

Sustainability is needed but at what cost to Fishermen?

A look at the Lobster Fishery and Conservation Policies in
Guysborough County

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1.0 Introduction

Throughout this paper I will be addressing the question: Are the fishermen in Lobster Fishing Area 31A meeting the recruitment requirement set out by the Department of Fisheries and Oceans (DFO). Is this a realistic requirement to meet according to their landings? I will be comparing and assessing lobster policies in LFA's 29, 31A, 31B & 32 and question whether the policies are helping or hindering the fishermen in this LFA.

The lobster fishery in Guysborough County is a small boat inshore fishery and it has been a limited entry fishery since 1968. Some license holders use their lobster licenses as a chief source of income while others use it to supplement some other type of fishing license. There are one hundred seventy six lobster licenses in Guysborough County belonging to four separate lobster fishing areas or LFA's (areas 29, 31A, 31B, 32). The lobster fishing areas 31A and 31B were once LFA 31 but this was divided in 1992 to accommodate different season opening dates. Guysborough County is further divided into four Statistical Districts 14, 15, 16, and 17 and the number of traps allowed is limited to each specific fishing district. These districts are used to record County landings and values for statistical purposes. District 14 covers an area beginning in Mulgrave and stretching to Halfway Cove; District 15 covers an area stretching from Halfway Cove to Larry's River; District 16 covers an area covering from Larry's River to Country Harbour and finally District 17 covers an area beginning in Country Harbour and end in Ecum Secum. Within the four districts there are two types of lobster licenses, Class A and Class B. The majority of Class A licenses have remained steady since the Department of Fisheries and Oceans legislated the lobster fishery as a limited entry

fishery in 1968. With a Class A license fishermen are permitted a two hundred and fifty trap limit but if you wanted to join your license with someone else than the trap limit is three hundred and seventy five traps combined. The Class A licenses can be transferred and /or sold. However, Class B license holders as of 1977 are permitted a seventy five trap limit and through further restrictions, their license cannot be sold or transferred. Therefore that license retires with its holder. Lobster Fishing Area (LFA) 31A has the boundaries east of Flying Point to Ragged Head with a total of sixty nine fishers, and it is the focus of this paper.

Figure 1: Map of Guysborough County divided into LFAs

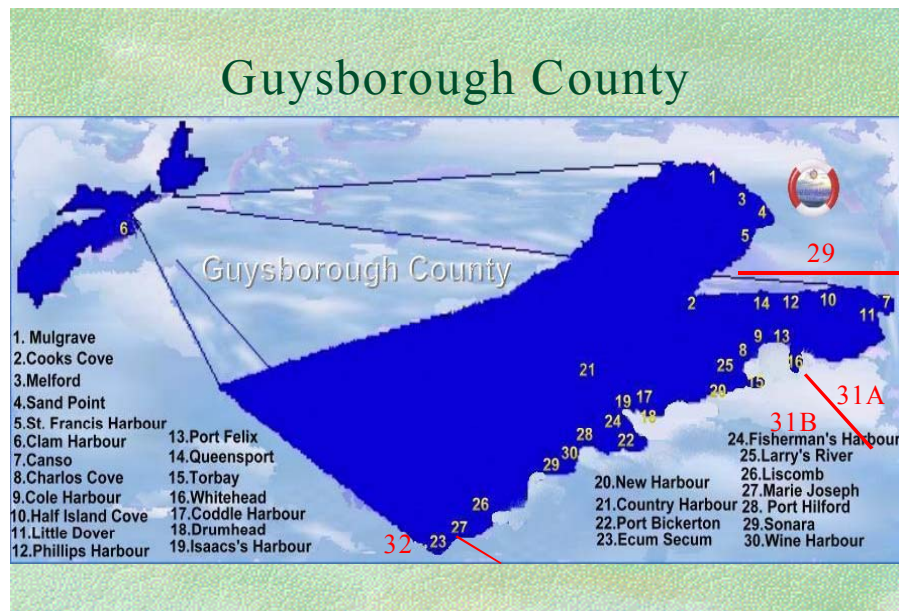
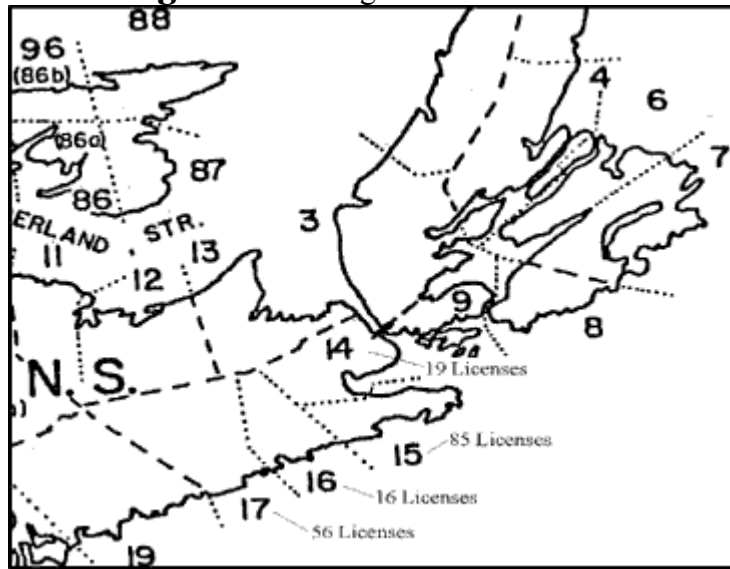


