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# FILLET WEIGHTS AND LOSS IN FILLETING OF YELLOW PIKEPERCH, *Stizostedion v. vitreum* (Mitchill), FROM SAGINAW BAY, NOVEMBER 12-15, 1942 and MAY 3-4, 1943

by

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## Introduction

During past years law-enforcement officers of the Michigan Department of Conservation have had difficulty in the enforcement of minimum size regulations established by law for the taking of yellow pikeperch (walleye pike, yellow pickerel) for commercial purposes. Since the practice of filleting undersized fish of this species, in order to avoid detection, is apparently growing, a regulation to provide for a minimum size of yellow pikeperch fillets seems necessary. Adoption of a law specifying the minimum legal size of fillets of yellow perch, *Perca flavescens* (Mitchill), (Public Act 339, 1939) has practically eliminated a similar problem which existed when only the minimum legal total length of the fish was specified.

Saginaw Bay was chosen for this investigation since it yields the principal production of yellow pikeperch in Michigan. The main "run" of

yellow pikeperch in Saginaw Bay is in the spring (April, May, and June with the bulk of the catch taken in April) but there is another, though relatively lighter run in the fall (September, October, and November). In addition to these runs some yellow pikeperch are taken at other times of the year. Statistical records of the commercial fisheries of Saginaw Bay [1] show that during the past 10 years 84.8 per cent of the total yearly catch of yellow pikeperch has been taken during the spring as compared with 11.3 per cent during the fall (the percentage of the total yearly catch taken in the spring and fall for each year of the 10-year period 1933-1942 is shown in Table 1). The occurrence of these two distinct runs of yellow pikeperch in Saginaw Bay, one at the height of the spawning season, made it necessary to obtain data during each of the runs in order to detect possible seasonal differences in the weights of fillets and in the percentage of loss due to filleting.

With the assistance of Conservation Officer A. J. Neering, fish were obtained from the Bay Port Fish Company and the R. L. Gillingham Fishing Company at Bay Port and from the Geo. Loeffler Fish Company at Sebewaing in November 1942, and from the Bay Port Fish Company and the R. L. Gillingham Fishing Company at Bay Port in May 1943. The cooperation of all these fishermen in saving undersized fish and of the R. L. Gillingham Fishing Company in permitting the use of their facilities for the experimental filleting is greatly appreciated.

The minimum total length provided by law for yellow pikeperch taken commercially is 15 1/2 inches in State of Michigan waters of the Great Lakes other than Lake Erie. To secure a series of weights on either side of this minimum length, fish of from 13 to 17 inches, total length, were used. These fish were measured to the nearest quarter inch and each

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[1] These records are on file in the Great Lakes laboratories of the Fish and Wildlife Service, U. S. Department of the Interior, Ann Arbor, Michigan.

Table 1. Total annual production (pounds) of yellow pikeperch in Saginaw Bay, 1933-1942, and production (in pounds and percentage of total annual catch) in the spring and fall seasons

| Year | Production in entire year | Production in April, May, and June | | Production in September, October, and November | |
|---|---|---|---|---|---|
| | | Poundage | Percentage of total | Poundage | Percentage of total |
| 1933 | 1,454,772 | 1,192,579 | 82.0 | 153,125 | 10.5 |
| 1934 | 1,349,354 | 1,162,494 | 86.2 | 96,300 | 7.1 |
| 1935 | 1,292,679 | 1,161,997 | 89.9 | 82,369 | 6.4 |
| 1936 | 1,400,852 | 1,231,672 | 87.9 | 126,140 | 9.0 |
| 1937 | 1,528,938 | 1,380,804 | 90.3 | 102,223 | 6.7 |
| 1938 | 1,179,325 | 1,048,654 | 88.9 | 81,823 | 6.9 |
| 1939 | 1,492,244 | 1,290,525 | 86.5 | 158,101 | 10.6 |
| 1940 | 1,443,374 | 1,151,805 | 79.8 | 211,969 | 14.7 |
| 1941 | 1,462,587 | 1,124,415 | 76.9 | 290,381 | 19.9 |
| 1942 | 2,050,332 | 1,680,553 | 82.0 | 347,269 | 16.9 |
| Average | 1,465,457 | 1,242,549 | 84.8 | 164,970 | 11.3 |

quarter-inch group was handled separately. Messrs. Fred and Floyd Hoerman of Bay Port were engaged to do the filleting during both of the periods of investigation. These men, both of whom are commercial fishermen, have had extensive experience in dressing and filleting fish. The numbers of fish employed in this investigation were 239 in the fall (November 12-16) of 1942 and 257 in the spring (May 3-4) of 1943.

