

MAINE STATE LEGISLATURE

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Public Documents of Maine:

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

PUBLIC OFFICERS AND INSTITUTIONS

FOR THE YEAR

1878.

VOLUME I.

AUGUSTA:

SPRAGUE, OWEN & NASH, PRINTERS TO THE STATE.

1878.

ELEVENTH REPORT

OF THE

COMMISSIONERS OF FISHERIES

OF THE

STATE OF MAINE,

FOR THE YEAR

1877.



AUGUSTA :

SPRAGUE, OWEN & NASH, PRINTERS TO THE STATE.

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REPORT.

To the Honorable the Governor and Executive Council:

It affords your Commissioners of Fisheries great satisfaction to be able to report marked success in their operations, in that branch of public service committed to their charge. The salmon fisheries of the State have been largely productive, that of the Penobscot being reported as greater than for the last twenty-five years. The take of alewives in those sections of the State where fishways have been provided, and the fish protected, was likewise very large and remunerative. The new fishway designed by Mr. Atkins, and put in at Warren, worked admirably, and the alewife fishery of that town constitutes an important element in the industry and economy of the locality. The most gratifying feature of the year's experience, is the wide interest awakened in the State in fish culture among all classes, as evidenced in the extensive demand for Brook Trout, Land-locked Salmon and Black Bass, to stock waters for private enterprises, as well as for towns and counties. It is with great difficulty we are enabled, with our cramped means and resources, to comply with a tithe of the demands made upon us. Not only are the means necessary to provide for these different applicants, but time as well, to examine each case, to see that species conflicting with each other's existence, should not be introduced into the same waters. The black bass we apply in all cases as an antidote to the worthless pickerel. It costs more to feed a pickerel than any other fish; it costs more to make a pound of pickerel than a pound of any other fish. The pickerel consumes everything that swims, or that they can swallow. They are very destructive to young water fowl. A better or

more savory fish than the black bass, is rarely found. They attain to as great weight in our State as the pickerel, grow more rapidly, and are more easily bred than the trout. But it is necessary for their protection, as well as our other fishes, that a rigid and severe law should be passed against all netting in our fresh water lakes, ponds and streams. Heavy fines and imprisonment, with certainty of their infliction, should be the penalty. As the great mass of the people are ignorant of the habits of fishes, it may be well here to state, that in all cases where salmon, either fresh water or ocean, or trout, are required to stock waters, it is necessary that the means be provided us the year before they are to be delivered, as these fishes all spawn in October and November, and it requires the whole winter to hatch them preparatory to distributing them in the spring of the following year. For instance, in 1874 we appropriated one thousand dollars of our fund for that year, to the Bucksport Salmon Breeding Works for salmon fry to be used in May, 1875. If it is the design of the people of the State that we continue to supply our depleted rivers with salmon, or to introduce the Sebago salmon into the immense waste of unproductive waters in Kennebec and other counties, then will it be necessary to provide the means by which we are to obtain the fish, for all the salmonidæ are obtained by the same means, and require the same time to hatch. There is no market into which we can go and purchase the fry of these fishes, or their eggs, when we receive applications for them. To the generosity of Prof. Baird, the U. S. Commissioner of Fisheries, have we hitherto been indebted for most of our supply of land-locked salmon. We have taken a few thousand ova ourselves, but it is much better and more economical for us to unite with the United States Government, and our sister States, as the united effort gives a greater product at less cost. In presence of the fact that Maine is the source of supply of this paragon of fishes for the whole country, your Commissioners are not able, for want of means, to procure a supply for the demands of our own citizens. Prof. Baird informs us that the demands

upon him through members of Congress for ova of these fishes, is very great from all parts of the country. All applicants for permits to take the eggs of our fishes from our waters, are required to put back the parent fish alive, and 25 per cent. of the product of the hatched ova, into the waters whence taken, as it is our object to increase the stock of the waters whence the supply is drawn. To require more than this would not only be extortionate and unreasonable, but have the effect of checking applications. It should be borne in mind, that the eggs are ready to transport in about forty days after being taken, while to be hatched it requires at least ninety days, during which time the continued attendance of a man is requisite. We were not able this year to take any ova at Sebago Lake for ourselves, or to subscribe to the operations at Grand Lake. The Hon. Harvey Jewell has kindly volunteered to sell us a few thousand fry next spring, and we are promised a few thousand from the Works of the associated States at Grand Lake stream. The orders for black bass should be sent in to us as early as possible during the winter, that we may be able to put them on file, and make arrangements for their capture in the spring. Now that the inland fisheries of Maine have become so valuable a resource of the State, so important an item in the receipts of our routes of travel, our hotels and all places of summer resort, it is time that this crop should be fostered and increased, rather than left to the mercy of the worst class of our population. We will take Moosehead Lake as a case in point, to explain what is required. How important is Moosehead Lake to our railroads and stages; how important to the very existence of the hotels in Greenville and Kineo, needs no comment. A law was passed during the life of the late Mr. Chenery, in the interest of the Kineo House, permitting trout fishing in Moosehead Lake until the 15th of October, when every tyro knows that at that period the trout are crowding to their spawning beds, on sand bars or in brooks and streams. This law was repealed by the general law of 1876. Last summer a party of men from Dexter, took 800 lbs. of trout by means

