landed from steam-vessels (mainly trawlers); motor-vessels accounted for 290,280 cwt. (88·8 per cent.) and row-boats 2,835 cwt. (0·9 per cent.).

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

Method of Fishing.	Quantity.		Value.	
	Hundredweight.	Percentage of Total.	£	Percentage of Total.
Trawl	94,347	28·9	140,015	30·6
Danish seine	124,547	38·1	147,275	32·1
Long- and hand-lines ..	79,053	24·2	124,408	27·1
Set and drag-nets or seine	28,916	8·8	46,695	10·2
Totals	326,863	..	458,393	..

Trawl-caught fish increased from last year's total of 86,818 cwt. to 94,347 cwt., and set-net and seine catches from 28,159 cwt. to 28,916 cwt., while Danish-seiner landings decreased from 131,176 cwt. to 124,547 cwt. and line catches from 82,441 cwt. to 79,053 cwt.

Two-thirds of the trawl catch was made up of tarakihi, sole, red cod, and gurnard, the respective percentages being 32·1, 15·9, 10·9, and 7·9. Of the Danish-seine catches 70·7 per cent. was snapper, while tarakihi provided 10·7 per cent. Flounder, snapper, and mullet were the principal kinds caught by set and drag-nets, and these, together with sardines, contributed 74·4 per cent. of the landings.

The line catches were headed by groper, blue cod, and snapper—33·3, 23·5, and 18·4 per cent. respectively.

Landings at Ports.

Of the total wet-fish supplies for the Dominion, 36·6 per cent. was landed at Auckland. The following ports showed an increase on the previous year's landings: Port Chalmers, by 5,882 cwt., or 24·8 per cent.; Napier, 4,738 cwt., or 28·8 per cent.; Akaroa, 1,584 cwt., or 52·8 per cent.; Awanui, 1,546 cwt., or 142·2 per cent.; and Timaru, 1,543 cwt., or 12·3 per cent.

Diminished returns were shown for Wellington, down by 3,456 cwt., or 10 per cent.; Auckland, by 5,637 cwt., or 4·5 per cent.; Kaikoura, 1,146 cwt., or 36·6 per cent.; Manukau, 990 cwt., or 38·3 per cent.; and Stewart Island, 929 cwt., or 8·2 per cent.

The fall in supplies at Auckland is almost entirely traceable to a decline in Danish-seiner catches. At this port landings of snapper have declined steadily from the 1938–39 total of 107,252 cwt. to this year's total of 87,251 cwt. The relatively greater decline of tarakihi landings here, over the same period, from 22,530 cwt. to 12,882 cwt. is attributed to the absence of steam-trawler landings.

The landings at Thames show a still greater decline in snapper-supplies (11,123 cwt. in 1938–39 and 6,941 cwt. in 1941–42). This is compensated for in the total for the port by inceased supplies of flounder (6,247 cwt. for 1941–42—the highest since 1932–33), as against an average of less than 5,000 cwt. for the previous five years.

Of the fish-supplies landed at Wellington, steam-trawler catches represented 32·6 per cent. of the total, as against 51·2 per cent. in 1940–41. Two motor-trawlers added a further 8·3 per cent., while the smaller local craft contributed the remaining 59·1 per cent. Tarakihi formed 69·1 per cent. of the steam-trawler catch and moki a further 7·4 per cent. The line boats landed increased quantities of groper and hake, but ling landings decreased by 18·6 per cent.

In the main, the fisheries of Canterbury and Otago have shown some improvement, although decreases are recorded for Kaikoura, Nuggets, and Waikawa. At Port Chalmers a smaller quantity of groper was landed compared with the previous year. Increased supplies of soles and considerably greater catches of red cod and barracouta were brought in by the motor-trawlers.

A general review of the year's returns shows that fish-supplies were well maintained in spite of certain difficulties.

Exports and Imports.

Some decline in imports and exports of fishery products was to be expected. So far as imports are concerned the Government's policy of encouraging the canning of New Zealand fish for our own consumption has been largely responsible for the low total of £20,822, which represents the value of all imported fish and shell-fish during the year. Practically all this consisted of canned goods.

