

# **Charting the Course of the Historical Lobster Fishing Districts in the Maritimes Region: 1899-Present**

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## ABSTRACT

Campbell-Miller, J., Pourfaraj, V., Parlee, C.E., Cook, A.M. 2024. Charting the Course of the Historical Lobster Fishing Districts in the Maritimes Region: 1899-Present. Can. Tech. Rep. Fish. Aquat. Sci. 3606: v + 52 p. <https://doi.org/10.60825/pysr-pq36>

This report outlines the results of a project that created a series of maps tracking inshore historical Lobster fishing district boundaries from 1899 to present. This work was part of DFO's Blue Economy Lobster Team pilot project. To provide the context for the use of historical information within fisheries research, this report provides a brief summation of the discipline of history, its purpose, and its methods. It also describes the different ways that historical data has been used to support the analysis of fisheries, and some of the ways that historians have integrated the techniques of natural and social sciences into their own work. The report presents two sets of maps that outline geographical changes in Lobster fishing districts (called Lobster Fishing Areas after 1985) as well as changes in minimum legal size (MLS) and season length information. These maps help to highlight several themes within the history of the lobster fishery, including the increasing regulation of the fishery over time, the inshore nature of the Lobster fishery until recently, the variability of management units over time, and the transition from a cannery-based to a live market.

## RÉSUMÉ

Campbell-Miller, J., Pourfaraj, V., Parlee, C.E., Cook, A.M. 2024. Charting the Course of the Historical Lobster Fishing Districts in the Maritimes Region: 1899-Present. Can. Tech. Rep. Fish. Aquat. Sci. 3606: v + 52 p. <https://doi.org/10.60825/pysr-pq36>

Ce rapport présente les résultats d'un projet qui a permis de créer une série de cartes illustrant les limites historiques des districts de pêche côtière du homard de 1899 à aujourd'hui. Ce travail a été réalisé dans le cadre du projet pilote de l'équipe homard de l'économie bleue du MPO. Afin de mettre en contexte l'utilisation d'informations historiques dans la recherche halieutique, le présent rapport résume la discipline de l'histoire, son objectif et ses méthodes. Il décrit également les différentes façons dont les données ont été utilisées pour soutenir l'analyse des pêcheries, et les façons dont les historiens ont intégré les techniques des sciences naturelles et sociales dans leur travail. Le rapport présente deux séries de cartes qui décrivent les changements géographiques dans les districts de pêche au homard (appelés zones de pêche au homard après 1985) ainsi que les changements dans la taille minimale légale et la durée de la saison. Ces cartes mettent en évidence plusieurs thèmes dans l'histoire de la pêche notamment la réglementation croissante de celle-ci, sa nature côtière jusqu'à récemment, la variabilité des unités de gestion et la transition d'un marché basé sur les conserveries à un marché de produits vivants.

# INTRODUCTION

Fisheries and Oceans Canada's (DFO) Blue Economy Lobster Team (BELT)<sup>1</sup> is part of a pilot project aimed at combining the methods of the natural and social sciences and humanities (SSH) to develop and provide advice on the full-spectrum sustainability of the Lobster fisheries within the Maritimes Region (Pourfaraj et al 2022ab; Parlee et al 2023). Part of this work has included using historical research methods to complete three major objectives: 1) create a timeline of the Lobster fishery that will be available within DFO, particularly to the Lobster Ecology and Assessment Team (LEAT), to inform their understanding of the prosecution of the Lobster fishery over time, 2) compile historical data related to the Lobster fishery, potentially to expand stock assessment approaches and 3) help inform the SSH research project component of the BELT's work (see Parlee et al., 2023). This technical report will focus on one project within this larger historical work, which is the analysis of major changes in Lobster fishing regulations and the development of maps tracing changes in historical inshore Lobster Fishing Districts (now Lobster Fishing Areas, or LFAs) from 1899 to present.<sup>2</sup>

This report will begin by providing a brief summation of the discipline of history, its purpose, and its methods. It will then describe the different ways that historical data has been used to support the analysis of fisheries, and some of the ways that history has incorporated social and natural science methods. This report will then briefly describe how the BELT has incorporated historical methods and methodologies into their own work, and describe in detail how the team blended historical methods with modern spatial tools to build a series of maps that track changes in inshore Lobster fishing districts from 1899 to 1985 as well as changes in fishing seasons and minimum legal size (MLS).<sup>3</sup>

These series of maps help to highlight several themes within the fishery. The first is the change in importance of the Lobster fishery over time. As the Lobster fishery expanded, regulations adapted and expanded, reflecting the increased ability of the government to enforce them and importance of the fishery to the Region. The second is the intensely inshore nature of the Lobster fishery for the majority of the twentieth century. The regulations, and therefore the maps, lack a defined outer boundary, as fishers had few reasons, and often little ability, to venture far offshore. The third is the variability in the boundaries of Lobster districts over time. From 1899 to 1985, districts changed thirteen times, with the majority of those changes happening prior to 1950, potentially providing insight into the push and pull between the needs of local fishers and the practicality of implementing regulatory control over fishing boundaries. A separate set of maps depict both seasons and minimum legal size information (Appendix I, post-1985 data can be found in Appendix II). The information on minimum legal size helps to

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<sup>1</sup> The Blue Economy Lobster Team has been funded under the Deputy Minister's Results Reserve Fund. The project date was from January 2021 to March 2023.

