FISHERIES DEPARTMENT, WESTERN AUSTRALIA

MONTHLY SERVICE BULLETIN

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STAFF NOTES

The Relieving Inspector (Mr. A.K. Melsom) has been appointed inspector in charge of Fremantle district vice Mr. W. Davidson, retired. He entered on his new duties on March 29.

Mr. G.C. Jeffery (Fauna Warden) is being appointed Relieving Inspector, and Mr. S.W. Bowler, Inspector, Mandurah, will take up the position of Fauna Warden when he resumes duty early in April after 3 months' long service leave.

The vacancy at Broome will be filled by the promotion of Assistant Inspector R.J. Baird. Mr. Baird, accompanied by his wife and three young children, flew to Broome on March 24, taking over from Relieving Inspector Melsom on the following day.

Mr. H.B. Shugg, Fauna Officer, is at present in the Albany district, investigating, with Inspector B.A. Carmichael, reports of damage to crops, pastures, etc., by kangaroos and emus.

The Research Officer (Mr. B.K. Bowen) is at Shark Bay in r.v. "Lancelin".

Assistant Inspector M.J. Simpson, of Mandurah, and Mrs. Simpson, are receiving congratulations on the birth of their second child, another girl. We join heartily in those congratulations. Mr. Simpson is at present assisting Inspector Crawford at Geraldton.

The Superintendent (Mr. A.J. Fraser), as Chairman of the Fauna Protection Advisory Committee and the Rottnest Biological Station Committee, accompanied by Fauna Protection Officer H.B. Shugg and Research Officer B.K. Bowen, secretaries of the respective committees, together with members of the Committees, visited Rottnest Island on March 23 and 24. They were given an outline of the quokka research work carried out to date by Dr. A.R. Main of the Zoology Department of the University of W.A. Dr. Main conducted the visitors to control quadrats which demonstrated the overgrazed condition of the Island. A meeting of the Rottnest Biological Station Committee was held on March 24. Early next month the Superintendent will visit the Bunbury District.

The Fauna Warden (Mr. G.C. Jeffery) resumed duty on March 26 after annual and long service leave.

Assistant Inspector T.B. Baines recommenced in the Fremantle District on March 26 after annual leave.

Technical Officer J. Traynor returned from the Woodanilling - Kojonup Districts on March 22 to carry out further duck banding in the metropolitan area.

Miss V.T. Hogan of Head Office will resign from the public service on April 18. On April 20 she will marry Mr. V.R. Priest, of Maylands, at St. Mary's Church of England, Colin Street, West Perth.

Miss P.J. Pegrum of Head Office will commence annual leave on April 18.

Senior Inspector J.E. Munro will commence 3 months' long service leave on May 1.

Technical Officer L.G. Smith will return to duty after long service leave on April 4.

Inspector N.E. McLaughlan of Shark Bay is scheduled to commence annual leave on April 29.

PERSONAL PARS

Dr. G.F. Humphrey, Chief of the Division of Fisheries and Oceanography, C.S.I.R.O., was in Perth from March 24 to 29. During his visit, which was largely connected with the tapering-off of research activity in this State, Dr. Humphrey had interviews with the Minister for Fisheries (Mr. Kelly) and discussions with the Superintendent.

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During a recent visit to Perth, the Japanese Ambassador to Australia (Mr. Tadakatsu Suzuki) called on the Superintendent to discuss pearling matters affecting his nationals working in the pearling grounds out of Broome and Onslow.

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Our congratulations go to Dr. D.L. Serventy, a Principal Research Officer of the Wildlife Survey Section, C.S.I.R.O., Perth, a very old friend of the Department, on the recent award to him of a medallion for having contributed most to natural history in Australia during the last year. The award is made annually by a committee of Australian organisations interested in natural history, and is for both educational and research activities.

WHALING - 1956

Catch and production figures for the 1956 humpback whaling season may be seen on page 74. The fin whale taken at Albany was counted the equivalent of one humpback for quota purposes but is shown separately to give a truer picture of production.