Figure 2: Fishing Statistical Districts



Source: SRSF, Factsheet 4. Lobster Policy: Inconsistencies in Regulation and Questions about Conservation Measures

The lobster fishery in the “Chedabucto Bay area of the County has traditionally been a viable fishery but the second half of this century has seen a decline in catch rates, which have yet to recover.”¹ The construction of the Canso Causeway, completely closing off the Chedabucto Bay area in the Canso Strait from St. George’s Bay and the Gulf, has had a drastic effect on the ecosystems in the Chedabucto Bay area. The Canso Causeway was opened on August 13th, 1955. The Causeway joined mainland of Nova Scotia to Cape Breton Island and it deserved immediate attention because it was the major transportation center of the region. Industrialized Cape Breton, for example the coal miners and CN Rail, wanted to construct the causeway because they wanted to transport passengers and freight such as coal and steel products over the causeway. The fishermen were not consulted on how the causeway may affect their livelihood and the greater communities.

¹ Boudreau, Virginia. Fishing for a Living, Sec 3.0. GCIFA, 2000

Lobster landings in Chedabucto Bay have been declining, as previously noted; however they have been recorded as declining gradually as far back as 1892. Nonetheless, the most drastic declines were after the causeway was built. In fact, peak landings of lobster and the construction of the causeway were in concurrence. However, currently the lobster landings are the lowest they have ever been in the history of the lobster fishery. Another effect from the construction of the causeway is that lobster larvae travel with the currents and in the summer of 1955 there were no currents because, as previously stated, the Causeway closed the Strait. Before the causeway closed the Strait, the larvae were concentrated along the Eastern Shore and drifted in a clockwise manner.

It was calculated that ten million lobster larvae should have passed through the Strait in 1975 if the causeway had not been built. But, it is likely, however, their estimate is too low, since larval abundance was based on post-causeway surveys and the numbers found were considerably less than those reported by other studies in Northumberland Strait and elsewhere.²

The decline in lobster cannot be accredited to one incident. With a combination of the causeway, over fishing, and non-causeway environmental and marine climate effects, the lobster landings have been seriously affected. As well, a huge oil spill in 1970, from the tanker Arrow, had left the lobster fishery in perils for a number of years. These industrial developments in the Strait of Canso have added pollution contaminants to the already strained ecosystems. All these factors have had a very detrimental effect on the catch landings in Guysborough County that are not consistent with the landings recorded in other Lobster fishing areas which have seen a steady increase over the years. Studies must be done to determine why the landings in Guysborough County are

² McCracken, F.D. Canso Marine Environment Workshop Executive Summary, Part 3, Fisheries and Environment of Canada, 1979.

decreasing, and what caused this to happen and most importantly what can be done to increase the lobster landings in Guysborough County.

2.0 Internship at the GCIFA

This past summer I was an intern at the Guysborough County Inshore Fisherman's Association (GCIFA), working in co-operation with SRSF (Social Research for Sustainable Fisheries). During the course of the summer I was the lobster technician for Guysborough County, which made me responsible for traveling to different lobster fishing areas within the county that had the v-notch conservation measure. In LFA's 31B and 32, fishermen were responsible for v-notching 110 lbs of lobsters. I would inspect the lobsters, take note on their condition (noting whether they were in poor, good or very good health), v-notch the lobsters and finally accompany the fishermen aboard their boat where we would sail for roughly 5-10 km and then put the lobsters back into the water. In addition, I was responsible for collecting, compiling and assessing the data from the tagging project taking place in LFA 31A. Fishermen in 31A would place a tag (with an identification number on it) on each female lobster that was between 114-124mm in size; I would record those numbers and the fisherman who tagged that lobster into a database along with recovered lobster tag numbers. Also, this summer I worked with Dr. Robert Miller, a scientist from the Bedford Institute of Oceanography located in Dartmouth, on the GCIFA lobster project. For this project I, Dr. Miller and two other interns participated in plankton sampling, larval tows and compiled the data from this information. The purpose of the tagging was to find out where berried females were located and to reach an estimated number of berried females in each port which will give

the membership of the GCIFA an idea of the state of the lobster fishery in their area.