<sup>2</sup> To reflect the historical nature of this work, this report will primarily use the term "District" to refer to Lobster Fishing Districts or Lobster Fishing Areas (LFAs), unless referring to the period after 1985 when the term LFA will be used.

<sup>3</sup> In general, the 1985 map reflects the current LFA boundaries. An amendment in 2022 did alter the boundary line between LFAs 33 and 34, moving the position from Latitude 43° 29' 48", -65° 31' 00" to 43° 29' 47.7", -65° 31' 11.1" (Atlantic Fishery Regulations 2022). However, the 1985 map within this report (figure 13) is still representative of the present boundaries as the change is too small to be visible. This is not the case for the MLS or season lengths, as those have undergone changes since 1985.

track the changes in the Lobster market that occurred over the course of the twentieth century, with the broad transition from a cannery-based market to a live market over time.

Finally, the maps taken as a whole help to demonstrate that despite the internal variability of certain components of the regulations, the regulatory approach to Lobster remained remarkably consistent since the turn of the twentieth century. The overall format of using fishing seasonality determined by particular geographical boundaries, and the use of minimum legal sizes became the pillars of modern Lobster fishery regulations in Canada, which continues to the present day.

## **HISTORICAL METHODS OF RESEARCH**

The scholarly profession of history is part of a range of disciplines known collectively as the humanities. The humanities “study the meaning-making practices of human culture, past and present, focusing on interpretation and critical evaluation,” using “trained modes of engagement with culture” (Small 2013). Put more succinctly, the humanities try to understand “the human condition in all its variety” (Bodenhamer et al. 2010).

History was one of the first disciplines to professionalize and adopt standardized methods of practice. The modern practice of history is most often traced to the work of Leopold Van Ranke at the University of Berlin in nineteenth Century Germany, who trained students in the “rigorous science” of history, with a focus on the use of evidence (Iggers 2013, 23-30). There are obvious limits to the full adoption of Von Ranke’s pursuit. Historical evidence is often limited by availability, and its interpretation and analysis ultimately relies on the subjectivity of the historian. Despite these challenges, the historian aims to narratively reconstruct an aspect of humanity’s past based on the rigorous evaluation and analysis of primary (i.e. produced in the time period under investigation) and secondary (i.e. published analytical) sources, usually within the context of, and sometimes in opposition to, a body of scholarship working toward the same goal.

Historians’ methodologies are usually qualitative, with the dominant method being textual analysis of primary documentary sources, though some historians also specialize in visual analysis (e.g. photographs) or material culture (e.g. objects). The topic of research is framed by a research question, and bounded by a particular set of parameters, including timeframe and geography. The choice of a topic with reasonable parameters is a skill that the historian must hone over time, and frequently these parameters change during the course of research in response to the availability of sources and time to complete the research.

The location of research is most often an archive, and historians rely on these publicly funded institutions and the legislation that guides a particular governments’ information management systems (e.g. rules around disposal of documents, access to information and privacy legislation) that make primary sources available. Historians may also rely upon private archives, ranging from institutional (e.g. church) to privately held materials. Increasingly, primary sources are being made available on digital platforms, though the digitization of materials can be expensive and time consuming. Historians also rely on oral history, interviewing figures central to the research under consideration or who have knowledge of histories passed through oral traditions. In order to conduct research with humans, most historians working within a university setting must have their research program reviewed by a research ethics board.<sup>4</sup>

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<sup>4</sup> Though this discussion represents the “typical” professional historian working within a scholarly institution such as university, there are also those who specialize in public history, and may work in

The ability to efficiently find historical sources of evidence is one of the major skills that historians develop and rely upon in the course of their work, and this expertise is narrowed further by their field of research. For example, a political historian of twentieth century foreign affairs will become very familiar with the archival *fonds*<sup>5</sup> of international affairs or defence departments of major governments that contain important policy documents. A social historian of medieval Europe will instead become knowledgeable about court and church records that tell them something about how average people lived in that era. Nevertheless, certain basic investigative skills are shared by most professional historians, for example, the identification of relevant primary sources by scoping the references of published works.