Relationship between total length and fillet weight

Table 2 shows for each quarter-inch length group of yellow pikeperch filleted in November 1942: the number of fish in the group; the minimum, average and maximum weights of the whole fish and fillets; and the percentage loss due to filleting. The corresponding data for fish filleted in May 1943 are given in Table 3. The relationship between total length and fillet weight in each of the two groups of fish is presented graphically in Figure 1 where the average weights of fillets of yellow pikeperch captured in November and May, by quarter-inch intervals of total length, are indicated by round dots and triangles respectively. The two smooth curves were fitted to the empirical data by inspection. The present section will be concerned chiefly with the problem of the proper minimum legal weights for yellow pikeperch fillets sold commercially. The subject of the loss of weight at filleting will be treated in the next section.

Two features of the data of Tables 2 and 3 have important bearings on the problem of the proper minimum legal weight for yellow pikeperch fillets. The first one is the substantially greater weight of fillets from fish captured in November as compared with those from fish taken in May. At the minimum legal length of 15 1/2 inches the difference, as estimated from the smooth curves of Figure 1, amounted to about 0.9 ounce. The difference is sufficiently great to suggest the possible desirability of separate weight limits for different seasons. From the enforcement standpoint, however, different limits in different seasons would be

Table 2. Round weights (pounds and ounces) and fillet weights (ounces) of yellow pikeperch according to length, and the percentage loss in weight in filleting, Saginaw Bay, November 12-16, 1942. The horizontal ruling in the body of the table separates legal- and illegal-sized fish

| Total length (inches) | Number of fish | Weight of fish in round | | | Weight of fillet | | | Percentage loss in filleting |
|---|---|---|---|---|---|---|---|---|
| | | Minimum | Average | Maximum | Minimum | Average | Maximum | |
| 13 | 2 | 0-11.0 | 0-12.0 | 0-13.0 | 4.8 | 5.7 | 6.7 | 52.5 |
| 13 1/4 | 5 | 0-10.5 | 0-11.8 | 0-13.0 | 5.6 | 6.2 | 7.1 | 47.5 |
| 13 1/2 | 6 | 0-12.0 | 0-13.9 | 1- 1.0 | 6.3 | 6.8 | 7.7 | 51.1 |
| 13 3/4 | 7 | 0-12.0 | 0-13.7 | 0-15.5 | 6.6 | 7.1 | 7.7 | 48.2 |
| 14 | 11 | 0-11.5 | 0-13.4 | 1- 0.8 | 5.3 | 7.0 | 8.3 | 47.8 |
| 14 1/4 | 17 | 0-13.0 | 0-15.0 | 1- 1.2 | 6.2 | 7.4 | 8.5 | 50.7 |
| 14 1/2 | 22 | 0-12.5 | 0-15.5 | 1- 2.0 | 6.4 | 7.8 | 8.8 | 49.7 |
| 14 3/4 | 21 | 0-14.8 | 1- 0.9 | 1- 3.0 | 7.7 | 8.6 | 9.7 | 49.1 |
| 15 | 19 | 0-15.0 | 1- 1.6 | 1- 4.0 | 6.5 | 8.6 | 9.6 | 51.1 |
| 15 1/4 | 19 | 1- 1.0 | 1- 2.8 | 1- 8.5 | 8.3 | 9.3 | 11.7 | 50.5 |
| 15 1/2 | 16 | 1- 1.5 | 1- 4.3 | 1- 7.5 | 8.2 | 10.3 | 12.2 | 49.3 |
| 15 3/4 | 20 | 1- 3.8 | 1- 5.7 | 1- 8.0 | 9.6 | 10.8 | 12.2 | 50.2 |
| 16 | 17 | 1- 3.0 | 1- 6.5 | 1- 8.2 | 9.4 | 11.5 | 13.6 | 48.9 |
| 16 1/4 | 17 | 1- 3.0 | 1- 7.0 | 1-10.8 | 8.9 | 11.4 | 13.0 | 50.4 |
| 16 1/2 | 18 | 1- 5.0 | 1- 8.8 | 1-11.5 | 10.7 | 12.7 | 14.1 | 48.8 |
| 16 3/4 | 11 | 1- 8.0 | 1- 9.9 | 1-12.0 | 12.2 | 13.1 | 14.3 | 49.4 |
| 17 | 11 | 1- 9.2 | 1-10.5 | 1-11.8 | 12.1 | 13.2 | 14.1 | 50.2 |
| Total | 239 | Average percentage loss ..... | | | | | | 49.7 |