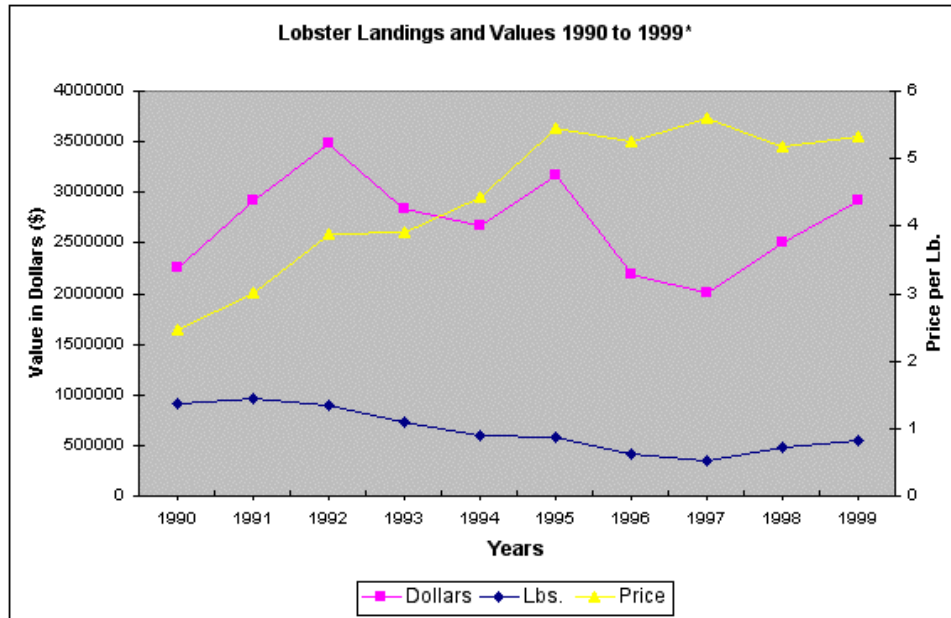
These projects will be further discussed throughout the paper.

When lobster larvae hatch they float to the water's surface where they will develop over the next 20 to 40 days. The rate at which larval lobsters develop is related to water temperature. Lobsters go through 3 larval stages in their development, molting between each stage. Although lobster larvae can move up and down in the water column to take advantage of food or to escape predators, they are unable to swim against currents. "These planktonic larval lobsters are largely at the mercy of water movements during their early stages of development, and thus can be carried considerable distances."³ Lobsters in their last stage of development before settling (postlarvae) are active swimmers, resembling miniature lobsters. At this stage they begin diving to the bottom, seeking out suitable habitat. These tiny lobsters require some kind of shelter such as cobble rock or eel grass where they can hide from predators. The membership of the Guysborough County Inshore Fisherman's Association (GCIFA) suspect that postlarval lobsters in Eastern Nova Scotia will not settle out where the bottom temperature is below 11°C. If a postlarval lobster makes its way to the bottom and does not find suitable conditions, it will return to the surface and drift with the currents before returning to the bottom once again in search of suitable habitat.

³ Mombourquette, Kathy. Campbell, Ellen. Lobster Project 2002. GCIFA, 2002

Figure 3: Lobster Landings and Values in Guysborough Co. for Areas 14, 15, 16, 17.

Source: Boudreau, Ginny. *Fishing For a Living*, 2000



As seen in Figure 3, there was a steady decrease in the amount of lobsters caught (in pounds) in Guysborough County from 1990 to 1997; going from approximately 1,000,000 lbs in 1990 to an astonishing 500,000 lbs of lobsters caught in 1997. This is a 50% decrease in catch effort. However, there was a slight increase in 1998 and 1999 to approximately 700,000 pounds caught. Correspondingly, the price of lobsters has risen steadily from about \$2.25/lb in 1990 to approximately \$5.25/lb in 1999 due to the supply and demand factor; there are not many lobsters available, but the demand for them is high. In spite of this increase in price, the overall dollar value of the lobster fishery in Guysborough County has dropped from \$3,500,000 in 1992, to a little under \$3,000,000 in 1999. This is a concern because the lobster fishery is becoming hard to maintain, in part because the landings are so low in some areas that it costs more to go out lobster fishing than the economic returns. All of the landings for each district are

totaled together to make the lobster landings in all of Guysborough County. The department of Fisheries and Oceans has put many lobster conservation measures in place to try to increase the value of the lobster fishery, and the amount of lobsters caught in Guysborough County. However, if you refer to the data previously stated the lobster fishery was still in peril in 1999, with just a slight increase in lobsters caught.