The total value of £138,029 for exports has fallen below the average of recent years, but is still higher than that of any year up to 1935. Of the principal kinds exported, frozen blue cod comes first (8,424 cwt., valued at £38,136) followed by the miscellaneous category termed "other kinds" (11,702 cwt., value £35,071, the only class showing an increase over the previous year's figures), flounder (3,702 cwt. and £15,613 value), tarakihi (3,201 cwt. and £10,139 value), with snapper (2,087 cwt., value £7,088) showing the most marked decline. Of canned fishery products exported, crayfish (37,645 lb., value £4,175) shows an appreciable increase. Whitebait exports (62,948 lb., value £9,592) have fallen by 50 per cent. Oysters (194,652 lb., value £10,898) show a decline of about 30 per cent., and toheroas (74,540 lb., value £5,277) are about 12 per cent. below last year's exports. The complete table showing particulars regarding exporting ports is not given this year.

Rock Oysters.

Picking for the 1941 season commenced on 15th May and closed on 9th August. A total of 6,029 sacks was gathered from the various areas, as follows: Bay of Islands, 2,153 sacks; Whangarei Harbour, 131; Kaipara Harbour, 1,146; Coromandel, 600; Great Barrier Island, 400; Hauraki Gulf, 1,599 sacks.

The several areas in the Hauraki Gulf yielded as follows: Ponui, 509; Pakihi, 82; Pakatoa, 184; Waiheke, 307; Rakino, 18; South Shore, Tamaki Strait, 72; Motutapu, 139; Motuhihi, 280; Noisies, 8. The oysters picked from all areas totalled 6,029 sacks. By the capsizing of a barge during a gale in the Bay of Islands 90 sacks were lost; the total of rock oysters marketed was thus 5,939 sacks or 17,817 bushels.

The improved production of the rock-oyster beds shown last year was maintained and somewhat increased. Unfavourable weather conditions caused some inconvenience at times, but on the whole the season was a very successful one, the quality of the oysters marketed being maintained at a high level, and the staffs, both on the beaches and in the depot, working with efficiency and zeal.

Oyster-cultivation for the Year ended 31st March, 1942.

Area.

I. Bay of Islands: 1,490,000 borers and 2,487 pupus destroyed, 5,963 square yards of rock cleared of weeds, and 100 square yards cleared of dead shell. Cost, £290 4s.

V. Tamaki Strait: 300,600 borers and 87 pupus destroyed. Cost, £24 6s.

VI. Coromandel: 413,500 borers destroyed and 18,590 square yards cleared of grape-weed. Cost, £40 10s.

VII. Kawau: Barnacle cleaned off 275 old posts and 175 posts with seed-oysters shipped to Coromandel.

XI. Whangarei Harbour: 291,300 borers destroyed and 826 square yards cleared of grape-weed and 78 yards of oyster-bearing rock moved to better position and 208 square yards of clean rock distributed. Cost, £22 10s.

XIII. Waiheke: 752,700 borers and 364 pupus destroyed and 2,386 square yards cleared of dead shell. Cost, £35 2s.

XIV. Ponui: 369,200 borers and 40,630 pupus destroyed and 1,010 square yards cleared of dead shell and 294 square yards cleared of grape-weed. Cost, £29 14s.

XV. Patiki: 79,000 borers and 49 pupus destroyed. Cost, £8 2s.

XVI. Great Barrier Island: 232,000 borers and 250 pupus destroyed and 563 square yards cleared of dead shell and 150 square yards of clean rock distributed. Cost, £54 16s.

Total for all areas: 3,928,300 borers and 43,867 pupus destroyed, 5,963 square yards cleared of weed, 4,059 square yards cleared of dead shell, 436 square yards of clean and oyster-bearing rock shifted, 19,710 square yards cleared of grape-weed, 275 old posts cleared and 175 posts bearing seed-oysters transported from Kawau to Coromandel area. Cost, £505 4s.

Dredge Oysters.

The record quantity of 74,751 three-bushel sacks was dredged in Foveaux Strait and landed at Bluff for the 1941 season. There were fewer complaints from retailers about the low average size of the oysters supplied than was the case during the previous season, since when the size limited has been raised from 2 in. to 2⅛ in. It is believed that conservation of under-sized oysters was helped appreciably by this measure.

Toheroas.