of nets, from Spencer Bay, a favorite fishing ground of visitors to Moosehead Lake. No one was found to enforce the law. There is no warden in that district, for no one dare take the office, for fear of loss of trade, or having their property burned, or their stock destroyed. Last winter, during the close-time for trout in this State, fresh trout from Maine were advertised for sale in a small town in Connecticut. We traced those trout back from Connecticut to the time they were delivered to one of the expressmen or stage drivers at Greenville. And no one dare perform the duties of fish-warden at Moosehead Lake. Is it worth while for the State to waste her resources to stock Moosehead Lake with Rangely trout, or land-locked salmon, or blue-backed trout, when the people of the locality will make no effort themselves? Fancy for one moment Moosehead depleted of her trout! Ask your railroad men and your stage drivers and your hotel keepers at Kineo and Greenville. We require a good square law for the whole State, that from the first of October until the first day of February, or March, or April, or May, just as the Legislature in its wisdom shall decide, there shall be no fishing of any kind whatever in any of our fresh water lakes, ponds and streams, and that possession during that period, whether on hotel or private table, or *in transitu* by carriers, shall be considered evidence of guilt, without regard to place where caught. Let netting, or spearing, or grappling, or catching in traps, be constituted a serious offence, punishable with both fine and imprisonment. Expressmen and carriers *can* know what freight they carry if they *please*; make them responsible. It is not the fish that are caught to eat, that is depleting our inland water. It is the fish that are caught to sell! Massachusetts does more to protect our fish during close-time, than Maine can do. The following from the "Boston Journal," sent *us from our friend Dr. John P. Ordway, will, we trust, illustrate our point:

LAND-LOCKED SALMON. Dr. John P. Ordway, President of the Massachusetts Fish and Game Protective Association, on Friday caused warrants to be served on John Bacon, M. A. Snell, Henry Snow and Levi Perkins,

for each having in possession one land-locked salmon. The warrants were served by officer Cain, and this morning, before Judge Chamberlain, they all pleaded guilty and were fined \$10 each without costs, it being their first offence. Our Fish Commissioners have at a large expense stocked our own waters with these fish, and the above association proposes to see that all violators of the law are punished. The close-time is from the 1st of October in each year to the following 1st of April. These fish came from Ellsworth, Me., where the close-time is similar to our own, and had, by the large gashes in their sides, been evidently speared on their spawning beds.

Will Connecticut and Maine follow so good an example of judicious, common sense legislation? And how of our friends in the Dominion of Canada? Eight barrels of trout were seized at the express office in Bangor, during our close-time for trout, and were released upon proof that they were caught in New Brunswick. Twice in our previous reports have we appealed to the Legislature that a law be passed to prevent the introduction and sale in our State of fish that our laws forbid to be either caught or sold here, during certain months called close months. They are caught in violation of the laws of the States where they are captured, and sold here, and *vice versa*. It leads to much perjury and crime, makes it very difficult to effectively execute our laws, and in a sanitary light, allows fish to be sold here as food, that our own physicians have condemned as directly productive of disease. We hope that the legislatures of other States may be induced to unite with us in passing laws that will put an end to this criminal traffic.

SALMON.

For the last four or five years, large numbers of young salmon have made their appearance in the Penobscot river at and above Bangor. Even the Kenduskeag river, below Morse & Co.'s mill, has been full of them. Large numbers have been taken this year below the dam of the Holly Water Works at Treat's Falls, and at Burr's brook, by both men and boys. In dipping for smelts at Brewer, sixty young salmon were picked from among the captured smelts in the course of two hours, and turned back into the water. They

were recognized by an intelligent by-stander, and their distinctive marks pointed out, when all parties took a deep interest in protecting them. One man, in fishing for suckers in the Kenduskeag, with coarse line and baited hook sunk on the bottom, caught sixteen young salmon in two hours, and carefully returned them to the water again. The wharves, and almost every available position, was occupied at the incoming tide, by men and boys, fishing, and the number of young salmon destroyed was very large, as their eagerness for bait or fly renders them an easy prey, and the boys are not very discriminating as to the kind of fish they catch. The gentlemen connected with Morse & Co.'s mills, used every effort to aid us in protecting the young salmon. Of their destruction in the river below the city, we subjoin a paragraph cut from the Bangor Commercial :

SALMON ABUNDANT. On visiting his weir yesterday in Marsh river, Mr. Reuben Hopkins found 140 young salmon in it, varying in length from eight inches to one foot. He turned them all loose in the river. We learn that these young salmon are found in all the weirs on the river in large numbers.

When it is borne in mind that these young salmon must remain in the brackish water near the head of tide for a length of time, and gradually become accustomed to the change, before going down to the ocean; that the erection of dams at the head of tide compels them to go below the dam, and thus concentrates their immense numbers in circumscribed space, the urgent necessity of a law for their protection will at once become obvious to the most unthinking. The same acclimating necessity applies to the ascending salmon, making their way from ocean to spawning bed, in the fresh water rivers far above the influence of tide water. That we may the more readily be understood, we quote the following from the Scientific American :

“It is well known that fresh water fish cannot live in salt water, and *vice versa*, and it has been supposed that the reason existed in some poisonous effect which the inappropriate water exerted. M. Paul Bert has recently been investigating this subject, and his conclusion is that the death of the creature is not due to any toxic action, but is simply a phenomenon

of osmosis or transmission of fluids through the membranes. In order to prove this it is only necessary to weigh the animal before and after the experiment. A frog, for example, plunged in sea-water loses one-third its weight. If only the foot of the frog be introduced the blood globules can be seen to leave the vessels and distribute themselves under the skin. If an animal be taken, the skin of which is not entirely osmotic, the same phenomena occur in the bronchial system.