3.0 DFO Policies

Since 1989, the lobster fishery in Nova Scotia has included the following conservation measures assigned by the Department of Fisheries and Oceans:

- ◆ Trap Limits: the number of traps that each license holder can use is limited, thus reducing pressure on the stock and limiting the effort and cost to individual license holders. Tagging each trap or using color-coded identification on the floating buoys that mark the traps of each fisherman enforces trap limits.
- ◆ Closed Season: these are times when fishers cannot fish for lobster in a specific area, thus allowing time for lobsters to molt, grow ad mate.
- ◆ Berried lobster: egg-carrying females are tagged and released in order to protect the egg supply of the stock. When fishers get berried lobsters in their pots they must record the tag number, date and place of the capture and the lobster must then be released (some LFA's have adopted this measure).
- ◆ Carapace Size: carapace size restrictions are used to stop the capture of lobsters before they can mature and contribute eggs to replenish the stock. This measure also has the effect of maximizing the total yield ion both weight and value from the fishery.

- ◆ Limited Entry: the number of licenses available for the fishery are strictly limited.

This has had a dramatic effect on the fishery since it keeps capital and operating costs down and incomes up by controlling the number of vessels in the fishery.

Limited entry is not used simply as a conservation measure but also as a way of making sure that lobster fishing will be profitable for those engaged in it. If too many fishers on the water at one time and there are not many lobsters available to catch, then the profit of each individual fisher will be low.⁴

Nevertheless, the lobster fishery still seemed to be declining in some lobster fishing areas so research into this issue was needed.

4.0 FRCC Recommendations

In 1995 the Minister of Fisheries and Oceans, the Honorable Brian Tobin, asked the Fisheries Resource Conservation Council (FRCC) to determine the state of the lobster fishery. The FRCC believes that the “lobster industry is harvesting too much, and leaving too little, therefore the FRCC is attempting to increase the number of eggs per recruit and accordingly they are recommending a reduction in both exploitation rates and the effective fishing effort.”⁵ The FRCC... "concluded that the level of exploitation in the lobster fishery was too high resulting in too few females having an opportunity to spawn."⁶ As a result of these FRCC recommendations a long-term management plan was developed specifically for each individual LFA, along with consultations with the area fishers.

⁴ Beason, Matthew. Peitzsche, Judy. Lobster Policy Fact Sheet. Guysborough County Inshore Fishermen's Association. August 2001.

⁵ Crandlemere, Tara. 2001 Lobster Conservation Harvesting Plan: Lobster V-Notch & Tagging Program For LFA 32 and LFA 31B. Eastern Shore Fishermen's Protective Association, 2001.

⁶ Report of the Conservation Working Group, December 2001

The following paragraph is a quote taken out of *The Report of the Lobster Conservation Working Group* that was submitted to the Assistant Deputy Minister of Science and Fisheries Management in December 2001, noted:

As a result of the Fisheries Resource Conservation Council (FRCC) recommendations, multi-year conservation harvesting plans are being put into place to promote conservation. The stated goal of the plan was to put measures in place by 2001 to lead to doubling of the level of eggs per recruit. While positive steps have been made towards this goal, with exception of a few areas, this goal has not yet been met.⁷

4.1 FRCC Four Year Plan

The four-year plan would begin in 1998 and end in 2001, with the goal being to "double the egg production per recruit (as previously stated)...which refers to the average numbers of eggs a female will produce in her lifetime."⁸ In a DFO news release, dated for April 1998 stated that:

...specifically, the fishermen in LFA's 27 to 32 in Eastern Nova Scotia indicated that they would like to see a significant impact on egg production as soon as possible and that an increase in carapace size was the most effective way to achieve this. These fishermen are considering additional measures for future years, such as maximum size limits, trap limit reductions and further increases in carapace size.

But, as acknowledged in the FRCC report there was some resistance to implement the measures and in most areas the goal of doubling the egg recruit was not met.