Difficulty of transport has limited inspections, but the same limitation must also have been a considerable factor in furthering the conservation of the stocks. In most areas it would appear that propagation and growth, aided by necessary restrictions in the taking of these shell-fish, have gone far towards the restoration of the beds towards what they were before the general mortality of 1938. Recovery has been less evident on the Ninety-mile Beach than elsewhere, and this may be due largely to the fact that abstractions were not curtailed to the same extent. There is, however, evidence of an increasing abundance of younger individuals. A rapid survey of the beach from ten to forty-three miles northward from the Waipapakauri Road was made between 1st and 5th September, 1941. The results indicated a population estimated to consist of about 10,000,000 (probably more) toheroas of takable size (3 in. and over in length) and above 25,000,000 of less than 3 in. The beach to the south of the road in the vicinity of Ahipara was still very sparsely stocked. Reports from the small area of toheroa beach (Ohope Beach) in the Bay of Plenty indicate a deficiency of fully-grown toheroas, and it would appear that abstractions by the public had become more than could be replaced by natural reproduction.

Whitebait.

The estimated total production for the 1941 season was above that of the previous year, mainly on account of increased catches in the Auckland and Westland rivers. Adverse weather with low temperatures, frequent floods, and discoloured water reduced fishing efficiency everywhere, but more especially in Otago, Southland, Marlborough, Nelson, Taranaki, and the Wellington districts. In the Bay of Plenty the runs were late in appearing, but of average abundance.

Information from local returns is summarized in the following table :—

Whitebait Fishery: 1941 Season.

Inspector's Centre.	Rivers fished.	Method of Fishing.	Fishing began.	Best Month.	Number of Fishermen. (Approximately.)		Total Quantity caught. (Approximately.)
					Whole Time.	Part Time.	
							Cwt.
Auckland ..	Waikato	Hand-nets ..	3rd July ..	Sept. and Nov. ..	80	50	1,826
Auckland ..	Kaituna	Hand-nets ..	1st August	Aug. and Sept. ..	22	10	60
Auckland ..	Tarawera and Rangitaiki	Hand-nets ..	12th Aug.	September ..	..	20	80
Napier ..	Tukituki, Ngaruroro, Wairoa	Set-nets ..	1st July ..	September ..	15	30	49
New Plymouth	Waitara, Mokau, Urenui, Mimi, Waiongona, Waikaiho, Onaero	Hand and set nets	1st July ..	Sept. and Oct. ..	..	110	38
Foxton ..	Manawatu ..	Hand and set nets	July ..	October ..	..	14	30
Wellington (no return)	Waikanae, Waimiha, Otaki, Waikawa, Ohau, Hokio, Hutt, Rangitikei, Ruamahanga, &c.	Hand and set nets	July ..	October ..	..	..	20*
Blenheim ..	Wairau, Opawa, Omaka, Tuamarina	Hand-nets ..	October ..	Mid-October ..	2	30	27
Nelson (Motueka)	Motueka, Moutere ..	Hand and set nets	August ..	October ..	14	6	28
Nelson (Takaka)	Takaka, Motupipi ..	Hand-nets ..	September	October ..	6	1	9
Westport ..	Buller, Orawaiti, Mokihinui, Big Totara, Little Totara, Fox River	Hand-nets ..	August ..	October ..	30	150	338
Greymouth ..	Grey, Teremakau, Cameron's, Paroa	Hand-nets ..	September	October ..	6	150	200
Hokitika ..	Hokitika, Mikinui, Mahinapua, Totara, Waimea	Hand and set nets	August ..	October ..	76	200	1,297
Wataroa ..	Wataroa, Big and Little Wanganui, Maori, Paringa, Karangarua, Waitangi	Hand and set nets	September	October ..	30	25	500
Christchurch ..	Waimakariri, Styx, Ashley, Kaiapoi, Avon, Hurunui, Cooper's Lagoon, Rakaia	Hand and set nets	August ..	Oct. and Nov. ..	30	500	56
Temuka ..	Opihi, Orari ..	Set-nets ..	August ..	November ..	..	10	29
Dunedin ..	Molyneaux, Taieri, Kakanui, Waipori, Waikouaiti, Shag, Waikawa, Tokomairiro, Puerua, Pleasant, Wainakarua, Owaka	Hand-nets ..	August ..	October ..	20	10	139
Invercargill ..	Mataura, Oreti, Aparima, Waiau, Titiroa, Makerewa, Otaukau, Waikiwi	Hand and set-nets	August ..	October ..	32	12	100
							4,826

* Estimated total, no return having been received.

Fresh-water Fisheries.