While the evidence is not sufficient to take an improvement in the humpback stocks for granted, at least the figures do lend themselves to such a proposition. It will be seen that the average lengths of both males and females continued the upward trend noticed in 1956, but it must be borne in mind that the system of

HUMPBACK WHALING - 1956

STATION AND SPECIES	WHALES TAKEN			AVERAGE LENGTH			PRODUCTION				
							Oil				
	Males	Females	Sex Not Known	Total	Males	Females	Total	Per Whale	Per Whale-foot	Meal, etc	Solubles
					ft.	ft.	barrels	barrels	barrels	tons	tons
Carnarvon (humpbacks)	617	383	-	1,000	40.51	42.37	50,135	50.134	1.216	2,910	1,801
Albany (humpbacks)	58	61	-	119	38.48	41.93	5,801	48.74	1.211	283	149
fin whale	1	-	-	1	66.6	-	60	60.0	.9		2
TOTAL - 1956	676	444	-	1,120	40.34 *	42.31 *	55,996	50.00 *	1.215 *	3,193	1,952
TOTAL - 1955	577	539	4	1,120	39.9	41.8	54,532	48.7	1.19	2,708 Ø	1,002
TOTAL - 1954	690	619	11	1,320	38.8	40.5	62,955	47.7	1.2	3,312 X	1,425

* Fin whale production not included in humpback averages.

Ø Plus 42 bales of baleen.

X Plus 337 bales of baleen.

paying bonuses on all whales over 40 feet in length must have had some influence on the increased size. The average number of barrels of oil per whale and per whale-foot also increased. This could have been due to either greater efficiency of extraction methods and machinery, or improvement in the condition of the whales, or both.

Perhaps the most healthy sign was the increase in the percentage of males to the total catch. When the total quotas for Western Australian stations were in 1955 reduced from 1320 to 1120, it was pointed out that the percentage of males taken had dropped alarmingly from 71% in 1949 to 52% in 1954. In 1955 the percentage dropped still further to 51.5. Its rise to 60% in 1956 is therefore encouraging as it suggests an improvement in the sex ratios of the stocks. However, it would be dangerous to take this lone instance as proof of complete recovery of the stocks, as it could so easily have been due to chance, or to a change in seasonal movements, or to some other imponderable.

Keeping in mind the facts that the value of each whale fluctuates according to size and condition, and that the products are marketed at differing prices, the average gross value of each whale is estimated at £1,100 making the annual value of the industry to the State approximately £1,232,000.

TROCHUS AND PEARLSHELL INDUSTRY IN TORRES STRAIT

Due to the early commencement of the monsoonal period, the 1956 season in northern Queensland closed some six weeks sooner than usual. Normally it would have gone through to about mid-January. Unfortunately the period which was lost was that in which the best weather normally prevails and good takes are recorded.

The official production figures will no doubt reflect the loss of this period when they become available. Apart from the early onset of the monsoons average weather conditions generally had been experienced.

Prices have remained steady at a high level. M.O.P. was shipped mainly to the U.S.A., a small quantity going to U.K. Trochus shell was exported to Europe, Hong Kong and Japan.

The Island Industries Board, which handles all Queensland production, has reported that sales arrangements under which they had been operating for the past three years expired on January 31. Negotiations for the ensuing period are now taking place.

DETECTION OF OFFENDERS

In several instances recently reports of breaches of the Fisheries Act and Regulations have contained so little detail that a true picture of what really occurred has not been presented. This has resulted in long delays in launching prosecutions against offenders, thus to a certain degree nullifying the efforts of officers concerned in maintaining order in their respective districts.

In order to tie up our case more securely and to shorten the period between the commission of the offence and subsequent court action, officers would do well to incorporate in reports as many of the following as possible -

Identification

When dealing with an offender at night, note carefully any characteristic about his features that will help to prove his identity later. If necessary seek Police aid. Should a boat be concerned in the offence, look for some permanent fixture such as ringbolt, seats, an unusual detail in the boat's structure, a flaw in planking etc., and memorise any peculiarity.