⁷ Et.al

⁸ Et.al

TABLE 1*Table: Atlantic Lobster Conservation Strategy- 1998-2001*

LFA 26B	Year 1-1998 <u>Announced:</u> 50% V-notching with validation in 1999 onwards <u>Actual:</u> No v- notching	Year 2-1999 <u>Announced:</u> No change <u>Actual:</u> No v-notching	Year 3-2000 <u>Announced:</u> No change <u>Actual:</u> No v-notching	Year 4-2001 <u>Announced:</u> No change <u>Actual:</u> No v-notching	2002 <u>Carapace</u> 70mm
31A	<u>Announced:</u> 1.5mm carapace size increase <u>Actual:</u> 1.5mm carapace size increase to 82.5mm	<u>Announced:</u> 1.5mm carapace size increase <u>Actual:</u> 1.5mm carapace size increase	<u>Announced:</u> Maximum size of 127mm OR closed window (no females between 114-124mm) <u>Actual:</u> 2mm carapace size increase	<u>Announced:</u> 2mm carapace size increase <u>Actual:</u> Closed window for females, 114- 124mm	<u>Carapace</u> 86.5mm + Closed window 114-124mm
31B	<u>Announced:</u> 1.5mm carapace size increase <u>Actual:</u> 1.5mm carapace size increase to 82.5mm	<u>Announced:</u> 1.5mm carapace size increase <u>Actual:</u> 1.5mm carapace size increase	<u>Announced:</u> Maximum size of 127mm OR closed window (no females between 114-124mm) <u>Actual:</u> 1.5mm carapace size decrease plus v- notch/release of 17,000lb females	<u>Announced:</u> 2mm carapace size increase <u>Actual:</u> V-notch/release of 8500lb mature females	<u>Carapace</u> 82.5mm + V-notch 110lb female lobsters per fisher
32	<u>Announced:</u> 1.5mm carapace size increase <u>Actual:</u> 1.5mm carapace size increase to 82.5mm	<u>Announced:</u> 1.5mm carapace size increase <u>Actual:</u> 1.5mm carapace size increase	<u>Announced:</u> Maximum size of 127mm OR closed window (no females between 114-124mm) <u>Actual:</u> 1.5mm carapace size decrease plus v- notch/release of 35,000lb of females	<u>Announced:</u> 2mm carapace size increase <u>Actual:</u> V-notch/release of 175000lb mature females	<u>Carapace</u> 82.5mm + V-notch 110lb female lobsters per fisher

* The table is an extract from the Report of the Lobster Conservation Working Group

** Year 2002 column is my interpretation of first four columns in the table

As can be seen from Table 1, during each year of the four-year plan the fishermen were given a measure to use. In 1998, the measure for 31A, 31B and 32 was 1.5mm carapace size increase to 82.5, in 1999 the measure was a 1.5mm carapace size increase to 84, in 2000 the measure for the 31A was 2mm carapace increase to 86mm; 31B and 32 measure was a 1.5mm carapace size decrease plus v-notch release of female lobsters (amount of females to be v-notch and released varied from one area to the other). The fishers agreed to increase the minimum carapace size by one-eighth inch a year for three

years. Then, in 2001, the final year of the program, DFO proposed that fishermen themselves should choose to implement one of the following four conservation options:

- 1.) Land, record, verify, v-notch and release a set amount of mature female lobsters throughout the course of the fishing season, the amount to be determined by DFO. This option would have allowed for a slight reduction in minimum carapace size since the v-notch program ensures the survival of a sufficient number of mature females. This was the first choice of fishers in LFA 31A and is the measure being used in 31B.
- 2.) Set hoop sizes at 6" in order to avoid the capture of larger lobsters and reduce the minimum carapace slightly to 84mm. This was the second choice of LFA 31A fisher and is the method being used in LFA 29.
- 3.) Set a maximum size limit of 127mm (5") for females. There was no support this option.
- 4.) Adopt a "closed window" system prohibiting the capture of females 114 to 124mm in length.⁹

After the fishermen voted to adopt the first option described above, DFO officials advised them that the option was no longer available and that they would have to adopt the closed window system. Despite the processes of consultation that had been put in place, the fishermen were given no choice regarding conservation measures for 2001. The measure in 31B and 32 was to v-notch and release female lobsters (amount to be v-notched and released varies in each area).

The fishermen within the GCIFA membership support conservation; but feel that what DFO policy is asking them to do is above and beyond what their resources can

⁹ Government of Canada. Lobster Conservation Measures Announced. DFO News Release. April 5th, 1998

allow them to accomplish. Furthermore, the Guysborough County Inshore Fisherman's Association members applied their conservation measure every year in the four year management plan, beginning in year one and took initiative when, in other areas, the fishermen took little initiative and started on the third or fourth year of the program. For example, in "LFA 26B a 50% v-notching with validation in 1999 onwards"¹⁰ was announced but in actuality no v-notching was applied in any of the four years of the management plan. As a result, the GCIFA membership of 31A are concerned and are working on a lobster tagging project to see just how many the fishermen in 31A are contributing to the recruitment recommendation.