There are certain fish, however, which exist sometimes in salt, sometimes in fresh water, changing their habitat in different periods of life or of the year. It, therefore, in view of the above, becomes interesting to see how M. Bert applies his discovery to such apparent exceptions to the general rule. A fresh water salmon, for instance, plunged abruptly in sea-water resists the effects longer than any other fresh water fishes; but he dies within five or six hours. This shows, according to M. Bert, that the fish never proceed suddenly from fresh to salt water, but enter brackish water where the tide ebbs and flows, and live there a sufficient time to habituate themselves to the change. This accounts for the frequent discovery of large numbers of such migratory fish in the vicinity of the mouths of the rivers which they ascend.

The converse experiment of inserting sea fish in fresh water produced analogous results. The gills were the seat of alterations, the same as those noted in fresh water fish placed in salt water. M. Bert also observed that the life of the sea fish could be prolonged by adding salt to the fresh water, thus adding further confirmation to his theory."

These young salmon seemed to be present in considerable numbers, both above and below the dam in mid winter, and were taken occasionally in the nets of fishers for tomcod below the falls. We have in our office a specimen taken in the latter part of winter, that was crowded out upon the ice at the incoming of the tide; we have also a specimen taken in the spring, when the ice had all gone out. The former would be called at this stage a *parr*; has not yet assumed much of the silvery garb, has nine distinct bars on the sides, and is between five and six inches long. The other is about seven inches long, the bars almost entirely faded out, and can be perceived only by changing the point of vision as in changeable silk; is bright and silvery on the belly and lower part of the sides, with a few black spots above, with darker hue on the back.

The salmon fishery of the Penobscot is estimated to be the largest for many years; so much beyond the product of years

past, as to leave no doubt in the minds of the most incredulous, that the work of restoration by planting and protection, is an entire and unmistakable success. Many of the salmon were of very large size. Of one of the large fishes, the following paragraph cut from the Belfast Journal will be read with interest, as conveying some important facts in relation to their growth and habits :

SALMON. In our issue of May 3d, we made mention of a very large salmon caught at Cape Jellison, Stockton, by Josiah Parsons and purchased by Frank Collins of this city. The fish measured fifty inches in length and weighed thirty-three and a half pounds. Attached to the fish was a metallic tag numbered "1019," indicating that it was one liberated from the Bucksport Breeding Works. The tag was forwarded to Mr. Atkins, the superintendent of the works, who keeps a record of all fish used for spawning purposes and liberated. We now chronicle the record of the fish, as learned from a letter from Mr. Atkins to Mr. Collins. He writes that the salmon was liberated at Bucksport, Nov. 10, 1875. It was a female fish, thirty-nine and a half inches in length and yielded five pounds and six ounces of spawn, or about 16,000 eggs. After spawning, it weighed sixteen pounds. He judges that in the preceding May, (1875) the fish weighed twenty-five pounds. Thus the fish in two years had grown nearly an additional foot in length and eight and a half pounds in weight. One important fact in the habits of the salmon has been demonstrated by the use of these tags, and that is, that the fish, after it becomes large, does not visit the river every year, as was formerly supposed, but only every second year. Those liberated in the Penobscot in 1873, were recaptured in 1875, and those let loose in 1875 are now being caught. One dollar premium is paid for every tag thus found. The Penobscot river about Bangor is reported to be full of young salmon.

Among others of the large fishes, one was taken at Veazie by Mr. Albert Spencer, weighing 38 lbs. The fish presented by our worthy Mayor, Dr. A. C. Hamlin, to Mayor Prince of Boston, and which was captured at Sandy Point, on the Penobscot, was said to have weighed 40 lbs. when first taken. Not so many fish as usual were taken on the old fishing grounds above the dam, as the setting back of the water had made an easy run for the fish when they had passed the fishway, and they did not lay by to rest, until they had ascended some distance above their old haunts. A great revolution was likewise created by increased depths of water on old favorite drifting ground, as the fish no longer resorted to

their old stopping places. Terrible slaughter of the fish took place below the dam, as the salmon were bewildered by being stopped by a twenty foot dam, where they hitherto had had a clear course. Those fish that went up the river on the Brewer or easterly side, readily found their way by feeling along for an opening from the sluice-way which divides the dam in the centre, and extends down the channel of the river some hundreds of feet to the fishway on the Brewer shore, where by means of the current of water through the fishway, which finds its outlet close to the dam, they readily made their way over the obstruction, and were soon quietly swimming in smooth still water. The eagerness and avidity of the fishermen seemed to increase with the number caught. The continued vigilance of wardens Kelly of Orono, and Green of Brewer, was scarce able to restrain the lawlessness of the fishermen. We are deeply indebted to Mayor Hamlin for affording us the aid of a special policeman, to assist in preventing the utter destruction of every fish that ascended to the dam. No regard was paid to the law of close-time, and a night as well as day watch was necessary whenever the tide served for fishing.* We have stated that the dam is divided in the centre by a long sluice for rafting purposes, extending down into the channel of the river. This divides the water below the dam into two basins, east and west. The fish on the west or Bangor side, ascend as far as the obstruction of the dam; they then feel their way along, hunting for a current through, until they are stopped by the sluice; they then turn and feel their way back, until they arrive at the canal that empties from beneath the Holly Works, where they may at times be seen crowded up, and indicating by their dark color, that they had lain there some time. Salmon fresh run from the ocean are light in color, and gradually deepen in hue from the influence of the fresh water. Next

* It may be worthy of notice that some of the most prominent in lawlessness, so soon as the salmon ceased to run, transferred their pursuit to the hunting of Deer, before the first of October, the earliest period at which they can be legally hunted, and with dogs, which is forbidden by law at all times.

year the fish will be less checked here, and will find their way more directly over. We think the judicious alterations in the dam by lengthening down the apron, and thus lessening the undertow, will allow very many fish to pass over the dam at high tide, independent of the fishway. As we are frequently asked the question, how high can a salmon jump? we quote the following, in reply, from the work of Hon. M. H. Perley: "Salmon swim with great rapidity, shoot up the most oblique and glancing falls with the velocity of an arrow, and frequently leap falls of ten or twelve feet in height. It is believed that the utmost limit of perpendicular height which a salmon can attain in leaping is fourteen feet."

