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HALIBUT TAGS PROVE USEFUL

W. F. Thompson Tells of Some of Results Obtained and Others Expected

STUDYING MIGRATION
Fish Seem to Move in Many Directions Without Any Definite Aim Says Scientist

(By W. F. Thompson in Canadian Fisherman)

The depths of the ocean are for the greater part mysteries to us, and where not so the truth is obscured—veiled if one so wishes to think of it. Under the surface of the sea man is more or less incapable of exploring save by defective and limited means, and the more defective and limited these are, the more energetically and the more often he theorizes. He is unable to follow directly the movements of the food fish which he captures, and around the few facts gathered he builds a wilderness of theories. It is therefore with a good deal of relief and pleasure that some direct and seemingly efficient method of exploration is discovered.

A direct method of studying migrations seems to be at hand in the tagging of fish. To attach a tag to a fish, to throw it overboard, and later to recover it at some distant point, seems to be incontrovertible evidence of migration on the part of that fish. And so it is, undeniably, and yet there are difficulties in using even such evidence. It is with the object of explaining the

LAND ACT.
Notice of Intention to Apply to Lease Land.

In Prince Rupert Land Recording District of Prince Rupert, and situate on north shore of Shannon Bay, Queen Charlotte Islands, B.C.

TAKE NOTICE that James Fielding Strang and Robert C. Gosse, of Vancouver, B.C., occupation fishermen, intend to apply for a lease of the following described foreshore at Shannon Bay, Queen Charlotte Islands:—

Commencing at a post planted on the shore of Shannon Bay about 50 feet in a southwesterly direction from southwest corner of Lot 1548, said post being northeast corner of an application to purchase by Jas. Fielding Strang; thence southwesterly following high water mark of Shannon Bay about 700 feet to a post 900 feet south and 1132 feet west of southwest corner of Lot 1548; thence west 128.5 feet to the high water mark of an island being an application to lease by Robert C. Gosse; thence northerly, westerly and southwesterly following the high water mark of said island to a point 940 feet south and 1132 feet west of southwest corner 1548; thence west 100 feet; thence north 530 feet, more or less; thence east 656 feet, more or less, to the point of commencement, and containing 8 acres, more or less.

ROBT. C. GOSSE and JAS. FIELDING STRANG, Applicant.
Per Wm. G. Mitchell, Agent.
Dated November 10th, 1925.

LAND ACT.
Notice of Intention to Apply to Purchase Land.

In Land Recording District of Prince Rupert, and situate on the south shore of Captain Cove, Pitt Island, Province of British Columbia.

TAKE NOTICE that William Joseph Jefferson, of Prince Rupert, B.C., occupation cannery-man, intends to apply for permission to purchase the following described lands:—

Commencing at a post planted on the south shore near the head of Captain Cove, Pitt Island, Range 4, Coast District, Province of British Columbia; thence south twenty chains; thence west twenty chains; thence north twenty chains, more or less, to high water mark; thence easterly along high water mark to point of commencement, and containing forty acres, more or less.

WILLIAM JOSEPH JEFFERSON, Applicant.
Per W. J. Thomas, Agent.
Dated December 11th, 1925.

LAND ACT.
Notice of Intention to Apply to Lease Land.

In Prince Rupert Land Recording District of Prince Rupert, and situate at Shannon Bay, Queen Charlotte Islands, B.C.

TAKE NOTICE that Gosse-Miller, Limited, of Vancouver, B.C., intends to apply for a lease of the following described lands:—

Commencing at a post planted about 15 chains, more or less, west from northeast corner of Lot 1548 (T.L. 8255P); thence north 225 feet; thence south (540) feet, west 900 feet, more or less; thence south 400 feet to the high water mark, in a north-easterly direction 900 feet, more or less, to the point of commencement, and containing 163 acres, more or less.

GOSSE-MILLER, LIMITED, Applicant.
Per Wm. G. Mitchell, Agent.
Dated November 17th, 1925.

LAND ACT.
Notice of Intention to Apply For Lease of Land.