Should a car be present jot down the number immediately. This is important.

Undersize fish

When undersize fish have been seized, make every effort to contact the owner. If this is not

immediately possible, do so at the first opportunity. An admission of ownership by the person concerned is good evidence, therefore engage the fisherman in conversation with the object of getting such evidence from him.

Measuring of Fish

Where possible do this in the presence of the owner or person in charge. Give him every chance to check your measurements. In order that a true assessment may be made of the seriousness of the offence it is important that the number of size as well as under-size fish in each container should be noted, as well as the total quantity seized.

General

When contemplating action against a person suspected of fishing professionally without a license, it is imperative that evidence be produced to the effect that the person concerned did in fact catch fish for sale on a specific date.

C.S.I.R.O. AND FISHERIES RESEARCH

In the February issue of the Bulletin appeared a note concerning the virtual closing down of C.S.I.R.O. fisheries research activities in this State. A statement was made attributing to Professor N.S. Bayliss, Chairman of the W.A. State Committee of C.S.I.R.O., certain comments in a Perth newspaper. This was the interpretation placed by departmental officers on the article referred to.

Professor Bayliss has now written to say that the press statement was not due to him, and that the only part of the article for which he was responsible was a brief section at the end. This merely represented general comment following a request by the newspaper concerned.

We regret that this error occurred, and apologise to Professor Bayliss for any inconvenience he may have suffered as a result.

DUCK BANDING

Since publication of the previous issue of this Bulletin, a further 214 ducks have been banded in the Woodanilling, Kojonup and metropolitan districts. Of these, 132 were black duck, 60 grey teal and 22 white-eyed duck. Mr. Traynor at the time of going to press was being assisted by Technical Officer J.S. Simpson, at Queen's Gardens, Perth, and was having considerable success. The number of recoveries is beginning to taper off, as is usual at this stage of the open season. The table hereunder sets out additional recoveries.

Band No.	Banding		Recovery		Distance Flown
	Date	Place	Date	Place	
			Black Duck		
3627	21/2/56	Queen's Gardens	17/3/57	Gingin Brook	45 miles
6392	25/1/57	Craigs Lake, Kewdale	17/3/57	Chittering Lake	40 "
6733	22/3/57	Bennecke Swamp, Kojonup	31/3/57	Bennecke Swamp	--
1952	4/5/53	Queen's Gardens	28/3/57	Muddy Lake, Bunbury	105 "
3234	3/2/55	Cape Riche	Mar.'57	Pools in Eyre River, Cape Riche	--
3402	7/2/55	Cape Riche	do.	do.	--
2744	19/5/54	do.	do.	do.	--
			Grey Teal		
3140	8/12/54	Lake at Meckering	2/3/57	8 mls north Ongerup	180 "

Band No.	Banding		Recovery		Distance Flown
	Date	Place	Date	Place	
		Grey Teal (contd.)			
3867	25/3/56	Wardering Lake	23/3/57	Cooks Farm, Moora	195 miles
3381	5/2/55	Cape Riche	24/3/57	Taarblin Lake	135 "

OUTSTATION BANKING AND ABSTRACTS

Complaints have been received from the Audit Department that certain outstations have failed to bank their moneys at regular intervals and to furnish abstracts of collections to the Clerk of Courts or Treasury, as the case may require.

Inspectors are reminded that the Treasury Regulations stipulate that all moneys received shall be banked where possible daily, but never less frequently than once weekly. An abstract should also be furnished at least once each week. On no account must departmental moneys be held by an officer for any period in excess.

In the event of no revenue being collected the inspector should forward a "nil" abstract fortnightly.

In all cases where an ordinary receipt is written the inspector must insert the name of the person concerned on the abstract.

Inspectors must adhere strictly to these requirements.