5.0 GCIFA Lobster Tagging Project

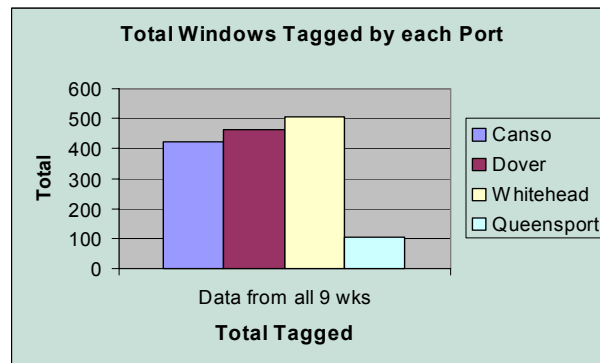
The fishermen are challenging the conservation policy because of the low incomes and low landings, poor seasons and prices and the fact that measures are controversial on both sides of the line. The fishermen argue that conservation measures/DFO policy should take into consideration the conditions within each LFA, the number of fishers within each LFA and the landings in that LFA and use data to create a conservation measure/policy that best reflects that lobster fishing area. In LFA 31A, for example, their 2002 measure can be sold on both sides of them in 31B and 29 (the measure in LFA 31A is the closed window).

To collect data for the tagging project, the participating fishermen in 31A tagged all berried and unberried window lobsters with wire-ties and recorded the tag numbers. In addition, they were to record the tag numbers of any tagged lobsters recaptured (do not remove the tag). Lobster fishing areas 31B and 29 fishermen were to remove any 31A

¹⁰ Canada Department of Fisheries and Oceans. The Scotia Fundy Lobster Fishery: Summary Report. Scotia -Fundy Region. Program Coordination & Economic Branch. May 1989

tags captured and return tags to GCIFA. The purpose of the tagging was to see how much the fishermen in 31A are contributing to recruitment recommendation. Also, to find out where berried females are located and to reach an estimated number of berried females in each port. As well, the purpose of the tagging project was for the GCIFA to gain the ability to record the amount of lobster's fishermen from each port in LFA 31A were throwing back into the water only for LFA's 29 and 31B to catch the lobsters and sell them for profit with no penalty. The fishermen were very committed to the project indicated by donating their time, boat and equipment to myself, Dr. Robert Miller and the other interns.

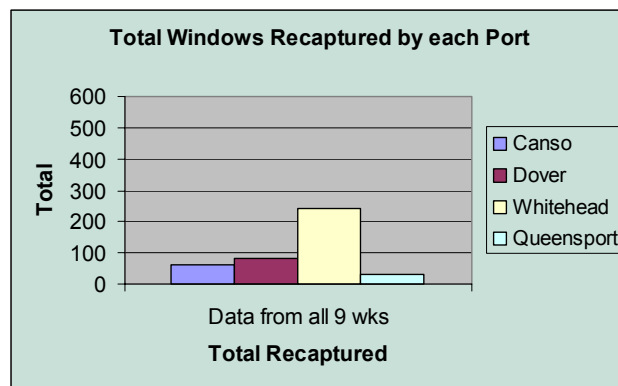
FIGURE 4
Total Window Lobsters Tagged by the four participating ports in Eastern Guysborough County



Referring to Figure 4, you can see that the four ports that participated in the lobster tagging project put forward by the Guysborough County Inshore Fisherman's Association were Canso, Dover, Whitehead and Queensport they are ports are all located in Eastern Guysborough County and are all in LFA 31A. The window lobsters were to be tagged, released and recorded for the nine week lobster season during the summer of 2002; beginning on April 29th and ending in June 30th. The total number of window lobsters tagged was 1494. Canso fishermen tagged 424 window lobsters, 462 window lobsters

were tagged in Dover, 503 window lobsters were tagged in Whitehead and 105 window lobsters were tagged in Queensport. The port with the highest number of tagged window lobsters was Whitehead with 503 lobsters tagged, this is predictable because Whitehead has the highest lobster landings overall between the four ports. The port with the lowest number of tagged window lobsters was Queensport with 105 lobsters tagged, which is also predictable because Queensport has the lowest lobster landings overall between the four ports. Canso and Dover tagged similar numbers of window lobsters.

FIGURE 5
Total Window Lobsters Recaptured by the four participating ports in Eastern Guysborough County



As you can see from Figure 5, the recaptures total was 416 window lobsters. Canso fishermen recaptured 62 tagged window lobsters, 82 recaptured in Dover, 243 recaptured in Whitehead and 29 recaptured in Queensport. The port with the highest number of recaptured tagged window lobsters was Whitehead with 243 recaptured lobsters, which is consistent with the landings overall and the data shown in Figure 4, on the number of window lobsters tagged (503). It is predictable that the port with the highest number of tagged window lobsters would recapture the highest number of tagged window lobsters. The port with the lowest number of recaptured tagged window lobsters was Queensport

with 29 tagged window lobsters, which is also consistent with the landings overall and the data shown in Figure 5, on the number of window lobsters tagged (105). Again, it is predictable the port with the lowest number of tagged window lobsters would recapture the lowest number of tagged window lobsters. Canso and Dover have similar numbers of recaptured tagged window lobsters with Canso fishermen recapturing 62 tagged window lobsters and fishermen from Dover recapturing 82 tagged window lobsters.