In the Prince Rupert Land Recording District and situate on an unnamed islet forming one of the Narrows group of islets in Hudson Bay, Passage opposite Gore Langton Point, Blue Print R.M. 14.

TAKE NOTICE that Harris Kerr, of Prince Rupert, B.C., fishery manager, intends to apply for a lease of the following described lands:—

Commencing at a post on the shore on the East side of the above described islet, thence 3,000 feet northwest; thence 3,000 feet northeast; thence 3,000 feet southwest to the point of commencement, containing 200 acres, more or less.

HARRIS KERR, Applicant.
By his Agent, Joseph S. Rogers
Dated December 11th, 1925.

LAND ACT.
Notice of Intention to Apply to Lease Land.

In the Prince Rupert Land Recording District and situate on an unnamed islet in the Eastern entrance to Hudson Bay, Passage near Dundas Island, Blue Print R.M. 14.

TAKE NOTICE that George Gordon Bushby, of Prince Rupert, B.C., Manufacturer, intends to apply for a lease of the following described lands:—

She Coughed Night and Day Until She Used

Dr. Wood's Norway Pine Syrup



Mrs. S. E. Little, 103 Lakeman St., London, Ont., writes:—'I got a very severe cold which settled in my bronchial tubes.

I coughed night and day, and although I tried several different remedies I could get no relief until a friend advised me to take Dr. Wood's Norway Pine Syrup. This I did, and I must say that it gave me almost immediate relief as I got rid of my cough very quickly. I hope this testimonial will be the means of helping others.'

'Dr. Wood's' is put up only by The T. Milburn Co., Limited, Toronto, Ont.

merits and demerits of the method as applied to the halibut that this article is written.

Benefits of Soberne

It, however, is pointed out that there are several distinct benefits from our tagging operations which are not here discussed. One of these is the opportunity to study the amount of growth between the time of liberation and recapture. For the most part this is too brief a period, but those fish out a year or more will be good material for such study, for growth, maturity, etc., the fish too badly injured to be tagged. Material thus secured is fully as valuable as that derived from tagged fish.

As far as our marking in the vicinity of the Queen Charlotte Islands is concerned, it was found that the tagged halibut do not move in one direction. Most of them do not seem to move at all, some move twenty or thirty miles, while very occasionally one is found to have travelled over a hundred miles. There is assuredly no such definite migration as characterizes the salmon or is it for such a great distance; that much is settled, beyond reasonable doubt. From such records we can say rather confidently that certain areas are not replenished by recruits from distant banks. That will be a great gain in knowledge, providing further experiments are completed.

Difficulties of Interpretation

But there is this very noticeable fact about the recovered tags: they are retaken only where the fishery happens to concentrate for the time being. Tagged fish cannot be recovered where there is no fishery, that is certain. Had the halibut tagged off Massett scattered in all directions, one could arrive at the truth concerning this scatter only by knowing that a fair chance for recovery existed in every direction. As a matter of fact no such fair chance exists, or has

"GOVERNMENT LIQUOR ACT"

NOTICE OF APPLICATION FOR BEER LICENCE.

NOTICE IS HEREBY GIVEN that on the 2nd day of February next the undersigned intend to apply to the Liquor Control Board for a licence in respect to premises being part of a building known as "Commercial Hotel," situate at the corner of First Avenue and Eighth Street, City of Prince Rupert, upon the lands described as Lots 13 and 14, Block 9, Section 1, Map 923, Prince Rupert Land Registration District, in the Province of British Columbia, for the sale or lease by the glass or by the open bottle for consumption on the premises.

Dated this Fifth day of January, 1926.
DONALD ANDREW McLEOD,
HARRY J. WOOD, Applicants.

DEPARTMENT OF PUBLIC WORKS.
Notice to Contractors.

Biological Building, Prince Rupert.
SEALED TENDERS, endorsed "Tender for Biological Building, Prince Rupert," will be received by the Honourable the Minister of Public Works up to 12 o'clock noon of Tuesday the 13th day of January, 1926, for the erection of a Biological Station at Prince Rupert in the Prince Rupert Electoral District.