CONVICTIONS RECORDED

January 1, to March 31, 1957

Date	Defendant	Court	Charge	Result
25.2.57	Siggins, L.	Fremantle	Undersize C/fish	Fined £15
do.	Dean, G.C.	do.	do. do.	" 2
do.	Miles, C.	do.	do. do.	" 2
28.3.57	Melsom, Carl	do.	do. do.	" 2
do.	Pittorino, V.	do.	Spawning do.	" 5
do.	Vinci, C.	do.	Fishing in closed waters	" 10
do.	Bernardo, C.	do.	Undersize C/fish	" 2
18.1.57	Hancock, B.P.	Ger'ton	do. do.	" 2
do.	Prater, R.F.	do.	do. do.	" 2
do.	Grubba, J.	do.	do. do.	" 2
13.2.57	Heath, R.	Perth	do. do.	" 4
do.	Hill, F.	do.	do. do.	" 4
do.	Stewart, E.	do.	do. fish	" 10
		Fauna Protection Act		
18.1.57	Wann, A.	Ger'ton	Taking protected fauna without a license	" 2
do.	Dawe, E.	do.	do.	" 2
6.2.57	Cox, N.L.	Pinjarra	do.	" 10
do.	Cox, C. (jnr.)	do.	do.	" 3

THE CLEARING HOUSE

World Fish Catch Rises More than 40 Per Cent in 7 Years

The world catch of fish has risen by more than 40 per cent since 1948, from about 19,400,000 to about 27,700,000 metric tons in 1955, according to the FAO Yearbook of Fishery Statistics (Vol. V, Production and Fishing Craft), just published by the Food and Agriculture Organisation (FAO), Rome. The catch is almost 40 per cent higher than it was before the 1939-45 war.

This latest edition of the FAO Yearbook includes statistics from more than 150 countries and territories, given in 72 tables and for the first time, important summary data are shown in diagrammatic form. Detailed tables are given for 73 selected countries, which land about 75 per cent of the world catch.

Remarkable Recovery Since War

The tables reflect the remarkable recovery of the world's fishing industry since the war with Japan firmly in the lead of fishing nations. In 1948 the Japanese fishing fleet landed about 2,430,000 metric tons. By 1955 the figure had risen to 4,720,000 metric tons, some 2,000,000 tons more than the second biggest fishing nation, the United States, which, including Alaska, landed 2,687,000 metric tons in 1955. USSR, with an officially published 2,500,000 metric tons (excluding aquatic mammals) is the world's third largest fish producer.

According to the FAO Yearbook, quoting statistics published in China (mainland), that country is the fourth biggest fishing nation with an estimated 2,000,000 metric tons in 1955.

Other fishing nations catching more than 1,000,000 metric tons annually are Norway (1,867,000) and the United Kingdom (1,099,700).

A considerable part of the increased fish production is being used for reduction to fish meal and solubles. This is indicated in the statistics which show that in 1938 some 656,000 metric tons were used for reduction purposes. Since 1948 the tonnage has increased yearly and by 1955 had reached 1,154,000 metric tons.

Outstanding increases in fish production are recorded in the FAO Yearbook for Africa, Asia and South America, as well as for Europe. Taking 1948= 100, the total African catch rose from 63 in 1938 to 231 in 1955 - in tonnage from 440,000 to 1,620,000. Angola, for example, increased its catch from 26,200 metric tons in 1938 to 290,000 metric tons in 1955.

Over the same period South West Africa (including the Walvis Bay area) shows an even greater increase, from 4,000 to 240,000 metric tons, while figures for the Union of South Africa rose from 63,900 to 357,700 metric tons.

The expansion in Southern Africa reflects the post-war development there of canneries and fish meal plants.

Comparative figures for the continents and regions are :

	1938	1955
Africa	440,000	1,620,000
America (N)	3,150,000	3,800,000
America (S)	230,000	760,000
Asia	9,350,000	11,280,000
Europe	5,540,000	7,650,000
Oceania	80,000	110,000
U.S.S.R.	1,520,000	2,500,000

Some interesting increases have taken place in South America, particularly in Chile and Peru, as the following figures (in metric tons) for 1938 and

1955 show: Chile from 32,200 to 214,200 and Peru from 35,900 (1948) to 170,000. Other increases in fish production in South American countries are: Argentina from 55,300 to 78,900; Brazil from 103,300 to 172,000 (1954) and Ecuador from 1,800 to 15,000.