Whatever the source of evidence, it is up to the historian to evaluate its credibility, find corroborating evidence where possible, and decide which sources should or could be used to answer the initial research question. As is the case in the natural sciences, it is common for the research question to change as a result of the pursuit of this data or evidence. This is because a research question is, by its very nature, framed on the basis of known assumptions. If the historian finds new evidence that challenges these assumptions, the question must also change. As historian Michelle T. King writes, “We go into the archives not to find answers, but to articulate a better set of questions. Answers in the archives—in the form of documents—always abound; the real difficulty is in figuring out what questions to ask of them” (King 2016).

Despite the early professionalization of history, methods of historical research often receive little attention in the teaching of history at postgraduate institutions or within scholarly publications, with the exception of economic and demographic history where quantitative methods are frequently used (Faire and Gunn 2016). This is for a number of reasons. Qualitative methods in history are often taken for granted, with students either learning through apprenticeship (e.g. through research assistantship positions), or, simply “by doing,” through visiting archives and learning their particular information management systems. As each archive is slightly different, it is difficult to teach one standard methodology of research. Additionally, scholars often assume that their references are a sufficient demonstration of their methodologies. In graduate programs, students read a high volume of recognized scholarly works; it is expected that by performing rigorous critiques of published texts, students will learn which practices to mimic, and which to avoid. Moreover, research and writing are iterative practices, with multiple drafts of a work receiving critiques by a supervisor, colleagues, blind reviewers, research ethics boards if applicable, and the author(s) themselves. If these mechanisms of critique are operating effectively, faults in methodology are identified early enough that they can be rectified.

## **USES OF HISTORICAL METHODS IN A MULTI- AND TRANSDISCIPLINARY CONTEXT**

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locations such as museums, or write publications aimed at a popular audience. There are also “amateur” or community historians, who may not have taken postgraduate degree, but nonetheless become skilled at the methods of historical research.

<sup>5</sup> An archival *fond* is defined by the Society of American Archivists’ Dictionary of Archives Terminology as “the entire body of records of an organization, family, or individual that have been created and accumulated as the result of an organic process reflecting the functions of the creator” (Society of American Archivists 2023).

Though the growth of transdisciplinary and multidisciplinary approaches are viewed as somewhat recent phenomena, the use of historical methods within a variety of scholarly disciplines is a longstanding practice going back to the nineteenth century (Weber 1927; Schumpeter 1954). Many researchers who are not necessarily trained as historians employ what might be termed “historical thinking” in their research.<sup>6</sup> For example, it is quite common for a social scientist to use an historical case study as a demonstration of the accuracy of their particular theory or model of societal change.

Historical methods have already been employed in many fields, including those studying fisheries from either a social or natural science perspective. As multidisciplinary and transdisciplinarity have become popular, historical methods have helped to bring natural and social science research together.<sup>7</sup> Additionally, while the foregoing section described history as it is “usually done,” this does not mean that historical methodologies and methods are static or inflexible. Inspired by the digital humanities, historians have also broadened their own methods through the use of technologies designed for other purposes, such as the creation of databases or the use of Geographic Information Systems (GIS). Though not comprehensive, this section will also demonstrate the ways in which historical research can be adaptive to different needs.

## **THE USES OF HISTORICAL METHODS IN FISHERIES RESEARCH**

Fisheries research has often had a tendency toward historical thinking, and in many cases, use historical methodologies and methods as well.<sup>8</sup> Many natural scientists are concerned with an interest in stock abundance, and many social scientists have an interest in fishers and their communities; yet a common preoccupation of both areas of research is the knowledge that the current stock status level of many fisheries are pale reflections of their previous states. This is often attributed to anthropogenic factors including overfishing or habitat alteration (Ludwig et al 1993; Pauly and MacLean 2003). Using historical documentation to supplement the investigation of past resource abundance is one of the dominant areas where historical methods have been utilized in fisheries science (Diemling and Liss 1994; Hennessey and Healey 2001; Pitcher 2001). Fisheries research often attempts to model species/populations abundance that are either currently or have been recently highly exploited, leaving a great deal of uncertainty as to the abundance of the stock prior to modern levels of high exploitation. The desire to estimate a robust baseline for a healthy stock in order to set limits on fishing, therefore, adds an impulse to understand the historical trajectory of a given desirable species. Historical data sets (timeseries) are widely employed in fisheries sciences for this purpose.

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<sup>6</sup> The term “historical thinking” is usually used in a slightly different way than used here, most often within the context of pedagogy within history (e.g., see the articles described within a special issue of the Canadian Journal of Education (McLean et al 2017).

<sup>7</sup> Multidisciplinary has been defined as “subprojects linked loosely by a topic or a common problem setting, or as a juxtaposed combination of expertise to produce new knowledge, without significant interaction between disciplines.” Transdisciplinarity is “increasingly seen as a hybrid of scientists and stakeholders, science and practice, and scientific and nonscientific knowledge” (Haapasaari 2012).