Table 3. Round weights (pounds and ounces) and fillet weights (ounces) of yellow pikeperch according to length, and the percentage loss in weight in filleting, Saginaw Bay, May 3-4, 1943.

The horizontal ruling in the body of the table separates legal- and illegal-sized fish

| Total length (inches) | Number of fish | Weight of fish in round | | | Weight of fillet | | | Percentage loss in filleting |
|---|---|---|---|---|---|---|---|---|
| | | Minimum | Average | Maximum | Minimum | Average | Maximum | |
| 13 | 2 | 0-11.5 | 0-12.0 | 0-12.5 | 5.6 | 5.7 | 5.9 | 52.5 |
| 13 1/4 | 4 | 0-11.0 | 0-12.0 | 0-13.0 | 5.4 | 5.8 | 6.1 | 51.7 |
| 13 1/2 | 8 | 0-11.5 | 0-12.7 | 0-13.5 | 5.7 | 6.4 | 7.2 | 49.6 |
| 13 3/4 | 12 | 0-13.0 | 0-13.8 | 1- 0.0 | 6.5 | 6.7 | 7.2 | 51.4 |
| 14 | 16 | 0-12.5 | 0-13.9 | 0-15.5 | 5.9 | 6.9 | 7.5 | 50.4 |
| 14 1/4 | 18 | 0-12.8 | 0-14.7 | 1- 0.5 | 6.4 | 7.3 | 8.2 | 50.3 |
| 14 1/2 | 26 | 0-13.5 | 0-15.9 | 1- 2.0 | 6.4 | 7.6 | 8.6 | 52.2 |
| 14 3/4 | 24 | 0-15.0 | 1- 0.3 | 1- 2.5 | 7.1 | 8.0 | 9.0 | 50.9 |
| 15 | 27 | 1- 0.0 | 1- 1.3 | 1- 3.5 | 7.2 | 8.2 | 9.1 | 52.6 |
| 15 1/4 | 19 | 1- 0.0 | 1- 1.7 | 1- 4.0 | 7.6 | 8.6 | 9.8 | 51.4 |
| 15 1/2 | 18 | 1- 1.0 | 1- 3.3 | 1- 8.0 | 8.2 | 9.3 | 12.2 | 51.8 |
| 15 3/4 | 10 | 1- 1.0 | 1- 3.8 | 1- 5.5 | 8.4 | 9.7 | 11.0 | 51.0 |
| 16 | 13 | 1- 2.0 | 1- 5.2 | 1- 7.0 | 9.8 | 10.6 | 11.9 | 50.0 |
| 16 1/4 | 15 | 1- 2.5 | 1- 5.8 | 1- 7.5 | 9.2 | 10.9 | 12.0 | 50.0 |
| 16 1/2 | 15 | 1- 5.5 | 1- 7.1 | 1- 9.5 | 10.1 | 11.5 | 12.6 | 50.2 |
| 16 3/4 | 15 | 1- 6.5 | 1- 8.5 | 1-12.0 | 10.4 | 11.9 | 13.8 | 51.4 |
| 17 | 15 | 1- 6.5 | 1- 8.8 | 1-11.0 | 11.5 | 12.5 | 13.9 | 49.6 |
| Total | 257 | Average percentage loss ..... | | | | | | 50.9 |