A very good run of salmon has visited the St. Croix the last year. In 1873, some thousands of young salmon were planted by us in the St. Croix at Vanceboro'. In 1874, fifty thousand fry were hatched and turned into Dobsis stream for us, by the courtesy of the Hon. Harvey Jewell, of the Dobsis Club. The inference is but fair, that these contributions to the stock of the river, had a marked influence in adding to the number that constituted the good run of this year. We owe much to the influence of the Washington County Game and Fish Protection Association, in enforcing the laws, creating a healthy public opinion, and giving us an effective live Warden in the person of Mr. Benjamin Wyatt.

Of the salmon fry planted in the Medomac river at Waldoboro', we have the following pleasant and encouraging letter from our esteemed friend, Dr. Everleth:

WALDOBORO'. Nov. 5, 1877.

MR. STILWELL—*Dear Sir*: Our fishways have worked admirably, requiring no attention whatever. Alewives were able to ascend at any pitch of water. They passed up in increased numbers and millions of small ones have gone down. The old ones remained in fresh water this season much longer than we have observed them to do before; some of them being seen going down in August.

Full grown salmon have been seen in the river this season, the first time for forty years. They were in the mill-pond above the second dam, over which they must have passed, or through the fishways. The water has been so low that they could not have gone over the falls. And this, I fear,

will be the trouble with salmon in this stream; there will not be sufficient water for them to pass all obstructions after the middle of June till September.

Will there be any salmon eggs for us this season?

Yours truly,

F. M. EVERLETH.

A very large number of salmon fry have been turned into the Androscoggin river, at and above Dixfield, and with proper facilities of ascent over the dams at Brunswick, the river should be full the coming spring of 1878, of well grown salmon. The lower fishway at Brunswick is entirely inadequate to its requirements and position. It was not built in accordance with the design and plan given by Mr. Atkins, the engineer. A new one, or some important alterations in the present, will be required next spring or summer. We make no apology for introducing the following letter from Mr. George Gifford, as giving an intelligent view of the whole state of affairs on the Androscoggin :

AUBURN, Maine, Nov. 19, 1877.

Sir :—In reply to your letter of inquiry, I can say but little, as during the time for salmon to ascend the streams, I was in another section. What little I have been able to learn, is at your disposal.

The season, as you know, was extremely unfavorable; for during the entire period for salmon to ascend the streams the water was very low, so low that for weeks people walked on the rocks of the falls at Lewiston, from the Auburn side to the Lewiston mills dry shod.

At Brunswick, of course the same state of things prevailed, except that in the night, or rather for an hour or two in the early morning, there would occasionally be sufficient water to enable the fish to go up the fishway, had it been kept clear; but at two different times of my own knowledge, and for nearly the whole season, as I am told by others, the entrance was so filled with drift as to nearly or quite exclude the water from the ladder.

Thus, while the fish might possibly pass Brunswick, they could not pass Lewiston, by reason of low water; and with a medium flow of water the restocking of the Androscoggin, and a part of its tributaries, would have been an established fact, without doubt. The recent transfer of the right to control the surplus water in the lakes at the head waters of the Androscoggin, by the city of Lewiston, and the company owning the water power at that place, will greatly aid your efforts in this river, by making the flow of water constant, thus obviating difficulty from drought, which is undoubtedly the real difficulty in the way.

Another great obstacle in the way of adding to the wealth of the State, is the shortsightedness of the people who would be most benefitted. Their idea is, that they are to be taxed to the sole end that a few "city gentry," as they express it, may go out and catch the fish. Those living on the streams which were once salmon streams (and most of the streams draining into the different river systems which were not salmon streams originally, could be stocked as readily as any, for natural obstacles can be overcome as readily as artificial ones, as was proved years ago in England), which if restocked would enable them to take from them one of the most valuable food fishes, don't seem to think that it would enhance the value of their lands, or add to its food sources. Any man owning land adjoining good salmon fishing, could lease his fishing privileges alone for a handsome sum, as is regularly done where such fishing is to be found. The Canadian Government derives a large yearly revenue from the sale of fishing privileges in almost uninhabitable parts of its wild lands.

As an instance of what value is to be placed upon these matters, the Rangely lakes may be mentioned. The travel to this region is large enough to cause the different railroad lines to make special arrangements for its accommodation; to fill forty or more hotels, and camps by the hundred, which are kept open during the fishing season only; building up several villages; gives employment to many, who, if dependent on the ordinary means would be obliged to become semi-barbarous or leave the region; and it leaves a trail of money from the time it enters the State till its departure; and whatever brings money into the State adds to its wealth.

I remain yours truly,

GEO. GIFFORD, Auburn, Me.

HON. E. M. STILWELL, Bangor.