<sup>8</sup> This section will not examine a historiography of fish and fisheries, of which there is a substantial body of research, even reaching into the popular history market and becoming bestsellers (Kurlansky 1998).

Such use and interpretation of historical data sets appear within this series of Canadian Technical Reports and in reference to Lobster. In 1980, Alan Campbell and David Duggan reviewed the Grand Manan fishery, examining landings, values, effort, and regulations from 1877, using this information to produce biomass estimates and to gauge the increase in exploitation rates from 1948 to 1980. In 1992, Anne Williamson undertook the major task of determining historical Lobster landings for Atlantic Canada from 1892 to 1989 (excluding Newfoundland until 1956). Williamson uses a variety of historical data, including from Statistics Canada, Fisheries Inspectors' Reports, and for more recent years, from data held within DFO. Particularly for the early years of the fishery, Williamson needed to create a conversion factor to estimate landings data based on the published data for weights of canned Lobster, which initially was the largest part of the Lobster market, as a proxy for how many Lobsters were being taken from the water. As such, the data are estimates, but are nevertheless highly useful.

Though the historical methods used within the Williamson technical report are limited to the acquisition of data, there is a reasonable argument to be made that one of the lynchpin methods of historical research – source criticism - would have improved the validity of her findings. A knowledge of the historical context of the Lobster fishery provides key information about the inability of the Canadian government to enforce the Lobster regulations. As a result, illegal and black market activities proliferated for decades, often driven by the canning industry (Morton 2019, 241).<sup>9</sup> The statistics held by the Dominion Bureau of Statistics and its later iterations did not account for that black market. Therefore, Williamson's landings data for at least the first half of the twentieth century are probably much lower than what was actually landed.

The use of hindcasting is another example of where historical thinking has been implemented within the context of fisheries research. It is a practice wherein models are tested against historical data sets to verify the predictive power of the model. It has been used to understand increases in wild marine fish catch, or to better understand biological processes with an eye to improving management practices (Galbraith et al 2017; Morales-Muñiz et al 2018). Combining the use of historical data sets with Indigenous and local knowledge has also been found to be highly useful. Interviews with fishers, or use of Local Ecological Knowledge (LEK) or Traditional Ecological Knowledge (TEK) can help to unlock historical knowledge or verify other types of data (Murray et al 2007; Martínez-Candales et al 2020; Whalen 2004; Higdon 2010).

While the modelling techniques are statistical in nature, the data is historical, and may be held in text-based sources that are not easily available through modern online search techniques. As digitization of text can be cost prohibitive, there may be extensive collections of historical data that are simply not available online. Here, historical methods are of value, given that many today rely solely on digitized sources. Librarians, archivists, and other experts in information management can also be conduits to such data.

## **THE USE OF NON-TRADITIONAL METHODS WITHIN HISTORY**

While other disciplines may have integrated the methods of historical research, history has also absorbed the methods of other disciplines. For example, studying history using quantitative

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<sup>9</sup> Though we are using the terms “illegal,” and “black market” which have negative connotations, these activities should be put in the context of highly rural societies where such regulations were sometimes new and where fishing was prosecuted as a supplementary activity. Oftentimes such activities may not have been within the letter of the law, but received *de facto* approval from their communities.



techniques, sometimes referred to as “cliometrics,” or econometric history, which uses “economic theory and quantitative techniques to describe and explain historical events” has been a methodological specialty since the 1960s (The Cliometric Society 2018).

More recently, historians have begun to adapt technologies developed for other disciplines for historical purposes. Though the use of computers to conduct the type of analysis described above has been employed since the 1960s, the term “digital humanities” has been in usage since 2005 (Nyhan et al 2013). Databases can be employed to keep track of a variety of information (e.g. hospital records, census data) and allow for efficient searches and analysis of such data. Though more basic, Excel spreadsheets have become almost universally employed by historians to keep track of various types of data. As the late historian R.J. Morris describes, the major skill employed by historians in doing this modern work is a very old historical method: source criticism (Morris 2016). While anyone might be able to transfer data from the written page to a spreadsheet or database, how to interpret the information “demands an understanding of the circumstances of the document,” which is one of the major skills that historians offer (Morris 2016).

Another software widely adopted by historians and others in the humanities are GIS-based software. While maps have long been an important visual communication tool for historians, GIS has the further advantage of being able to integrate “data from different formats by virtue of their shared geography” (Bodenhamer et al 2010). By easily visualizing various types of data within a specific geography, historians can explore the spatial patterns of a specific phenomena. Thematic mapping, for example, by linking historical health statistics to spatial regions, allows for original insights: “by doing so, certain patterns emerge from historical data sets that are not immediately apparent until they are mapped out (Lilley and Porter 2016).” GIS has also been used in transdisciplinary work within a fisheries research context to help incorporate fisher knowledge and triangulate different forms of data (Barnett et al 2016). As shown later, this tool has been of great benefit to the BELT by allowing the researchers to map out changes in historical Lobster fishing districts over time.