Plans, Specifications, Contract and Forms of Tender may be seen on and after the 17th day of December, 1925, and further information obtained at the Department of Public Works, Parliament Building, and at the following offices of the Government Agents at Vancouver and Prince Rupert.

Copies of plans, specifications, etc., can be obtained from the Department on payment of a deposit of ten dollars which will be refunded on return of the plans, etc., in good condition.

The lowest or any tender not necessarily accepted.
P. PHILIP, Deputy Minister and Public Works Engineer, Department of Public Works, Parliament Buildings, Victoria, B.C.

LAND ACT
Notice of Intention to Apply to Lease Land

In the Queen Charlotte Islands District, Land Recording District of Prince Rupert, and situate on the foreshore of Vestalton Bay, Massett Inlet.

TAKE NOTICE that Eugene H. Simpson, of Massett, occupation cannery manager, intends to apply for a lease of the following described lands:—

Commencing at a post planted on the high water mark about 90 chains west from the northeast corner of Lot 1550; thence north 300 feet to low water mark; thence northwesterly 500 feet more or less; thence west 100 feet to the northwest corner of E. H. Simpson's application to lease; thence southwesterly following the high water mark to the point of commencement, and containing two acres, more or less.

EUGENE H. SIMPSON, Applicant.
Per Fred. Nash, Agent.
Dated November 21th, 1925.

existed. The fishermen have, as it happens, concentrated their efforts, above all in the same place the halibut were tagged, but also in one or two nearby places where schools have this past summer congregated in numbers sufficient to encourage fishing. And there the tags were discovered.

The difficulties will increase when evidence on seasonal migrations, such as may possibly take place for spawning, is sought. Suppose the fishery concentrates at a particular locality for two months of the year, during which the fish are spawning. The remainder of the year the fishing fleet scatters widely. It would be all the same as far as the results are concerned, whether all the fish move or only a small part do so—the fisheries will see to it that only those which have scattered in certain directions are recaptured. A year later when the fishery is concentrated again on the same spot there are more tagged fish caught, but no one knows where they have been in the meantime—apparently they have stayed where they were.

Search for Fish

In other words, the recovered tags reflect to a large extent the distribution and intensity of the fishing in the regions to which the halibut penetrate. Were the intensity of the fishing but slightly variable it might be possible to ignore its effects, but this is far from true of the halibut fishery. One of its outstanding features is the constant search for fish that have happened to school in sufficient numbers to pay for fishing. The consequence is that the halibut seem to have migrated in the direction of the locality in which the intense fishery took place. They seem to have moved from one locality to another, whereas only a few have actually done so, the majority moving otherwise, scattering without much chance of recovery.

Nor is an increase in intensity of the fishery in any one place necessarily an indication that the fish have moved there from a distant point. It may simply indicate a local and temporary concentration which has brought the catch up to a point which is a paying one. There are many and many loose links in the reasoning which regards the abundance of fish as coextensive with the shifting fisheries; and in consequence, just in so far as the recovery of the tags must depend upon the fishery, so is the evidence of direction of migration, or the number of fish moving, defective.

Other Angles of Investigation

Yet there are plainly great possibilities in the use of tagging to study migration of the halibut. Were it possible to do so, evidence might be collected upon the number of skates of gear it is necessary to use to recover a tagged fish. That would give us an idea of the intensity of fishing and an estimate could be made as to whether the tagged fish were more numerous in one direction from the place of liberation than in another. We would then know the direction of migration, particularly if it were a very distinct one. But until the fishermen are willing to keep and give us accurate records of their fishing no such evidence is procurable. Such have been asked for upon the forms for reporting recapture.

It is, also, entirely conceivable that by tagging on either side of a chosen area where an intensive fishery is expected, the direction of origin of the fish taken there may be determined, by comparing the relative number recovered from the two sides. And in such experiments, where the conditions of the fishery are allowed for, we may be able to make a good use of tagging. Its usefulness depends, however, very largely on the accuracy of our information regarding the localities in which the fishery is concentrated. Again we must depend upon the fisherman and his records.