The Penobscot Salmon Breeding Works at Bucksport have not been in operation this year. The lateness of the appropriations at Washington, for the U. S. Department of Fish and Fisheries, of which Prof. Baird of the Smithsonian Institution is the Chief or Commissioner, did not admit of the usual contribution from that source, while the subscription from other States was not sufficient without that of Maine, for the expenses of the establishment. The Commissioners of Maine could not contribute for want of adequate means. In consequence we shall have no salmon fry or eggs to distribute the ensuing year. We are informed by Prof. Baird and the Commissioners of Massachusetts, Vermont, New Hampshire and Connecticut, that it is in contemplation to resume operations at Bucksport the coming year. We hope

we may have it in our power to co-operate with the U. S. Government and our sister States' Commissioners, both at Bucksport for sea salmon, and at Grand Lake and Songo Lock, for land-locked salmon.

SALMO GLOVERI, OR SALMO SEBAGO.

The miscalled land-locked salmon of Maine, varies as much in size in the different lakes of the State in which it is found, as do our brook trout. A large range of water, as well as its purity and coldness, seems to have as great an influence upon their size, as does the amount and variety of their feed. The young Rangely trout is in reality larger at its birth than is the ordinary brook trout in other sections of the State. There is the same difference in the size of the land-locked salmon from Reed's pond and Sebago lake, and the same fishes as bred in Sebec and Grand and Schoodic waters. Extensive and pure waters with abundant feed, has caused as distinct characteristics and marks of breeding as between the huge Hereford and Durham cattle, and the little dwarf cattle of Derry, in Ireland. We sincerely hope the inhabitants living on the tributaries of Sebago lake, will unite with us in our endeavors to preserve and increase the stock of these fine fish in those waters. A wretched custom of taking these fish on their spawning beds, seems to have existed from time immemorial. Indeed, no other method appears to have been known or recognized. It is apparently a remnant of barbarism, perhaps copied by early settlers from the Indians. That one can eat fish in the breeding season, is indicative of an indiscriminating appetite, worthy of a Digger Indian, who varies his bill of fare with an occasional relish of bugs, worms, spiders, snakes and grasshoppers. The yellow perch is not eaten at Sebago, because in spring, which is its breeding season, its flesh, particularly around the fins, is full of worms. The same is the case with the Sebago salmon in the breeding season; indeed, with most all fishes. The yellow perch is a very fine, edible fish at the proper season. We hope in another year to induce the U. S. Commissioner of

Fisheries, to establish a Spawning and Hatching Works at Songo Lock. We shall thus be enabled to add to the stock of the waters, and by means of the intelligent and scientific gentlemen who will have the superintendence and charge, to afford much valuable information and opportunities of observation and study, to such of the local residents as wish to avail themselves of the means.

We were much disappointed in our anticipated supply of eggs and fry of this fine fish for distribution in our State this year. We obtained four thousand eggs, by begging from Prof. Baird, which were sent to Mr. Whitman of Pembroke, who hatched and distributed them in waters in his locality, and a like number for Dr. Frank Innis of Houlton, who kindly did the same service for waters in his vicinity. We were promised some fry from Dobsis, by Hon. Harvey Jewell, but owing to some mishap with the fry, they were never delivered; these latter were intended for a pond in Lincoln. We took a few thousand ova at Songo Lock, under charge of Mr. Dillingham, which were distributed in Webb's pond in Franklin County, ten thousand; Cobbosseecontee lake three thousand; Whitney pond in Canton three thousand; Rangely lake eighteen thousand. All the Rangely lakes, Moosehead lake, all the line of lakes emptying into the Kennebec above and below Augusta, should be stocked with these fish. Rangely, through its fine Club of public spirited gentlemen, has set the example of providing a good hatching house. Why cannot a club be organized at Moosehead lake? Are there any finer sites for pretty summer cottages in the country than on Moosehead lake? If the inhabitants of the locality are deserving of State aid in restocking their lake, they will build a hatching house. A few thousand eggs of the Sebago salmon, a few thousand eggs of the Rangely trout, hatched and turned into those waters, would make Moosehead lake the most popular place of summer resort in the United States. It is to be hoped that hatching houses will be established at Dexter, and Belgrade and China, and all places where there are waters to be stocked. To transport the hatched fry is

both costly and hazardous, and limits the supply. To stock waters well with the salmonidæ, which includes the brook trout, the fry should be supplied by thousands, which can be only done by hatching the eggs on the spot.

BLACK BASS.

The demand for black bass has steadily increased from year to year. So comparatively new a State as Maine, with such a vast wilderness of unsettled lands, abounding with such chains of lakes, ponds and streams, it seems almost incredible the havoc that has been created in her waters by the pickerel, and the practice of spearing, netting and capturing on the spawning bed for market. The applications now are mostly to stock depleted waters, or waters where there is little else left but pickerel and yellow perch and breme. We know of sheets of water in our State, once abounding in trout that would compete in size with those of Rangely, and where there has been but little or no angling with hook or line, that now contain no fish but breme and eels and pout. This has been caused entirely by killing the trout when on the spawning bed. Every trout will be found in October and November on the sand bars of the pond, or in the shallow water of gravelly bottoms of tributary brooks or outlets. This mode of destroying fish must be prohibited by a law so severe that one infliction under it will effectually deter the criminal and accessories from ever again repeating the offence. We have before stated, that it is not the game and fish of the State that is killed for food by the consumer that depletes the forest and stream, but it is what is killed to sell. The people of Maine pay their taxes, pay all the expenses of her game and fish protection and legislation, and when their crop of game and fish is ready to harvest, men from other States come in and harvest, and carry off and sell the crops for profit. Men from abroad come into our woods, and in violation of our laws, hunt our deer with packs of hounds, while they feed on our fish, caught both by net, spear and trap. What can

be done to abate this nuisance? Our own people should be allowed, under proper restrictions of close-time for the breeding season, to kill for their own consumption; but no one person should be allowed to kill and sell for his own profit, that which equally belongs to all. To kill for one's own food may be right, but to kill to sell is invading the rights of others. Killing fish during the breeding season, killing by unlawful means for sale, has depleted our inland waters. The Legislature has the power, we look to them to supply the remedy. The pickerel has done much damage, but the most destruction has been by the pot hunters of this and other States. If our game is worth preserving and legislation, it is worth being paid for to our State by citizens of other States, who come here to kill and sell, for they contribute nothing to the taxes of our State.