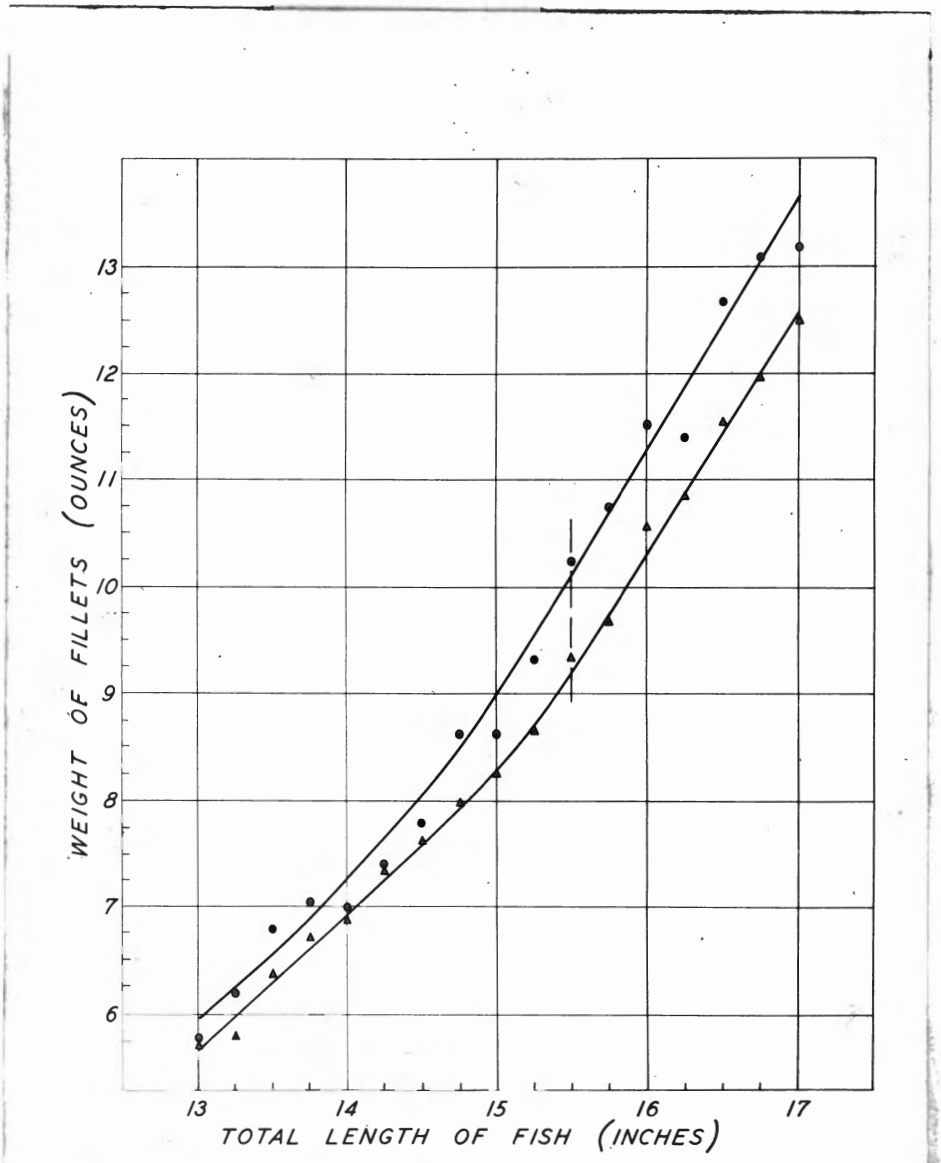


Figure 1. Relationship between the total length and the weight of fillets of yellow pikeperch from Saginaw Bay in November 1942 (solid dots) and May 1943 (triangles). The smooth curves (upper, November; lower, May) were fitted by inspection. The broken vertical line indicates minimum legal length.

impractical because of the difficulty of establishing the time of capture of fish from which stored frozen fillets were prepared once these fillets were removed from storage. Since a single minimum legal weight for fillets must be recommended, greater consideration should be given to the data collected in the spring than in the fall as the bulk of the catch is taken in the former fishery (roughly 85 per cent in the spring as compared with 11 per cent in the fall - see Table 1).