## **BELT TEAM WORK AND HISTORICAL METHODS**

There are three main ways that historical methods have been used within the work of the BELT. These are to inform the work of conceptual modelling by providing subject matter expertise, giving background and context to inform engagement work with fishing organizations, communities, and associations, and to build an historical timeline of the Maritimes Region Lobster Fishery. Related to this second objective, the BELT began the work of compiling historical data sets, primarily through the construction of maps representing changes in Lobster districts since 1899. We will briefly describe the first two projects but will primarily focus on the third.

### **CONCEPTUAL MAPPING**

As outlined in previous technical reports by the BELT (Pourfaraj 2022 et al., a, b), the BELT has undertaken a conceptual mapping exercise for the Maritimes Lobster fishery, named “An Interactional Map of the Social-Ecological System for the American Lobster Fishery in the Maritimes Region,” or IMSES. As outlined in these two technical reports, so far the conceptual map has relied upon subject matter expertise to identify the model components and determine their linkages. The individuals who have contributed to this model came from a variety of backgrounds within DFO, including from the natural sciences, policy and resource management

backgrounds. They also included the members of the BELT, including natural and social scientists and a historian. Many of these subject matter experts had familiarity not only with the present state of the Lobster fishery but its past as well, informing their contributions to this work. As of the publication of this report, the model is in a draft form and requires the additional contributions of experts outside of DFO, as well as Rightsholders and stakeholders, to include a broad objective of different perspectives to make it a more useful analytical tool.

Much of the work in determining model components and linkages for the IMSES relies on assumptions not only about the natural world and the behaviour of Lobster, but also expected behaviour of fishers and their economies and communities within the context of a specific change or pressure. Anticipating such behaviour is based primarily on knowledge of how those factors influenced the Lobster fishery in the past. As such, a comprehensive knowledge of the history of the Lobster fishery and how it has responded to prior pressures is essential to informing the construction of this model.

## **BACKGROUND AND CONTEXT FOR ENGAGEMENT WORK**

Parlee et al (2023) outlines the social sciences and humanities research that the BELT undertook to gain insight into changes in fishing practices over time and objectives for the Lobster fishery in the Maritimes Region. As part of this work, the researchers engaged with Indigenous and non-Indigenous organizations, communities, and associations connected with the Lobster fishery. As many of the issues raised during these engagement sessions referred to issues with multigenerational implications or referred to decisions made by DFO many years ago, a knowledge of the history of the Lobster fishery helped to prepare the researchers to have informed conversations.

## **HISTORICAL TIMELINE**

Another major component of the historical aspect of the BELT's work has been the development of an evergreen historical timeline for the Lobster fishery. There are three major components of the timeline, with the first two relating qualitative information. The first is a narrative exploration of the history of the Indigenous relationship to Lobster since time immemorial. Though stock assessments within DFO are concerned with commercial fisheries, the evolution of recognized treaty-based fisheries within the last two decades in the form of "Food, Social, and Ceremonial (FSC)" and "Moderate Livelihood" fishing has created new categories of fishing within the regulated Lobster fishery. The context for these treaty rights is intrinsically tied to the history of the Mi'kmaq, Wolastoqey, and Peskotomuhkati peoples in this region.

At present, the stock assessment practice does not explicitly benefit from this type of qualitative historical knowledge. However, such an understanding would be consistent with the DFO-Coast Guard Reconciliation Strategy (DFO 2019). This strategy states that DFO-Coast Guard commits to "Recognize and implement Indigenous and treaty rights related to fisheries, oceans, aquatic habitat, and marine waterways in a manner consistent with section 35 of the Constitution Act, 1982, the United Nations Declaration on the Rights of Indigenous Peoples, and the federal Principles Respecting the Government of Canada's Relationship with Indigenous Peoples." Further, it includes the acknowledgement of "the historic relationship DFO-Coast Guard has had with Indigenous peoples" as a "Guiding Principle" for this strategy. Though a complete record of the Mi'kmaq, Wolastoqey, and Peskotomuhkati history with Lobster is far beyond the scope of this project, a grounding in some of the major themes that arise from historical research into this topic for DFO employees is in line with DFO's reconciliation strategy. Moreover, the

acknowledgement of this history is its own form of respect, which is part of the Federal commitment to Reconciliation (DFO 2019).

The reason that this portion of the timeline is narrative rather than a “date - event” format is that pre-contact records are recorded through oral tradition, prior to the introduction of Western methods of date keeping. Even following European contact, there are few specific acknowledged dates that shaped this history prior to the nineteenth century. Perhaps more importantly, though, much of what is relevant to this history is shaped by Indigenous perspectives and worldviews which do not lend easily to a “point-form” description.