By the active kindness and energy of Mr. Caleb Gilman of Meddybemps, we have been able to stock Meddybemps lake with black bass. Postal clerk Haynes, took whole charge of the fish to Vanceboro', and delivered them to Mr. Gilman, who consigned them to Meddybemps lake the same night, without the loss of a fish. To them is the whole credit due; for on the assigned day to meet Mr. Gilman, we were summoned by telegraph to meet two gentlemen in charge of 80,000 shad fry, presented by Prof. Baird, the U. S. Commissioner of Fisheries to the State of Maine, and accompany them to Mattawamkeag, where we turned the young fish into the Mattawamkeag river. To Messrs. W. F. Works and Ezra Jameson, are we indebted for success in getting twenty bass into Lacoot pond in Vanceboro'. As the cars stop but twenty minutes at the latter place, without the aid of these gentlemen we could not have got the fish into the pond to which they were assigned, without being delayed a whole day. Two cans containing twenty bass were consigned to the Hon. Secretary of State, Sumner J. Chadbourne, for Mr. Pillsbury, who placed them in Sidney pond near Vassalboro'. Forty bass, to the care of C. Hazeltine, Esq., were consigned to Belfast. Twenty bass were delivered to the charge of Hon.

Amos E. Hardy, who put them into Hermon pond. Twenty bass, in charge of Postal clerks Cochrane and Buck, were sent to Hon. S. P. Brown of Dover, and by those gentlemen the same day safely consigned to the waters of Little Bear pond. At request of Fred Atwood, Esq., twenty bass were sent to Winterport, for a pond in that vicinity. Twenty bass were delivered to L. E. Boyd, Esq., and safely transported to Half Moon pond in No. Searsport. At request of citizens of Mattawamkeag, twenty bass were delivered at that place and transported to Madaceunk lake, a beautiful sheet of water abounding in white perch and pickerel, and trout in its tributaries. Goose pond and Reed's pond, in Dedham, each received a consignment of twenty bass, on application of Robert Johnson, Esq., of the Dedham House. H. H. Bowles of Cherryfield, received twenty bass for local waters. Many were consigned to gentlemen for private enterprizes, they paying for them to Mr. Phillips of the Lake House, who caught them to their order. From Cobbosseecontee pond, in Kennebec County, and Duck pond in Cumberland County, we have delivered thirteen bass at Thompson pond in Oxford, twenty-four at Pennessewassee pond in Norway, twelve at North pond in Greenwood. To Ferguson Haynes, Esq., at Biddeford, twenty bass. To Rufus Prince, Esq., for two ponds in Turner, forty; Songo pond in Bethel, twenty-five; Woodbury pond in Litchfield, sixteen; Sand pond in Litchfield, eighteen; Little Purgatory pond in Litchfield, fourteen. To Rufus Prince and others in Litchfield, fifty-two. China pond, twenty.

We have received good accounts from all the waters in Maine that have been stocked with black bass, excepting Newport pond. The latter was stocked seven years since, contemporaneously with Duck pond, Phillips pond and Cobbosseecontee pond. It should now afford fine fishing. We have had no time to visit Newport and test whether the trouble is want of fish, or ignorance of the habits of the fish and unskillful angling. The trial of a vagabond Indian, lately, for netting

fish in the pond and sending them by the barrel to the Boston and New York markets, leads us to suspect that the trouble is to be found in pot fishing and netting, and poaching generally. No use to stock ponds unless these practices can be effectively stopped. The same criminal practices prevail in Orrington, Eddington and other sections. Let the Legislature give us a law with a penalty that will cure the evil.

The small number of bass deemed by us sufficient to stock a large sheet of water, has led to so much comment and correspondence, that we quote the following from Seth Green, as containing all in a concise, true, and common sense form, that need be said on the subject :

ARTIFICIAL CULTURE OF BLACK BASS.—*Rochester, June 25, 1877.*—The question has many times been asked through your paper, why black bass were not hatched artificially by the Commission. I have not answered it because I do not like to write, and because I thought that some one would make the discovery from actual observation. As it is so simple, I will explain. There are some kinds of fish that cast their spawn, and the parents never look after them again. Nature has provided the young of this family of fishes with a yolk sac that furnishes them with food from seven days to forty-five days, at the end of which time they need food and know enough to look for it. The above family of fish do not hatch one fish to every thousand that are cast in the natural way, and should be hatched artificially; and, if they were not, they would soon run out. But other kinds of fish that make their nests, cast their spawn and take care of them until they are hatched, and then take care of their young two or three weeks after they are hatched. There is no need of hatching them artificially; if you did, they would not live, as they would need a mother's care for some days after they were hatched. They are hatched with scarcely any sack, and need food. They cluster around the mother, and she takes them where the food is and teaches them how to get it, until they learn how to get their own food—just as an old bird teaches her young, after leaving the nest, how to get their own food—then she leaves them to take care of themselves. It would be just as impossible for a young fish, belonging to the black bass family, to take care of itself just after it was hatched, as it would be for a bird just hatched to take care of itself.