Quinnat Salmon.

The pound-trap for securing hatchery material from the Hakataramea River run of 1941 was in position on 23rd April and dismantled on 12th May. In the last week in April, 94,000 salmon ova were collected and a further 591,000 in the first twelve days of May, a total of 685,000. A record of losses was kept, which showed a mortality of 26,000 prior to the eyed stage. On applying the usual test for unfertile eggs a further 38,000 were discarded, and the losses in the late embryo stages, after 70,000 had been taken for consignment to Australia, amounted to approximately 38,000. The count was made by measurement. About 550,000 ova were hatched out, and the fry were liberated in the Hakataramea in the month of July, about 20,000 being kept for the ponds, of which 3,054 were marked and liberated in January, 1942, 5,897 in February, and the remaining yearlings were liberated in March prior to the closure of hatchery operations for the duration of the war.

The run of quinnat in the Hakataramea River continued till August. Late runs of salmon were also reported from the Rakaia and Rangitata rivers. The Westland Acclimatization Society reported that salmon of large size and in considerable numbers were observed in McDonald's Creek in June, 1941

The fishing season of 1942 was marked by unusually early runs in the Canterbury rivers. The first salmon of the season, a fish of 11 lb. weight, was caught in the Waimakariri on 16th November, 1941. Angling conditions were good in the early part of the season, and many fish of good size and condition were taken by anglers in the Waimakariri, Rakaia, Rangitata, and Waitaki, as well as in the smaller rivers Hurunui, Ashley, Ashburton, and Apiti.

Returns of catches made by holders of salmon-selling licenses are summarized below.

Quinnat Salmon, 1942.

——	Males.	Females.	Sex not given.	Totals.
Returns from Rods.				
Waimakariri River, 1/3/42 to 7/3/42 (1 rod)—				
Number of fish caught	4	2	..	6
Total weight	53 lb.	43 lb.	..	96 lb.
Average weight	13·2 lb.	21·5 lb.	..	16·0 lb.
Rakaia River, 9/2/42 to 30/4/42 (3 rods)—				
Number of fish caught	47	31	4	82
Total weight	807·5 lb.	510·5 lb.	39 lb.	1,357 lb.
Average weight	17·2 lb.	16·5 lb.	9·7 lb.	16·5 lb.
Rangitata River, 6/1/42 to 24/3/42 (6 rods)—				
Number of fish caught	40	41	9	90
Total weight	736·5 lb.	626 lb.	137 lb.	1,499·5 lb.
Average weight	18·4 lb.	15·3 lb.	15·2 lb.	16·7 lb.
Opihi River, 25/2/42 to 13/4/42 (2 rods)—				
Number of fish caught	1	..	53	54
Total weight	12·5 lb.	..	883 lb.	895·5 lb.
Average weight	12·5 lb.	..	16·7 lb.	16·6 lb.
Combined rivers, 6/1/42 to 30/4/42 (11 rods*)—				
Number of fish caught	92	74	66	232
Total weight	1,609·5 lb.	1,179·5 lb.	1,059 lb.	3,848 lb.
Average weight	17·5 lb.	15·9 lb.	16·0 lb.	16·6 lb.
Returns from Nets.				
Waimakariri River, 6/2/42 to 24/3/42 (1 net)—				
Number of fish caught	56	69	..	125
Total weight	685 lb.	817 lb.	..	1,502 lb.
Average weight	12·2 lb.	11·5 lb.	..	1·20 lb.

* One rod fished on two rivers during the season.

Atlantic Salmon.

A succession of freshes in the Upukororo River which delayed the completion of the rack was followed by about a month of low-water conditions. A small fresh on 12th May induced the first 19 salmon into the trap and by the end of the month 114 fish, of which 53 were males and 61 females, had been taken. From then till the removal of the trap on 27th August the river remained very low for the most part, and few fish were on the move. The catches of salmon were 4 male and 2 females in June, 2 males only in July, and 4 males and 3 females in August. Many spent fish were observed above the rack in July and August, which must have run during the high river conditions in April. From the 66 females stripped, a total of 144,000 eggs was obtained for the hatchery, the first lot of 24,500 being put down on 4th June and the last batch of 8,000 on 10th September. The ova were hatched out with very little loss, and all fry were fed in the hatchery boxes for at least two months before liberation. Between 4,000 and 5,000 were reared in ponds to be marked before liberation. (Four hundred and fifty-seven *Salvelinus fontinalis* were also reared to the yearling stage for the Southland Acclimatization Society.)