The second qualitative aspect of the timeline is a more standard type of timeline of the Lobster fishery, following a “date - event” format. This timeline keeps track of important events, Commissions, legislative and regulatory changes, technological improvements, and other items of relevance to the Lobster fishery in the Maritimes Region. Unlike many other timelines used for public history purposes, this timeline is not designed to be concise. Rather, it is designed to be a searchable repository of information for stock assessment scientists and others within DFO to quickly find answers to questions about the history of the Lobster fishery to inform their work. We are considering the applicability of tools such as Microsoft Sway, Google sites, and flexdashboard package of R as evergreen repositories for this research.

As an evergreen document, the Historical Timeline will continue to evolve and grow as more information and more historical data becomes available. It is crucial that such a resource be well referenced so that users will be able to find the primary source material. An advantage of using a platform such as Sway is that links are easily embedded, so that if a particular source is available online, it can be linked directly to the website. As a result, it allows for multiple forms of information to be included, including maps, audio recordings, and written content. These two qualitative aspects of the historical timeline can be used as tools to answer questions about the Lobster fishery without needing to do further research, whether it is to quickly verify a fact, or to learn about the fishery in a more comprehensive way. It could also be used as a training tool to communicate institutional knowledge about the Lobster fishery to new members of the LEAT to help them gain an understanding of the fishery. It could be shared with other Regions in Atlantic Canada for this purpose as well.

Though the broader timeline has been designed for internal uses, it would also be possible to pare down the timeline to a more easily accessible public-facing version. Such a version would require input from DFO Communications and require translation. As a result, it is not within the scope of the research timeline that we currently have within this project.

## **TRACKING LOBSTER DISTRICTS OVER TIME: METHODS**

The first step to using historical data is compiling it. The LEAT had already begun a “data rescue” project that they had largely undertaken during 2021-22, though it continues to be an ongoing initiative. This involved the digitization of a large number of paper documents held within DFO Science relevant to Lobster, and the development of a database to search for information using tags. This has made previously unusable and unorganized paper copies of data searchable and potential use for the Lobster team, and has consolidated the historical Lobster-related data available within DFO Maritimes. Also, some members of the LEAT had already compiled relevant historical data in the preliminary version of the historical timeline.

When the researchers began this project, it was decided that the timeline should include visual aspects to represent historical quantitative data, and that it would be easiest to begin compiling visual representations of data that were already accessible. Early on, it became clear that one of the major challenges of compiling historical data is that currently, the stock assessment process disaggregates data by LFA. However, LFAs and Lobster districts have not been consistent over time, making tracking historical data in this way more challenging. Anne Williamson tackled this problem in her technical report by disaggregating landings in several different ways, including by county, which the original Lobster districts were largely based upon, and by creating “approximate” Lobster districts where changes had been made (Williamson 1992). Nevertheless, it was important to gain a baseline understanding of how Lobster districts evolved over time, in order to understand how visual representations of data could be best created.

As this mapping project proceeded, the researchers found that mapping these changes had implications beyond helping to interpret and depict historical quantitative data. The results help to inform a larger understanding of the historical Lobster fishery in the Maritimes. The changes in maps tells a visual story about territoriality in the fishing industry, the negotiation between regulators and fishers, and the extremely local forces acting upon the Lobster fishery despite its ties to global economic markets. It demonstrates the degree to which Lobster fishery regulations evolved yet remained tied to a system of geographical boundaries from almost the beginning of Lobster fishery regulations to the present day.

The boundaries defined in this report are *not meant to represent areas where DFO or its predecessor departments had complete or authoritative control of the inshore fishery*. Indeed, particularly in the early years of the Lobster fishery, as noted earlier, the Department of Marine and Fisheries struggled to enforce all types of Lobster fishery regulations. Rather, the maps are meant to represent Lobster fishing districts in a manner that allows the viewer to easily identify Lobster districts relative to current LFAs. This is particularly relevant to the outer boundaries chosen for these maps. The boundaries do not reflect the areas where DFO had control nor even where fishers were likely able to fish given their technological limitations, which will be discussed later in this report. Until 1964, international territorial and fishing limits were based on a three nautical mile limit (“the range of a cannon-shot”), though the extent to which individual fishers adhered to this boundary is uncertain (quoted in Baty 1928, 504).<sup>10</sup> However, as the legend on the first 1899 map demonstrates (figure 1), a three mile nautical limit would be quite difficult to represent, or see, on a map of this nature. In 1964, due to the dramatic increase of foreign offshore fishing trawlers, Canada unilaterally declared a partial twelve mile fishing limit, and fully implemented it in 1969. By 1977, the third International Law of the Sea conference allowed for an internationally-agreed upon 200 mile limit, which combined with better fishing technology, set the stage for the greatly extended fishing boundaries represented in the 1985 map (figure 13) (Wright 1997).