Sixteen years ago fourteen black bass were put in the Potomac river, and now there are tons taken from it every year. Within five or six years the Delaware and Susquehanna rivers have had a few hundred put into them, and last year I heard of sixty being caught with one rod and line in a single day. In many of our small lakes in this State, where there were but a few mature fish put in, there will be good fishing this season.

Yours,

SETH GREEN.

FISHWAYS.

The large fishway at the dam across the Penobscot river at Bangor, was constructed by the engineer, Luther Eaton, Esq., and designed by Charles G. Atkins, Esq. This structure is of two stories of the winding stair pattern; it is 48 feet square, with 16 compartments in each story. These compartments are 12 feet square, with a rise of one foot in each compartment. The fish enter at the southwesterly corner, and having gone twice around the structure, find themselves at the entrance to the flume, 16 feet above the point of entrance. Gate-ways about four feet square, admit the water from the flume to the compartments of the fishway, into the flume and race-way, and thence into the pond above the dam. The flume is eight feet wide, extending across the upper side of the fishway. The race-way is 12 feet wide, and extends from the face of the dam to the flume, one wall of which is formed by the shore abutment of the dam; the other, by a pier of logs and stone. The floor of this race-way is three feet below the crest of the dam, and is protected from ice and drift by a wooden pier, situated some 25 feet above the dam. The floor of the different compartments is of six inch plank, overlaid with a coating of common shore stone, one foot in thickness. The compartments are divided into two sections by means of bulkheads in which four feet space are left of eighteen inches in width, admitting the passage of the fish from one compartment to another, and at the same time breaking the force of the current and forming eddies in which the fish can rest. The gates are about $3\frac{1}{2}$ by 4 feet, and are eight in number, and so arranged that they may be opened to any desired width, to admit the quantity of water required for the passage of the fish. The work has proved a success, and fish have been found in the different compartments, whenever for any cause the gates have been shut, and the water drawn off.

One result from the erection of the dam across the river at Bangor, has been to raise and set back the water as far as

Veazie, and render the narrow channel on the eastern shore, hitherto used as a fishway, and only accessible to salmon, now practicable for shad and alewives. The opening of the fishway at the Holly Works dam, was signalized by the advent and capture of alewives above Veazie; alewives were taken beneath the dam at Dover. We have this year granted the petitions of the inhabitants of the towns bordering on the line of the lakes emptying into the Penobscot at Enfield, for fishways, and laid out two at Enfield, for which plans have been rendered by Luther Eaton, Esq., and duly served upon the respective parties. The fishways will be built ready for use the coming spring. At the suggestion of Col. J. W. Porter of Burlington, a few thousand salmon fry have already been planted in these waters; they will now be made accessible to alewives; we see no obstacle in the future to these lakes becoming an important food resource to the people, while their beauty and accessibility will render them favorite places of summer resort to visitors from abroad.

A fishway has been laid out at Columbia Falls, upon petition of the inhabitants. Large numbers of alewives and salmon have yearly made their appearance beneath the dam at the Falls and been unable to get over, owing to the utter worthlessness of the old fishway. A new one has been designed by engineer Eaton, after the improved spiral plan, working drawings furnished, and Otis S. Tibbetts, Esq., the owner of the mills, has kindly assured us that it shall be promptly built the coming spring. We think the building of this fishway, and the consequent breeding of large quantities of salmon and alewives in these waters, will prove an invaluable acquisition to the inhabitants of that section.

The report of Mr. Atkins of his operations at Grand Lake stream, in taking the ova of Schoodic salmon for the Associated States and the U. S. Government, will be read with interest. In conclusion, we feel it due to acknowledge the courtesies extended us by the Eastern, the Maine Central and the E. & N. A. Railroads, through gentlemen connected

with the U. S. Commission while transporting gifts of fishes to Maine. To Hon. Noah Wood, to Hon. Moses Giddings, to Hon. George B. Jackson, to Supts. Cram and Tucker, to all the officers of these roads, we owe more than we can express for timely interest, courtesy and kindness.

Respectfully submitted.

E. M. STILWELL,
HENRY O. STANLEY.

APPENDIX.

BUCKSPORT, Nov. 30, 1877.

To E. M. STILWELL and H. O. STANLEY,
Commissioners of Fisheries, State of Maine:

GENTLEMEN :—I had occasion a year ago to report to you, in answer to your enquiries, that the supply of Schoodic salmon at Grand Lake stream had fallen off one-half since the preceding year; but I ventured to suggest that it was not safe to infer from that season's experience alone that there had been any general decrease of the fish, but that another season might bring them in plenty again. This cheerful view of the situation has been fully justified by the experience of this year. The fish have not only recovered from the decline observed last year, but have shown themselves nearly forty per cent. more numerous than in 1875. The fishing in the spring was also much better than usual, whereas last year it was very poor. We thus may form from a knowledge of the character of the spring fishing an approximate judgment as to the yield of the spawning season.

The weather this year was mild and favorable. The water in the lake and stream was very low, and this we feared might seriously interfere with our success, but happily it has turned out otherwise. The work of enclosing the parent fish was begun October 22, and the catching of fish and taking of spawn both came to a close November 24, at which date the full fish to be caught had dwindled down to one or two per day, and of the total twenty-four full females handled on that day only one was unripe. It appears that in a warm season the ovaries of the mother fish mature more rapidly and the eggs are laid earlier than in a cold season. This view is borne

out by the comparison of 1876 and 1877 with 1875. In 1875 we had a cold autumn,—particularly cold in November, and the fish were very late in spawning; more than half our eggs were taken after Nov. 20th; some unripe fish were to be found as late as December; and it was not until Dec. 8, that we were able to take spawn from the last fish on hand.