The second feature of the data of Tables 2 and 3 with a bearing on the problem of the proper minimum legal weight for yellow pikeperch fillets is the variation of the fillet weight for fish of the same length group captured in the same season. In November (Table 2) the difference in weight between the lightest and heaviest fillet from fish of the same quarter-inch interval of total length ranged from 1.1 ounces (13 3/4 inches) to 4.2 ounces (16 inches). In May the difference ranged from 0.3 ounce (13 inches) to 4.0 ounces (15 1/2 inches). Similar variations occurred in the round weights of yellow pikeperch of the same length interval.[2] Because of the variability of the weight of fillets from fish of the same length group, it is obvious that with any minimum legal weight of fillet that reasonably could be considered some yellow pikeperch below legal length will produce legal-sized fillets and some fish at or above legal length will yield undersized fillets.

From the preceding considerations it is possible to set forth two approximate requirements for a suitable minimum legal weight for yellow pikeperch fillets as based on data of the present investigation. First, the minimum legal fillet weight should be near the value 9.2 ounces, the

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[2] The heaviest fillet did not necessarily come from the heaviest fish of a length group nor the lightest fillet from the lightest fish. In the field procedure the individual fillets were not identified with the individual fish.

point of intersection of the line, length = 15 1/2 inches, with the lower of the smooth curves in Figure 1. Second, the weight limit should be such that excessive numbers of yellow pikeperch of less than legal length can not produce fillets of legal weight, while at the same time large numbers of fish of legal length should not produce undersized fillets. Practical considerations of enforcement dictate a third requirement, namely that the minimum legal fillet weight should not involve a fraction of an ounce smaller than a quarter.

The records of the numbers and percentages of yellow pikeperch below the legal length of 15 1/2 inches that produced legal-sized fillets and of fish at or above legal length that yielded undersized fillets at five assumed fillet weights from 9 to 10 ounces provide useful information on the problem of the proper weight limit for fillets (Table 4). In this table data are given for only those length groups containing undersized fish that actually yielded legal-sized fillets or legal-sized fish that produced undersized fillets at some one of the assumed minimum weights.

It is immediately apparent that the limits of 10 and 9 3/4 ounces cannot be considered, for at both weights the percentages of legal-length yellow pikeperch in both collections that produced undersized fillets were considerably greater than the corresponding percentages of undersized fish that produced legal-sized fillets. At 9 1/2 and 9 1/4 ounces the percentage of undersized fish producing legal-sized fillets exceeded the percentages of legal-sized fish producing undersized fillets in the November samples, but the reverse situation held for those fish taken in May. It was only at the 9-ounce limit that the yield of legal-sized fillets from undersized yellow pikeperch and of undersized fillets from legal-sized fish were approximately equal. It is this minimum legal weight that is recommended for the State of Michigan for the fillets of yellow pikeperch sold commercially.

Table 4. Number and percentage of undersized (less than 15 1/2 inches total length) yellow pikeperch from Saginaw Bay that produced legal-sized fillets and number and percentage of legal-sized fish that produced undersized fillets at five assumed minimum legal fillet weights, November 1942 and May 1943