Earlier examples of maps from DFO (or its predecessor departments) tend to use graphical elements, such as diagonal lines, to represent the areas described in regulations as “on and along the coast” that defined boundaries (e.g. DeWolf 1974, 22). For this report, modern GIS software allowed researchers to create visually compelling polygons (i.e. for each LFA). The maps therefore have boundary lines that are ahistorical as the outer boundaries do not

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<sup>10</sup> Indeed, Suzanne Morton points out that a 1913 Department of Justice decision ruled that PEI fishermen could set their traps out of season more than three miles offshore as there was no federal jurisdiction (decision can be found in Department of M&F, 1910-1913, RG13, Justice, Series A-2, vol. 2365, File 1913-691, LAC). Personal communication with Suzanne Morton, March 21, 2023.

represent prior fishing behaviour or international law, but allow for the easy identification of which coastal areas were implicated in the regulations.

Earlier maps (such as the 1899 map in DeWolf cited above) were used as guides that helped to establish precedents (for example, about the directionality of lines where none were established in the regulations). However, sometimes this was not appropriate. For example, DeWolf's map draws the division line between districts 4 and 6 as running from the line dividing Inverness and Victoria Counties. The map in this report (figure 1) uses the description in regulation which specifies the boundary line as from Cape St. Lawrence, slightly west of the county line. As a result of these types of differences, readers may observe that the boundaries in this report depart slightly from earlier published maps.

The researchers began with an 1899 start date as this represents an important historical juncture in the history of Lobster regulations (figure 1). Fishing regions had been defined before. Previous versions of regulations had specified entire provinces (Quebec, Nova Scotia, and New Brunswick in 1873, as PEI only joined Confederation that year) in reference to regulations protecting berried female and small Lobsters. In 1879 the regulations defined two fishing seasons by dividing the Bay of Fundy and eastern Nova Scotia from the Gulf of St. Lawrence. However, in 1898, the federal government held a Canadian Lobster Commission which recommended the creation of five seasons, defining the geographical ranges that would make their way into the regulations. They argued in favour of these areas because the two previous seasons had required "repeated extensions" and so "these two seasons were not perfectly applicable to local conditions in every case..." (Prince 1898, 29). The researchers decided to begin in 1899 as this was the first year the fishery was divided into different geographical areas in order to reflect these "local necessities," and is therefore the origin of the modern Lobster Fishing Area.