Big Increases in Asia

According to the available statistics, the Yearbook records the following figures for some Asian countries: India, 744,000 metric tons (1952) and 839,000 (1955); Indonesia, 472,000 metric tons in 1938 (for the territories of the Netherlands East Indies) and 651,500 in 1955 (for the Republic of Indonesia); Pakistan, 243,000 (1952) and 270,900 metric tons (1955). The figures for Thailand are 161,000 (1938) and 213,000 (1955), and those for Turkey over the same period are 76,000 and 111,500 metric tons.

There has been a particularly striking increase in the fish catch of the Philippines from 80,900 in 1938 to 385,300 metric tons in 1955. These figures exclude molluscs used for duck feed.

In Europe, increases have been made by the following countries:

	1938	1948	1955
		(metric tons)	
Belgium	42,900	70,800	80,000
Denmark (ex. Greenland)	97,100	225,900	425,300
Faroe Islands	63,000	92,300	105,600
Greece	25,000	33,600	60,000
Iceland	274,300	478,100	480,300
Italy	181,200	156,600	217,900
Netherlands	256,200	294,100	319,000
Norway	1,152,500	1,504,000	1,867,700
Portugal	240,000	274,500	390,600
Spain	408,500	547,200	762,800
Sweden	129,200	193,900	200,000

There is little change in the catches of France and the United Kingdom. France caught 530,300 metric tons in 1938 as compared with 522,700 in 1955 and the United Kingdom 1,197,800 as compared with 1,099,700 metric tons in the same years.

West Germany provides interesting comparative figures. In 1938 Germany (including East Germany and other areas of pre-war Germany) caught 776,500. In 1955 West Germany alone caught 776,900 metric tons.

Both Australia and New Zealand have increased their fish production, Australia from 33,500 (1938) to 52,100 (1955) and New Zealand from 27,000 to 39,200 metric tons over the same period.

Catches Listed by Species

Among the many interesting tables in the new FAO Yearbook is one which gives the world catch by groups of species in 1954. This table shows that herrings, sardines, anchovies, menhaden, etc., make up the largest group, yielding 7,000,000 metric tons a year or 27 per cent of the grand total of 26,600,000 metric tons, live weight, while the group made up of cods, hakes, haddocks, etc., yields 4,200,000 or 16 per cent. Fresh water fish account for 2,600,000 metric tons (10 per cent) and molluscs for 2,500,000 (9 per cent). Tunas, bonitos and mackerels account for 1,700,000 metric tons (6 per cent).

Northern Waters Most Productive

The waters of the northern hemisphere temperate zone and Arctic are the most productive, yielding 18,700,000 metric tons live weight, or about 70 per cent of the world total. The tropical zones account for 4,100,000 (16 per cent) and the southern hemisphere temperate zone for 1,400,000 metric tons (5 per cent).

The FAO Yearbook is arranged in eight sections, A to H. The first four give details of catch and landings. Section E gives disposition of the catch and F shows production of preserved and processed commodities. Section G deals with fishing craft and section H with the whale catch.

Five New Tables of Statistics

There are five new tables of statistics in this edition. The first, A-5, shows the world

catch and landings by countries arrange by regions, thus providing comparable figures for the regions. B-2, which gives catch and landings in quantities by groups of species and by countries, is also a new table. So is F-1, a summary of production of preserved and processed commodities in selected countries. The two other new tables, H-1 and 2, provide statistics of the catch of whales by whaling areas, and by countries and whaling areas.

As the foreword states, the inclusion of more information "has been made possible partly by improvements in the basic data obtained, including previously unavailable official or semi-official figures for some countries, and partly by a more extended use of estimates in the calculation of totals."

The Yearbook is available from all FAO sales agents throughout the world, price $3 or 15s. or the equivalent in any national currency.