Reports of the 1941-42 angling season indicate that the stock of Atlantic salmon in the Waiau system has maintained the improvement shown in recent years. Many fish of good condition weighing up to 8 lb. were caught in Lake Te Anau, a smaller run of sizes being taken by anglers in the river,

Research.

Fresh-water Fisheries.

Before leaving to join the military forces on 26th February, 1942, Mr. K. R. Allen had largely completed the intensive study of the trout population of the Horokiwi River, on which he had been mainly occupied over the last three years. This was planned to be the first stage of a progressive programme for the study of the quantitative relation between a trout population and its food-supply. The programme which has been drawn up consists of three stages—first, a detailed study of existing relationships in a selected water; secondly, artificial modifications of the density of the stock in this water, and a study of the resulting effects on the fish population and the food-supply; thirdly, an extension of the work, possibly in a rather less elaborate form, in waters of other types. In last year's report a summary of *interim* progress was given. For this year Mr. Allen has written a more comprehensive, though still compressed, report, with a view to its publication in the near future, in which are outlined the methods used and the principal results so far obtained. It describes the preliminary survey of the Horokiwi and its main tributary and the classification of the waters into ecological units according to the types of conditions, which are mainly dependent upon the depth and rate of flow of the water. The trout population was studied by netting six selected stations as thoroughly as possible every three months. This was done regularly from July, 1940, till October, 1941; except for July, 1941, when it was prevented by unfavourable weather. From 1939 observations have been made on the spawning of the trout in the Horokiwi as a basis for an estimate of the numerical strength of the new generations of successive years. From November, 1939, till June, 1941, monthly samples of fish were taken from the principal areas of the stream, both by day and by night, for the examination of stomach contents. Data provided by the periodical netting yielded information regarding the growth of the trout. The growth of individual fish, together with their migration, was studied by means of systematic marking experiments. Egg-production and year-group mortalities have also been elucidated by these observations. The average egg-production has been found to show a simple relation to the length of the fish, being given by the formula—egg production = 75 (L–17) where L is the length of the fish in centimetres.

The general aim of this research is to determine the three basic qualities necessary for the investigation of the problem of production—viz., the *stock*, or quantity, present in the area at any one time; the *production*, or quantity, of fish-flesh grown during a given period, and *the crop* (*i.e.*, the quantity removed by man during the year).

In the study of food-supply comparison between the quantity of bottom fauna present and the food requirements of the trout stock has shown that the quantity of bottom fauna eaten by the trout during a year is several times greater than the average quantity present at any one time.

During the greater part of the year Mr. D. F. Hobbs continued his comprehensive examination of available data on the subject of trout-reproduction and the influence of fish cultural operations and other factors of human operation on the trout stocks of various waters in New Zealand. Field-work in this connection was confined to one visit to the Manawatu for the purpose of marking pond-reared trout with a view to ascertaining their subsequent proportional representation among the trout stock of the waters into which they were liberated. In February, 1942, Mr. Hobbs proceeded to Canterbury and commenced an intensive survey of the eel stocks of the waters of Lakes Ellesmere and Forsyth, with a view more especially to determining the quantitative aspects of the autumn descent of eels to tidal waters in their spawning migration to the sea. Since the question of obtaining supplies (formerly imported) of fish-oil of any kind is likely to become acute with the continuance of wartime conditions, and since fresh-water eels are a potential source of supply of oil of a quality which would be suitable for human nutrition and would certainly be satisfactory for technological utilization, it was deemed advisable to procure as much information as possible on the quantity of raw material available.

Sea Fisheries.