Figures 4 and 5 indicate that the landings in Queensport are very poor; a fisherman may only catch an average of fifty pounds of lobsters in two days of fishing; comparatively a fisherman Whitehead could catch an average of two hundred pounds of lobsters in one day of fishing. The landings show numbers that one would think were from two totally different lobster fishing areas, not from the same fishery, the same LFA that is taking place at the same time of the year and from two ports that are very closely located. Both Whitehead and Queensport have the same conservation measures. This is why fishermen argue that they are being asked to do what is above and beyond their resources allow them to do. For example, fishermen in Whitehead, Queensport, Canso and Dover are asked (by DFO conservation measures/policy) to tag, record and throw back all of their window lobsters. Fishermen in Whitehead can afford to do throw back their window lobsters and still make a good livelihood from the fishery but fishermen in Queensport (along with Canso and Dover) cannot afford to throw back their window lobsters. This is harming their livelihood. This is why the fishermen argue that conservation measures/DFO policy should take into consideration the conditions within each LFA, the number of fishers within each LFA and the landings in each port in that

LFA and use this data to create a conservation measure/policy that best reflects that lobster fishing area.

6.0 Lobster Project 2002

The four year plan ended in 2001. This past summer the fishermen in 31A have put together a lobster project that would give them some idea of the impact the conservation measure. It is interesting to note that the tagging project and the lobster project were going on simultaneously. The lobster project

...consisted of student interns [and two other interns] working with GCIFA to assist the lead research scientist, Dr. Robert Miller in the research project. The study entailed a combination of a field program (larval sampling and drifter tracking), numerical modeling and an analysis of the observed and simulated drifter trajectories. The purpose of the larval tows was to find the dates when hatching begins and ends (i.e. when stage I's appear and then disappear), and when settling begins and ends (i.e. when stage IV's appear and then disappear)"¹¹

For the larval tows we used a fine mesh net rigged to an aluminum frame with an 8' by 2' opening. The net was towed behind the boat, and a wooden deflector mounted on the side of the frame kept the net away from the wake of the boat. We collected about 12 samples per trip. Each tow lasted 10 minutes and the net was towed at a speed of about 3 knots. A flow meter mounted on the frame measured the distance the net moved through the water in each tow so we could calculate the volume of water passing through the net. We attempted to sample each station bi-weekly but weather and availability of boats and captains interfered. A total of 129 samples were collected from July 22 to September 17, 2002. Samples were preserved in 10% formaldehyde and lobster larvae were identified to stage within 2 days of collection.

¹¹ Boudreau, Virginia. Guysborough County Inshore Fisherman's Association, Fisheries and Oceans Canada Science Horizons-Science and Technology Youth Internships Program, 2002.

Stage I larvae were most abundant in late July, and we saw reduced numbers of stage I's in mid-August. Stage IV larvae began appearing in early August and were most abundant in mid-August. Some stage II and stage III larvae were identified in late July. Numbers for stage I and stage IV larvae had dropped off by the time sampling ended in mid-September. There were many more stage I larvae than stage IV's in all locations.¹²

The two interns, myself and Dr. Robert Miller along with a volunteer fisherman would set six drifters in both shallow and deep waters in different areas in each of the four ports (Canso, Dover, Whitehead and Queensport). This would tell us where and how the currents are moving and the speed of the current, which would in turn tell us where the lobsters are drifting. In order to estimate drift, we need to know where and when lobster larvae are in the water in Guysborough County. To do this we conducted a survey of berried females and a series of plankton tows. The location of berried females in June is near where they will hatch their larvae and where, in turn, we should begin to see larvae in the early stages of development. This is where larval drift should begin. Information on berried females was collected in May and June in LFA's 31A and 31B. Surveyors/interns accompanied local fishermen at sea on their regular trap hauls. Thirteen sea samples were completed during the 2002 lobster fishing season. Trap locations were recorded about every 5 traps, with or without berried females. All of the larvae lobsters were found near the shore and 90% of them were found in water less than 10 fathoms deep.

Thus, for the lobster project, under the supervision of Dr. Robert Miller, the interns were to collect, identify and estimate the occurrences, survival and retention of the stage IV larvae near shore. The fishermen volunteered their time and boat to assist the interns with data collection and field work because, as previously stated, they are

¹² Mombourquette, Kathy. Campbell, Ellen. Lobster Project 2002. GCIFA, 2002

concerned that what DFO is asking them to do is above and beyond their resources to accomplish. As a result, in order to get high-quality results from the project, the fishermen took on a helpful role in data collection. From this year's lobster project we found that berried females were distributed all along the coast. We found that hatching in this area began before the end of July and ends in mid-August. Stage IV's appear (i.e. settling out begins) in early August and disappear (settling out ends) in September. We caught substantial numbers of stage I's, and more stage IV's in this year's sampling than in samples collected in the 1990's. However, many samples need to be collected, and sampling must be repeated frequently.