("The Fishing News" London January 11, 1957)

New Gear and New Gimmicks

Ocean gillnets were the notable gear development of 1956 in the Pacific fisheries, and the stir created by their advent may herald their disappearance before the Canadian and American fisheries have made use of this type of gear comparable with its employment by the Japanese.

Admittedly, the gear used by Americans and Canadians in fishing salmon on the high seas was patterned after the Japanese nets perfected for this purpose; and also after those used by American research vessels in their studies of salmon distribution throughout the North Pacific.

Gear employed by the ocean gill-netters pioneering this fishery out of Puget Sound generally was about 1,000 fathoms in length, 6½ inch nylon gillnetting, 50 meshes deep. Best method of hanging appeared to be with the selvage of the net hitched directly to cork and lead lines.

The nets generally were power-hauled, either by means of a drum seine reel, or with a Puretic power block.

Whether ocean gill-netting will be permitted to continue was undetermined at time of writing. In Alaska Federal authorities already have put into force regulations forbidding the taking of salmon by means of nets outside of territorial waters. Canada was agitating for similar action, and the three Pacific states were considering uniform legislation to this end.

Reasons for the opposition to ocean gill-netting were several:

1. It would impair conservation of the fisheries through making proper determination of the degree of utilisation difficult if not impossible where such fishing was carried out on the high seas and outside of treaty waters.

2. It would constitute destructive exploitation of a fishery already fully developed.

3. It incurred the opposition of other forms of gear operating in inshore waters.

High Seas Seining

In a measure akin to high seas gill-netting, but thus far used only for scientific research, was a specialised form of purse seining on the high seas many miles from land.

This form of fishing was employed successfully in 1956 for the first time by two vessels, the Renown and the California Rose, engaged in tagging salmon on the high seas under a contract to the Fisheries Research Institute from the American Section of the International North Pacific Fisheries Commission. Making blind sets, and fishing with no visual evidence of the presence of salmon, the researchers were able to make satisfactory catches, particularly after experimentation determined the direction of salmon movement, because one direction of net opening always gave superior results.

Power Block Standard

It is doubtful if any fishing gear innovation ever scored more instant success and more complete acceptance than the Puretic power block. This is a power-driven, rubber-covered sheave operated at the boompoint of a conventional purse seine vessel. The net is retrieved by operating the sheave, which raises the net from the water and permits it to flow down to the turntable, where it is piled by the fishermen for the next set.

This form of fishing, covered by a patent on method and block, speedsup the fishing operation and at the same time greatly reduces the physical labour. Studies indicate that it adds at least 15% to the productiveness of a vessel.

Almost immediately following its introduction at the end of 1954, the power block began to win acceptance in the salmon and herring fleets. By the end of the 1956 season it was almost standard equipment for herring and salmon seining, and was also widely used for tuna, although for some obscure reason the sardine and mackerel fishery has never accepted it to a comparable degree.

The power blocks also have entered the menhaden fishery of the Gulf and Atlantic coasts, although differences in the traditional method of seining there have forced modification of the means by which it is employed.

Drag Deeper Yet

Where formerly 100 fathoms was thought to be about the maximum depth to which Pacific trawl fishing could be conducted with efficiency, vessels now are dragging their gear on bottoms much deeper than 300 fathoms. This has greatly increased the amount of bottom available to trawlers, and at the same time has brought species otherwise seasonably unavailable within the scope of the gear.

The greater depth has resulted from development of methods rather than of gear, but generally may be traced to trawl drums capable of carrying sufficient warp to get down deep; and also the

use of trawl floats in which planes as well as buoyancy assist in keeping the mouth of the trawl open.

New Boat Trend

Pacific Coast boat building continued a trend toward vessels of the moderate-to-small sizes in 1956. Gill-netters to a large degree were the most important segment in the new construction, although here the tendency was toward craft running to the upper limits of this classification.

In British Columbia there were a number of large seiners constructed, primarily to fish herring, with the ability to serve as salmon packers during the summer season.

Tuna clipper construction continued at moderate level, with the production of new craft not quite balancing the year's losses. The newest vessels in this category were the trio of steel craft finished by the National Steel & Shipbuilding Co., San Diego.