The Marine Biologist, Mr. A. M. Rapson, has continued his current studies on certain fishes and other marine organisms of economic importance, though field observations, especially those connected with toheroas, have necessarily been affected by transport limitations. The annual visit to the three northern toheroa beaches for routine observations was made in August–September and to the Wellington beaches in October, 1941. Progress has been made in the study of the phytoplankton of the coastal water of toheroa habitats, and identifications of diatom constituents have been obtained. A biological survey of oyster-beds in Marlborough Sounds was made in July, 1941, and a report submitted reviewing the data in relation to economic and administrative considerations. The work of describing the pelagic eggs of different species has been continued, and apparently a new clupeoid species has been obtained. The programme of marking blue cod was completed in October, 1941. Information from the returns of recaptures of tagged fish has not yet attained very useful dimensions. Of special interest and utility in relation to recently originated schemes for the canning of New Zealand sardines have been the Marine Biologist's investigations upon the sardine or pilchard fauna of our coastal waters, more especially that of Queen Charlotte Sound and the Hauraki Gulf. Information on three other species of clupeoids has also been collected. A report on kelp investigations has been prepared in collaboration with Miss L. B. Moore, of the Department of Scientific and Industrial Research, and Mr. I. L. Elliott, of the Agriculture Department, based largely on the survey work to which reference was made in our annual report for last year.

A. E. Hefford,
Chief Inspector of Fisheries and Director of Fisheries Research.

Wellington, 16th June, 1942.

TABLE I.—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, 1942.

Name of Port or District.	Principal Kinds of Fish caught.	Quantity landed (Fish).	Total Value (Fish).	Shell-fishery (excluding Toheroa).							Grand Total Value.
				Oysters.	Value.	Mussels.	Value.	Crayfish.	Value.	Total Value (Shell-fish).	
North Island.		Cwt.	£	Sacks.	£	Sacks.	£	Cwt.	£	£	£
Awanui and district	A, K, Q, Y	2,633	2,478	..	..	..	..	15	20	20	2,498
Mangonui	Y, A, V	525	427	..	..	..	..	..	..	..	427
Whangaroa	A, C	505	577	..	..	..	..	16	25	25	602
Russell	A, E, K, C	1,010	1,660	..	..	..	..	..	..	..	1,660
Whangarei	A, E, K, Q	665	1,185	..	..	..	..	184	352	352	1,537
Great Barrier	C	7	12	..	..	..	..	124	224	224	236
Auckland	A, B, E, V, H, C	119,583	135,246	5,939†	8,908	14,162	4,945	1,140	2,149	16,002	151,248
Kaiaua	A	77	104	..	..	..	..	..	..	..	104
Thames	A, E, H, R	14,377	23,609	..	..	6,287	2,166	..	..	2,166	25,775
Coromandel	A, E	111	187	..	..	..	..	95	177	177	364
Mercury Bay	A, C	83	112	..	..	..	..	801	1,513	1,513	1,625
Whangamata	A, B, C	11	15	..	..	..	..	67	120	120	135
Waihi Beach	A, Q, B, K	503	646	..	..	..	..	12	17	17	663
Tauranga and district	A, C, Q, B	4,368	5,113	..	..	..	..	341	569	569	5,682
Whakatane	A, C, H, E	1,109	1,128	..	..	..	..	6	9	9	1,137
Ohiwa Harbour, Opotiki, and Cape Runaway	C, A, L	180	287	..	..	..	..	..	..	..	287
Gisborne	B, C, H	6,225	6,863	..	..	..	..	361	647	647	7,510
Napier	B, H, C, L, A	21,207	28,745	..	..	..	..	864	1,473	1,473	30,218
Castlepoint	L	174	359	..	..	..	..	1	1	1	360
Wellington	B, C, M, G, A, O	31,055	48,099	..	..	..	..	3,163	5,366	5,366	53,465
Makara	E, O, L, D	225	497	..	..	..	..	96	147	147	644
Paremata	C, A, S, O, M, H	3,251	5,946	..	..	..	..	103	132	132	6,078
Paraparaumu Beach	A, O, C, S	1,240	1,957	..	..	..	..	..	..	..	1,957
Manawatu Heads	A, E	217	408	..	..	..	..	..	..	..	408
Taugimoana	A	40	74	..	..	..	..	..	..	..	74
Wanganui	A, C	565	898	..	..	..	..	..	..	..	898
New Plymouth	A, C	487	916	..	..	..	..	28	72	72	988
Kawhia	E, A	228	686	..	..	..	..	..	..	..	686
Raglan	E, A	187	513	..	..	..	..	..	..	..	513
Manukau Harbour	K, E, A, R, Q	1,568	2,018	..	..	..	..	30	76	76	2,094
Kaipara	E, A, K	2,704	5,093	..	..	..	..	..	..	..	5,093
Hokianga	K, E, A	598	668	..	..	..	..	..	..	..	668
South Island.											
Havelock	E, D, C	571	2,214	..	..	..	..	..	..	..	2,214
Picton	C, D, S, L, B	2,132	4,293	..	..	..	..	1	1	1	4,294
Blenheim (Wairau)	I, G, F, B	1,199	1,788	..	..	..	..	30	42	42	1,830
Kaikoura	C, G, S, T	1,988	5,229	..	..	..	..	555	739	739	5,968
Lyttelton	B, I, G, H, J	14,287	27,092	..	..	..	..	133	187	187	27,279
Akaroa	J, H, B, G, I	4,586	8,387	..	..	..	..	507	398	398	8,785
Lake Ellesmere	E	1,200	3,065	..	..	..	..	..	..	..	3,065
Timaru	H, G, J, C, F, E	14,055	27,105	..	..	..	..	..	..	..	27,105
Oamaru	C, I, D	1,815	2,499	..	..	..	..	..	..	..	2,499
Moeraki	C, D, G, I	2,325	3,997	..	..	..	..	1,255	880	880	4,877
Karitane	D, N, C	451	805	..	..	..	..	2,041	1,479	1,479	2,284
Port Chalmers	I, F, N, B, E, G	29,724	33,631	..	..	..	..	57	40	40	33,671
Taieri Mouth	F, C	1,201	3,134	..	..	..	..	4	4	4	3,138
Nuggets	F, E, C	2,358	4,274	..	..	..	..	9	5	5	4,279
Owaka	F, E	260	448	..	..	..	..	3	3	3	451
Tautuku	C, D	201	411	..	..	..	..	..	..	..	411
Waikawa	F, D, C, I	3,779	5,959	..	..	..	..	19	12	12	5,971
Invercargill	E, I	61	71	..	..	..	..	..	..	..	71
Bluff	D, C, E, S	2,418	4,694	74,571	55,928	..	..	..	..	55,928	60,722
Stewart Island	D, C, S, T	10,376	17,929	..	..	..	..	..	..	..	17,929
Riverton district	D, C	721	1,417	..	..	..	..	..	..	..	1,417
Hokitika	W	24	44	..	..	..	..	..	..	..	44
Greymouth	F, I, H	1,944	2,823	..	..	..	..	..	..	..	2,823
Westport	F, C, E	633	1,167	..	..	..	..	130	142	142	1,309
Golden Bay	A	132	196	..	..	..	..	..	..	..	196
Motueka	A, B, C	1,237	1,835	..	..	..	..	..	..	..	1,835
Nelson	A, H, C, E, F	4,973	9,889	..	..	..	..	35	56	56	9,945
French Pass	D, C, A, S	2,586	4,834	..	..	..	..	..	..	..	4,834
Chatham Islands	D, C	3,908	2,637	..	..	..	..	..	..	..	2,637
Totals		326,863	458,393	80,510	64,836	20,449	7,111	12,226	17,077	89,024	547,417