| Assumed minimum legal fillet weight (ounces) | Total length (inches) | November 1942 | | | | | May 1943 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total number of fish in group | Undersized fish producing legal-sized fillets | | Legal-sized fish producing undersized fillets | | Total number of fish in group | Undersized fish producing legal-sized fillets | | Legal-sized fish producing undersized fillets | |
| | | | Number | Percentage | Number | Percentage | | Number | Percentage | Number | Percentage |
| 10 | 14 3/4 | 21 | ... | 0.0 | ... | ... | 24 | ... | 0.0 | ... | ... |
| | 15 | 19 | ... | 0.0 | ... | ... | 27 | ... | 0.0 | ... | ... |
| | 15 1/4 | 19 | 3 | 15.8 | ... | ... | 19 | ... | 0.0 | ... | ... |
| | 15 1/2 | 16 | ... | ... | 6 | 37.5 | 18 | ... | ... | 16 | 88.9 |
| | 15 3/4 | 20 | ... | ... | 3 | 15.0 | 10 | ... | ... | 8 | 80.0 |
| | 16 | 17 | ... | ... | 2 | 11.8 | 13 | ... | ... | 4 | 30.8 |
| | 16 1/4 | 17 | ... | ... | 3 | 17.6 | 15 | ... | ... | 2 | 13.3 |
| | Total or average | | 3 | 5.3 | 14 | 20.5 | ... | ... | 0.0 | 30 | 53.2 |
| 9 3/4 | 14 3/4 | 21 | ... | 0.0 | ... | ... | 24 | ... | 0.0 | ... | ... |
| | 15 | 19 | ... | 0.0 | ... | ... | 27 | ... | 0.0 | ... | ... |
| | 15 1/4 | 19 | 4 | 21.1 | ... | ... | 19 | 1 | 5.3 | ... | ... |
| | 15 1/2 | 16 | ... | ... | 4 | 25.0 | 18 | ... | ... | 15 | 83.3 |
| | 15 3/4 | 20 | ... | ... | 2 | 10.0 | 10 | ... | ... | 6 | 60.0 |
| | 16 | 17 | ... | ... | 2 | 11.8 | 13 | ... | ... | 1 | 7.7 |
| | 16 1/4 | 17 | ... | ... | 2 | 11.8 | 15 | ... | ... | 1 | 6.7 |
| | Total or average | | 4 | 7.0 | 10 | 14.6 | ... | 1 | 1.8 | 23 | 39.4 |
| 9 1/2 | 14 3/4 | 21 | 1 | 4.8 | ... | ... | 24 | ... | 0.0 | ... | ... |
| | 15 | 19 | 3 | 15.8 | ... | ... | 27 | ... | 0.0 | ... | ... |
| | 15 1/4 | 19 | 6 | 31.6 | ... | ... | 19 | 3 | 15.8 | ... | ... |
| | 15 1/2 | 16 | ... | ... | 3 | 18.8 | 18 | ... | ... | 12 | 66.7 |
| | 15 3/4 | 20 | ... | ... | 1 | 5.0 | 10 | ... | ... | 3 | 30.0 |
| | 16 | 17 | ... | ... | 1 | 5.9 | 13 | ... | ... | 1 | 7.7 |
| | 16 1/4 | 17 | ... | ... | 1 | 5.9 | 15 | ... | ... | 1 | 6.7 |
| | Total or average | | 10 | 17.4 | 6 | 8.9 | ... | 3 | 5.3 | 17 | 27.8 |
| 9 1/4 | 14 3/4 | 21 | 1 | 4.8 | ... | ... | 24 | ... | 0.0 | ... | ... |
| | 15 | 19 | 4 | 21.1 | ... | ... | 27 | ... | 0.0 | ... | ... |
| | 15 1/4 | 19 | 8 | 42.1 | ... | ... | 19 | 5 | 26.3 | ... | ... |
| | 15 1/2 | 16 | ... | ... | 3 | 18.8 | 18 | ... | ... | 8 | 44.4 |
| | 15 3/4 | 20 | ... | ... | 1 | 5.0 | 10 | ... | ... | 2 | 20.0 |
| | 16 | 17 | ... | ... | ... | 0.0 | 13 | ... | ... | 1 | 7.7 |
| | 16 1/4 | 17 | ... | ... | 1 | 5.9 | 15 | ... | ... | 1 | 6.7 |
| | Total or average | | 13 | 22.7 | 5 | 6.7 | ... | 5 | 8.8 | 12 | 19.7 |
| 9 | 14 3/4 | 21 | 3 | 14.3 | ... | ... | 24 | ... | 0.0 | ... | ... |
| | 15 | 19 | 8 | 42.1 | ... | ... | 27 | 1 | 3.7 | ... | ... |
| | 15 1/4 | 19 | 12 | 63.1 | ... | ... | 19 | 6 | 31.6 | ... | ... |
| | 15 1/2 | 16 | ... | ... | 2 | 12.5 | 18 | ... | ... | 7 | 38.9 |
| | 15 3/4 | 20 | ... | ... | ... | ... | 10 | ... | ... | ... | ... |
| | 16 | 17 | ... | ... | ... | ... | 13 | ... | ... | ... | ... |
| | 16 1/4 | 17 | ... | ... | ... | ... | 15 | ... | ... | ... | ... |
| | Total or average | | 23 | 39.8 | 2 | 3.1 | ... | 7 | 11.8 | ... | 9.7 |

This 9-ounce limit applies to double fillets (that is fillets from both sides of the fish connected by a strip of flesh). For single fillets the limit should be 4 1/2 ounces.