Seawater Refrigeration

Perhaps the most notable element of 1956 in Pacific fishing vessel equipment was the confirmation of the definite trend toward the use of chilled seawater for refrigerating the catch. This method, applied to salmon trollers, halibut vessels and other craft of this general character, which previously have landed their fish packed in crushed ice, actually adapts to their specialised field the method used for a number of years for protecting the freshness of tuna from catch to cannery.

The smaller fishing vessels, following a system developed and first applied in Canada, have found that the fish are kept in superior condition where they can be slipped immediately after catching into low temperature seawater held in the hold of the vessel at a point barely above freezing. Not only are they chilled quickly, but the water in which they are stored seems to cushion and protect them from mechanical damage.

("Pacific Fisherman" Portland, Ore. January 25, 1957)

Conservation

Harold Titus, Editor.

Wisconsin researchers are turning up enlightening information about trout fishermen while they strive for answers to some trout-management problems on Lawrence Creek, which is good, natural trout water. Careful checks on anglers trying their luck on this stream show that 53.3 percent of the trips result in the staking of no legal fish. Only 2.9 percent of the lads get their legal limit of ten trout, six inches or more in length, on any one trip, whereas an even 11 percent call it a day after taking one fish.

The stream was divided into four sections on a preseason trout-per-acre basis. The populations of these sections ranged from 1,512 down to 510. The angling hours expended in trying to land a mess varied from 368 on the best section to 511 on the poorest.

All this adds up to the conclusion that for Wisconsin residents there's a lot more to trout fishing than catching trout. They'll spend half again as much time trying to make 'em come in low-yield water as they will where more fish are available, and they keep returning to the creek despite the fact that less than half the trips result in a catch of even a lonely 6-incher.

Conditions such as those prevailing on Lawrence Creek can no doubt be duplicated by any state boasting trout water. Despite the low returns for effort expended, more and more trout fishermen appear each season, as is evidenced by increasing sales of trout stamps where they are required. And this certainly supports the contention of Al Hazzard and other fisheries authorities who believe that the extravagant programs of heavily planting legal-sized fish in good trout streams is unwarranted and that some day the public will willingly take whatever crop the trout water will naturally yield and demand no more.

Minnesota comes up with what appears to be another first. They're using high-school students to assemble data on which fish-management programs may be based, a device which promises to kill at least three birds with

one stone. The youngsters will fulfill a science-class assignment, needed information will be gathered and the teen-age generation will learn more about wildlife needs than many of us acquire in a life-time.

Ivanhoe, Minnesota, is a small community in the state's prairie section not far from the South Dakota line. Will Miller, science instructor in the public school, wanted a project for Mary Jane Bernaciak, one of his students. He asked Dr. John Moyle, chief of research for the Department of Conservation, for a suggestion and was told that information on the relationship between snow cover and oxygen content on nearby Lake Shaokatan was badly needed. Mary Jane went to work, turned up the answers, and Dr. Moyle based his recommendations for management of the lake on those findings.

No one is going to rate high-school science students as qualified researchers. But they surely can do many chores that are essential to a research program, and chances are that among other things they'll come out as loyal supporters of conservation measures. This is a new twist to the conservation education we're always talking about and which seems to develop so slowly. Strikes me that about forty-seven other states might give it a whirl.

In Colorado there is at least one justice of the peace who doesn't fool away his time. Two men were arrested in Meeker for the possession of a cow elk and three calves killed after the season closed. They appeared before Justice Glen Briggs, pleaded guilty and were fined a total of $2,100 plus costs. Such sentences as this will eventually take all the fun out of game-law violation. Every illegal kill is an act of larceny from the law-abiding sportsman, and until that day arrives when it is no longer considered cute to outwit the warden a shameful amount of time and money must go to dogging the steps of the outlaw.

That cash and energy could do much for us were it expended, say, in habitat improvement for fish or game. Properly encouraged - or, if necessary, goaded - the lower courts could hasten the dawning of that happier day.

("Field and Stream" New York February, 1957)