* Not including whitebait.

† In addition 90 sacks of oysters were picked but lost owing to the capsize of the oyster barge.

KEY TO SYMBOLS USED.

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

APPENDICES.

APPENDIX I.

LEGISLATION.

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

Part I.

The Sea-fisheries Regulations 1939 were amended as follows:—

25th June, 1941	..	Revoking the regulations restricting the taking of female crayfish.
23rd July, 1941	..	(*a*) Regulating the dredging for oysters from Cape Campbell to Farewell Spit and islands adjacent thereto. (*b*) Extending the area on the Ninety-mile Beach from which toheroas may be taken for canning purposes.
22nd October, 1941	..	Prohibiting the taking of whitebait below the Cobden Bridge in the Grey River.

Part II.

10th September, 1941	..	Making regulations for taking trout in the Wellington Acclimatization District.
10th September, 1941	..	Making regulations for taking trout in the Otago Acclimatization District.
1st October, 1941	..	Amending regulations for taking trout in the South Canterbury Acclimatization District.
1st October, 1941	..	Making fresh-water fisheries regulations for the Southland Acclimatization District.
1st October, 1941	..	Amending regulations for trout-fishing in the Auckland Acclimatization District.
1st October, 1941	..	Amending regulations for trout-fishing in the North Canterbury Acclimatization District.
1st October, 1941	..	Amending regulations for trout-fishing in the Waitaki Acclimatization District.
1st October, 1941	..	Making regulations for trout-fishing in the Ashburton Acclimatization District.

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