The major criticism of a 9-ounce minimum weight limit for fillets of yellow pikeperch lies in the fact that roughly 40 per cent of the undersized fish in the length groups, 14 3/4 - 15 1/4 inches, in the November samples produced fillets of legal weight. It may be pointed out again, however, that on the average only 11 per cent of the annual catch is taken in the fall fishery as compared with 85 per cent produced in the spring. Furthermore, more than half (12 of 23) of the undersized yellow pikeperch of the November collection that yielded legal-sized fillets occurred in the quarter-inch length group (15 1/4 inches) immediately below 15 1/2 inches. It appears unlikely, therefore, that the filleting of undersized yellow pikeperch in the fall fishery would be the source of major inroads on the stock of individuals below legal length.

A further argument for the 9-ounce as against a higher weight limit for yellow pikeperch fillets lies in the possibility that processors may find it necessary to provide a margin to cover possible loss of weight of fillets during freezing and storage. Inasmuch as some loss of weight may occur subsequent to the original filleting, the weight limit, to be effective, must be specified as applicable to fillets at the time of any inspection regardless of their previous history.

## Loss of weight due to filleting

The percentage loss of weight of yellow pikeperch of Saginaw Bay at filleting (Table 5) did not vary widely either with season or size of fish. The variations that did occur were consistent in that the percentage loss was higher for undersized than for legal-sized fish in both seasons and was higher in May than in November for both size groups. All the percentages were so close to 50 that for practical purposes it may be said

Table 5. Percentage loss of weight due to filleting of Saginaw Bay yellow pikeperch according to size and season of capture. Numbers of fish in parentheses.

| Size group | November 1942 | May 1943 | Combined samples |
|---|---|---|---|
| Undersized (13-15 1/4 inches) | 49.8 (129) | 51.4 (156) | 50.7 (285) |
| Legal-sized (15 1/2-17 inches) | 49.6 (110) | 50.6 (101) | 50.1 (211) |
| All sizes (13-17 inches) | 49.7 (239) | 51.1 (257) | 50.4 (496) |

that Saginaw Bay yellow pikeperch at the time of the present investigation and over the range of sizes studied lost half their weight on filleting.

No records are available of other experimental studies on the filleting of yellow pikeperch. A percentage that may be roughly comparable to the figures of Table 5 was given by Atwater (1892) who, in the course of his investigations on the chemical composition of fish, determined that the refuse (entrails, bones, skin, etc.) amounted to 58.8 per cent of the round weight of two yellow pikeperch. The fish weighed 1 pound, 5.6 ounces (611.5 grams) and 1 pound, 2.0 ounces (511.2 grams); their origin was not stated.

Statements, not accompanied by data, in the typewritten report of The Red Lakes Fisheries Association (Minnesota) for 1938 and in The Great Lakes Fisherman for April 1937 gave the loss of weight of yellow pikeperch due to filleting as 58 and 60 per cent respectively (the latter figure referred to spring-run fish from Saginaw Bay). Both percentages are above those determined in the present study.

Fishermen interviewed at Bay Port believed that Saginaw Bay yellow pikeperch lose approximately 50 per cent of their weight on filleting in the fall and 60 per cent in the spring. The former estimate agrees closely with the findings in this study but the latter percentage is higher. It is probable, however, that a higher percentage loss would have been found by us in the spring samples had the experiment been conducted earlier (in April) during the period of most active spawning and had larger fish been included in the samples. The greatest loss at filleting may be expected among ripe females, and yellow pikeperch of that sex are seldom mature at 17 inches, total length, or less.

Subsequent to the investigation of fillet weights at Saginaw Bay in November 1942 and May 1943, Dr. Hile has pointed out that the fish handled during the investigation were considerably heavier for their length than yellow pikeperch taken in the spring runs of 1928, 1929, and 1930. Furthermore, since there is some question as to the loss of weight of yellow pikeperch fillets due to storage (freezing of fillets during the heavy spring run and subsequent marketing during the months when the catch is very low), it is recommended that a third trip be made to Saginaw Bay in April 1944 when the spawning activity of the yellow pikeperch is highest to obtain further information.

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