I think the fluctuations of the fish for the last three years are to be accounted for by reference to some causes, the precise nature of which is not known. The spawn-taking operations have not yet begun to exercise much influence on the supply for good or bad. Next year will be the fourth from the time when Mr. Leonard operated there, and I think that the fish that were hatched from eggs that I took in 1877 will not have time to grow up before 1879, or three years from the time they were hatched. For myself, I shall not be much surprised if both those years, or even several more pass without the influence of our operations showing itself. The fishes are subject to the operation of various natural causes, little understood, and the results of these causes may at any time show themselves in such a way as to defeat any attempt to recognize the result of the breeding operations.

To present the result of our spawn-taking in a nutshell and compare with that of 1875 and 1876, I give you this tabular statement:

YEAR.	No. of Schoodie salmon, male & female, known.	No. of Males.	No. of Females.	Per cent. of Males.	Per cent. of Females.	No. of full Females spawned.	No. of eggs taken.	No. of eggs per Female.	Date of taking spawn.
1875,	2,626	1,055	1,571	40	60	1,391	1,077,000	774	Nov. 6 to Dec. 8.
1876,	1,009	272	737	27	73	670	537,000	801	Nov. 6 to Nov. 22.
1877,	4,111	1,784	2,327	43	57	2,161	2,000,000	925	Oct. 31 to Nov. 24.

It will be seen that not only have we secured this year a larger number of eggs than usual, but there has been a larger yield per fish, being 925, as against 801 in 1876 and 774 in

1875. I had already, before the close of the season, reached the conclusion that the fish of 1877 were more prolific than those of 1876; but I am doubtful whether the same can be said as to 1875; that year our fixtures for catching the fish were less perfect, and many fish came to hand that had just begun to lay their eggs, or had laid one-third or even one-half of them, and yet were classed as "ripe fish," in the same category with those that were quite full.

The eggs were secured in good condition, and are now in process of incubation in the hatching house at the spring, Grand Lake stream.

I learn that fishes were also plentier than usual at Dobsis stream, and that quite a quantity (175,000) of spawn has been secured there by the Dobsis Club.

Very respectfully submitted.

CHARLES G. ATKINS.

COMMISSIONERS OF FISHERIES.

United States.

Prof. Spencer F. Baird Washington, D. C.

Arkansas.

N. H. Fish Pine Bluffs.
 J. R. Steelman Little Rock.
 N. B. Pearce Fayetteville.

California.

B. B. Redding Sacramento.
 S. R. Throckmorton San Francisco.
 J. D. Farwell San Francisco.

Connecticut.

William M. Hudson Hartford.
 Robert G. Pike Middletown.
 James A. Bill Lyme.

Georgia.

Thomas P. James

[Duties embracing the work of the fish interest, assigned to Commissioner of Agriculture.]

Iowa.

Samuel B. Evans Ottumwa.
 B. F. Shaw Anamora.
 Charles A. Haynes Waterloo.

Kentucky.

Pack Thomas Louisville.
 P. H. Darsey Caldwell county.
 Polk Laffom Hopkins county.
 S. W. Coombs Warren county.
 C. J. Walton Hart county.
 Jas. B. Casey Kenton county.
 John A. Steele Woodford county.
 I. H. Bruce Garrard county.
 T. T. Garrard Clay county.
 W. C. Allen Bath county.

Maine.

E. M. Stillwell.....Bangor.
Henry O. Stanley.....Dixfield.

Maryland.

T. B. Ferguson.....Baltimore.
T. W. Downs.....Denton.

Massachusetts.

Theodore Lyman.....Brookline.
Asa French.....South Braintree.
E. A. Brackett.....Winchester.

Michigan.

George Clark.....Ecorse.
A. J. Kellogg.....Allegan.
E. R. Miller.....Richland.

Minnesota.

R. O. Sweeney.....St. Paul.
A. W. Latham.....Excelsior.
Horace Austin.....St. Paul.

New Hampshire.

Samuel Webber.....Manchester.
Albina H. Powers.....Grantham.
Luther H. Hayes.....Milton.

New Jersey.

B. P. Howell.....Woodbury.
J. R. Shortwell.....Rahway.
G. A. Anderson.....Trenton.

New York.

Horatio Seymour.....Utica.
Robert R. Roosevelt.....New York City.
Edward M. Smith.....Rochester.

Ohio.

John C. Fisher.....Coshocton.
John H. Klippart.....Columbus.
E. T. Stirling.....Cleveland.

Pennsylvania.

H. J. Reeder.....	Easton.
B. L. Hewitt.....	Hollidaysburg.
James Duffy.....	Marietta.

Rhode Island.

Newton Dexter.....	Providence.
Alfred A. Reed, Jr.....	Providence.
John H. Barden	Scituate.

Utah Territory.

A. P. Rockwood.....	Salt Lake City.
[Superintendent of Fisheries, Zion's Co-operative Society.]	

Vermont.

M. Goldsmith	Rutland.
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Virginia.

A. Moseley.....	Richmond.
W. B. Robertson.....	Lynchburg.
M. G. Ellzey.....	Blacksburg.

Wisconsin.

William Welch.....	Madison.
A. Palmer.....	Boscobel.
P. R. Hoy.....	Racine.

Dominion of Canada.

W. F. Whitcher.....	Ottawa.
W. H. Venning.....	St. John, N. B.
[Inspector of Fisheries for New Brunswick.]	
P. S. Hamilton.....	
[Inspector of Fisheries for Nova Scotia.]	
Samuel Wilmot.....	Ottawa.
[Fishery Officer.]	