In short, tagging is a valuable means of tracing migration, but only when it is carefully considered in the light of the distribution and intensity of fishing. Tagging becomes of the greatest use when it shows plainly that only the most occasional individual travels between two areas or banks, but it becomes of very little use when it simply reflects incompletely the intensity of fishing. The fisherman's records should indicate that more adequately for us.

Problems of Technique
Added to the practical limita-

The Well-Managed Home

THE manager of a household is the purchasing agent for a large proportion of the family needs. In order to do a good job she must know what, when and where, to buy. She must study goods and the concerns which make goods and have them to sell. She must put her home on a business basis and run it on business principles in order to make the most of the family income.

Information is the only basis for intelligent purchasing. And the right way to get the greatest amount of necessary information is to read the advertisements.

Advertisements tell you what is new and good in merchandise. They reveal improvements and inventions to make your home life easier, more comfortable and more convenient. They give you information about a thousand and one things that are useful and interesting.

Every manager of a household--every member of the household who shares the responsibility for the family's welfare--should make a habit of reading the ads.

Read the advertisements in order to buy wisely

tions of the tagging method is one of technique. The tags either fall off or the fish they are placed on die faster than they should. That much is evident from European tagging experiments and must be expected in ours. The rate of return has shown that it will fall rapidly from the time of liberation, very much more rapidly in some cases than in others. We must therefore, for a given return, expect to tag considerable numbers and must expect a certain variability in results.

European workers have preferred to attach tags by silver wires run through the body near the edge. We have considered this inadvisable because of the thick body of the halibut, which is thick close to the bases of the fins, in a way which renders it hard to attach the wired tags. Furthermore, the sores or marks caused by such tags would seriously diminish, if not destroy, the market value of these large and valuable fish, thereby rendering tags a nuisance to the fisherman and discouraging their return. Finally, the halibut is well known to bury itself in the mud or sand, more particularly at certain seasons, and we would, if we could, avoid methods of tagging which might in any way interfere with natural habits. We have therefore used tags attached to the cheekbone, as has been done with the cod in European waters, at the cost, perhaps, of losing a higher percentage of our tags than would otherwise be the case.

We are also under the necessity of using hooked fish, there being no net fishery existent, and there is no way of estimating the mortality of hooked fish save by awaiting results.

Conclusions
To conclude, tagging of halibut will be of the greatest use in indicating the relative independence of areas, and when used

with a knowledge of the intensity of fishing may be of great use in determining the rate and direction of migrations. But it is evident that before undertaking any specific tagging experiment, the best possible basis of knowledge as to the distribution and intensity of the fishery should be at hand. This knowledge can be obtained only through the records of the fishermen's catches, obtained directly from vessels' logs or indirectly through dealers' records. The fisherman must, therefore, shoulder his share of responsibility if the tagging experiments are to be a success.

It is not the intention of the International Fisheries Commission to accept the returns from these tagging experiments without using the greatest care to see that the conclusions drawn therefrom are justifiable. Tagging is one of the possible methods of studying migration and the Commission is diligently following the others. It is hoped to discuss these in future articles.

LAND ACT.
Notice of Intention to Apply to Lease Land.

In Prince Rupert Land Recording District of Coast Range 5, and situate on South Rachael Island.

TAKE NOTICE that Alfred Swanson, of Prince Rupert, occupation Mariner, intends to apply for a lease of the following described lands:—

Commencing at a post on the shore on the south point of South Rachael Island; thence around high water mark to the point of commencement and containing 60 acres, more or less.

ALFRED SWANSON, Applicant.
A. E. Wright, Agent.
Dated October 26th, 1925.

LAND ACT.
Notice of Intention to Apply to Lease Land.

In the Prince Rupert Land Recording District and situate on Whitesand Island near Dundas Island, Blue Print R.M. 14.

TAKE NOTICE that Joseph Stinson Rogers, of Prince Rupert, B.C., Secretary, intends to apply for a lease of the following described lands:—

Ladies CALL

and inspect our new lines of Nursery Shoes for Children

Very strong and durable, and reasonably priced.

Family Shoe Store
Phone 357

Our Temptation

SALE is still on

ACME Importers
Third Avenue