7.0 Conclusion

A review of the project and presentation of results took place on October 9, 2002. After the presentation, GCIFA members discussed how they would like to see the project progress. A general consensus was that another year of plankton sampling should be completed. If funding can be secured and a reliable boat and captain identified, sampling could be done in a timely and consistent fashion. Association members also expressed an interest in sampling juvenile lobsters in the future. These studies, along with the temperature and drift studies that took place this summer, will give us a more complete picture of lobster recruitment and distribution in eastern Guysborough County. I think that it is obvious that fishermen in LFA 31A are meeting the recruitment requirement set out by the Department of Fisheries and Oceans and that this is way above and beyond their resources to accomplish because as shown throughout this paper the lobster fishery in 31A is a risk due to declining lobster stocks. How can a community that is faced with reduced catch levels of lobster have a conservation measure that makes it mandatory to

put lobsters back into the water that can be caught by fishermen on either side of the line of them? For example, in LFA 31A their 2002 measure was a closed window where any lobster between 114-124mm has to be put back into the water, just to be caught and sold on both sides of them in LFA's 31B and 29. Therefore, I do not think that this is a realistic requirement to meet according to the fishermen's landings in lobster fishing area 31A.

What is to be thought of DFO policies/conservation measures? I argue that if a conservation measure/policy is going to be put into place then it should consider how it will effect the fishermen's livelihood within each LFA; including the various ports in each LFA as seen in 31A (there are four different ports in LFA 31A but the landings vary greatly between these ports). This should be taken into consideration when policies are being made that affect the livelihood of many fishermen. Instead of putting a policy/conservation measure in place that only the port with the highest landings within that LFA can really afford to do without greatly affecting their livelihood; a policy should be put into place that each port within that LFA can afford to do. For example, as previously discussed, the landings in Queensport are very poor; a fisherman may only catch an average of fifty pounds of lobsters in two days of fishing; comparatively a fisherman Whitehead could catch an average of two hundred pounds of lobsters in one day of fishing. The landings show numbers that one would think were from two totally different lobster fishing areas, not from the same fishery, from the same LFA that is taking place at the same time of the year and from two ports that are very closely located. Both Whitehead and Queensport have the same conservation measures. This is why fishermen argue that they are being asked to do what is above and beyond their resources

allow them to do. Fishermen in Whitehead can afford to do throw back their window lobsters and still make a good livelihood from the fishery but fishermen in Queensport (along with Canso and Dover) cannot afford to throw back their window lobsters. This is harming their livelihood.

Therefore instead of putting a policy/conservation measure in place that only the port with the highest landings within that LFA can really afford to do without greatly affecting their livelihood; a policy should be put into place that each port within that LFA can afford to do. This should be considered by DFO when putting conservation measures in place because fishermen have to follow DFO policy or they may lose their fishing licenses and/or equipment (boat, traps, nets etc). I think that this is extremely important and that the livelihood of fishermen should be DFO's number one concern when they are making a policy or conservation measure that fishermen are going to have to put into place. Optimistically, the lobster projects that the membership of the Guysborough County Inshore Fisherman's Association have implemented and are continuing to implement will indicate a way of sustaining the fisherman's livelihood in relation to this work.

Perhaps, the management of the lobster fishery should be switched from management from DFO to management by the fishers. The fishermen are the most affected by the conservation measures especially if the measure does not work and their fishery is in jeopardy; than the fishers can figure out the best conservation measure that will deal with this issue; and allow them to maintain a sustainable livelihood at the same time. On the other hand maybe a more collaborative effort between fishers, fishery scientists and fishery officers is the best way to manage the fishery. However, as I have

found in my research, collaborative work is not always a success. For example, despite the processes of consultation that has been put in place between DFO managers and the membership of the GCIFA, fishermen were given no choice regarding conservation measures for 2001. Then again, the membership of the GCIFA is working co-operatively with scientists from the Bedford Institute of Oceanography (BIO); all is going well and the lobster project seems to be running smoothly. The project is going well because both the GCIFA membership and the scientists from BIO feel that the project must be continued for the next few years until a desired amount of data is collected that allows both fishers, fishery scientists (and to some extent DFO) to draw substantive conclusions from the results. In any case, there is room for improvement in relations between fishers, DFO managers/fishery officers, and fishery scientists.

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