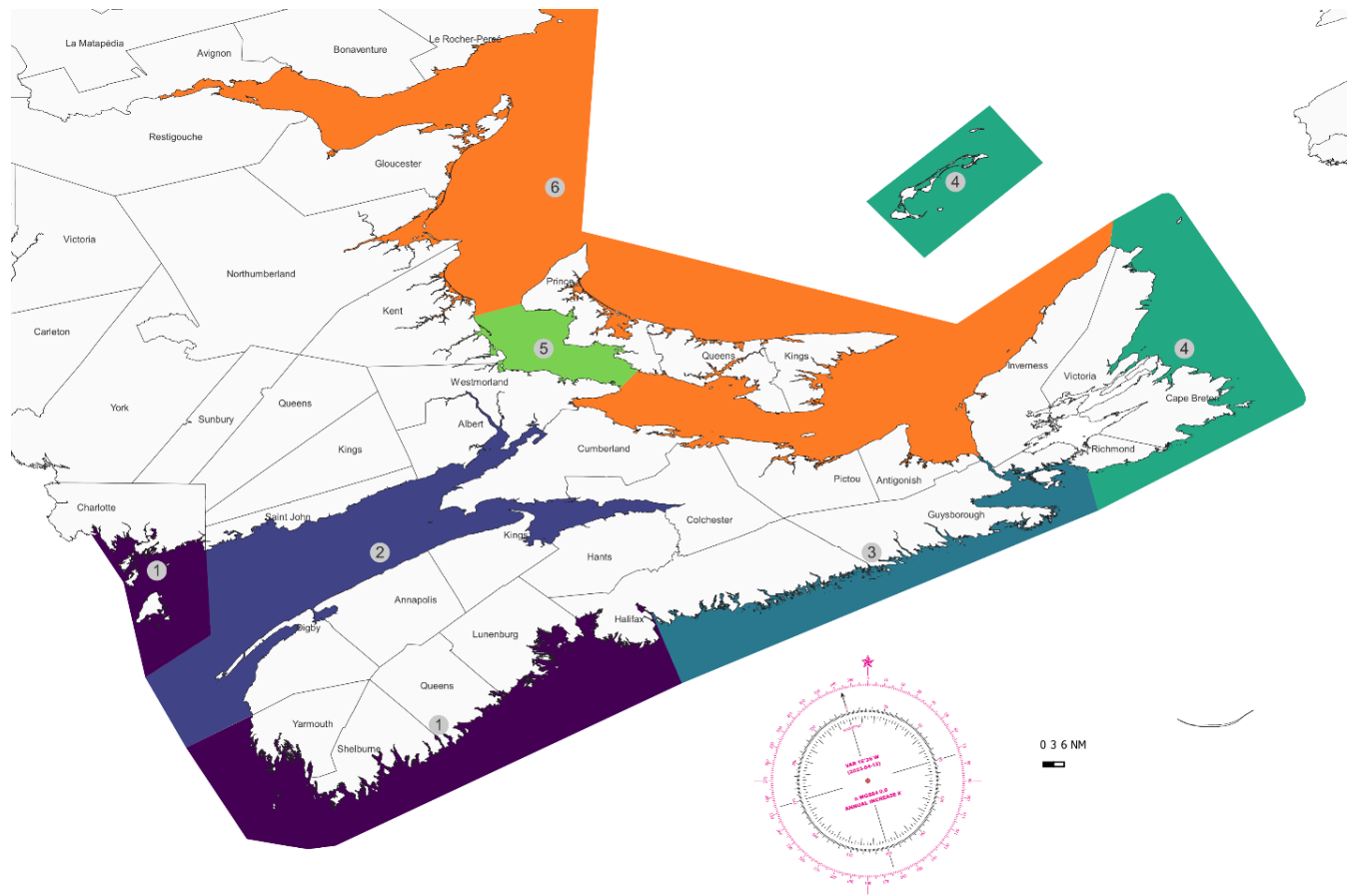


Figure 1: 1899 Lobster fishing district boundaries. District 6 was not defined in the regulations. The scale legend shows the distance of the internationally-accepted territorial and fishing boundary for this time (three nautical miles).

In order to create these maps, the researchers searched the Collections Canada website (Government of Canada 2023) filtered by “Canada Gazette: 1841-1997,” a database of all the published *Canada Gazette* documents within those dates. As the system has an eccentricity that the search software does not recognize the letter “o” in the scanned images of the regulations, we searched the term “lbster” to populate Orders in Council that contain the term “Lobster.”

Given that the Lobster fishery regulations were scanned as images, it is impossible to copy and paste the text. Therefore, the researchers made the decision to transcribe the changes in an Excel spreadsheet. This was necessarily a time-consuming method of work but typical of historical methodologies, which are frequently laborious due to the historical use of paper technologies.<sup>11</sup>

<sup>11</sup> Optical character recognition (OCR), a method that creates a digital recognition of image files of words within PDFs, could have been employed within this work. Though it may have proved more timely to use OCR, transcription has the additional benefit of forcing the researcher to pay close attention to the text, and retain and notice information as the transcription progresses. This makes the time invested worthwhile.

Major changes were defined as points within the Lobster regulations when they were repealed wholesale and replaced with a new set of regulations that reflected ongoing amendments in the previous years. The disadvantage of this approach is that the transcribed regulations do not necessarily tell the reader when it was introduced originally as an amendment, but rather when it was introduced within a wholesale replacement of the regulations. However, given the large number of search results (839), this was necessary in order to complete the project. This method also does not include some items of interest that may be included in amendments but not in the wholesale rewrite. For example, the researchers noticed that in 1925, an amendment noted that:

Whereas representations have been made to the Minister of Marine and Fisheries reports that the method of determining the size limit for Lobsters in Charlotte County, N.B., is not very clearly defined, and that representations have been made by the fishermen of the county, supported by the Inspector of Fisheries, that the measurement should be made from the rear of the eye socket to the rear end of the body shell as definite points (Fisheries Act, Lobster Fishery Regulations [hereafter LFR] 1925)...

This amendment is interesting because it not only shows *what* the regulatory change is, but also allows insight into *why* the change was made, and the social, cultural, and political factors at play. This interesting detail is missed by only looking at times when regulations were repealed and replaced. Despite this concern, time was a limiting factor in conducting this work, and reading all amendments was beyond the scope of this research. Also, much of this contextual work can be found in secondary sources. The researchers found 13 major changes in regulations between 1899 and 1985 (inclusive of those years).

Once the regulations had been transcribed, the maps needed to be created based on the narrative geographical descriptions from the regulations. Until 1985 with the publication of maps and corresponding longitude and latitude coordinates under the Atlantic Fishery Regulations, districts were determined in the regulations narratively, i.e., through the use of geographical descriptions with words. Until 1954, the districts were numbered based on the regulation number that described their geographical boundaries. In 1954, this changed, and the regulations specified the titles of the Lobster Districts ("Lobster Fishing District no. 1," etc.).

The 1907 regulations clarified the strange grouping of Grand Manan and Charlotte County with the South Shore of Nova Scotia (figure 2), and merged these areas into the rest of the Bay of Fundy.

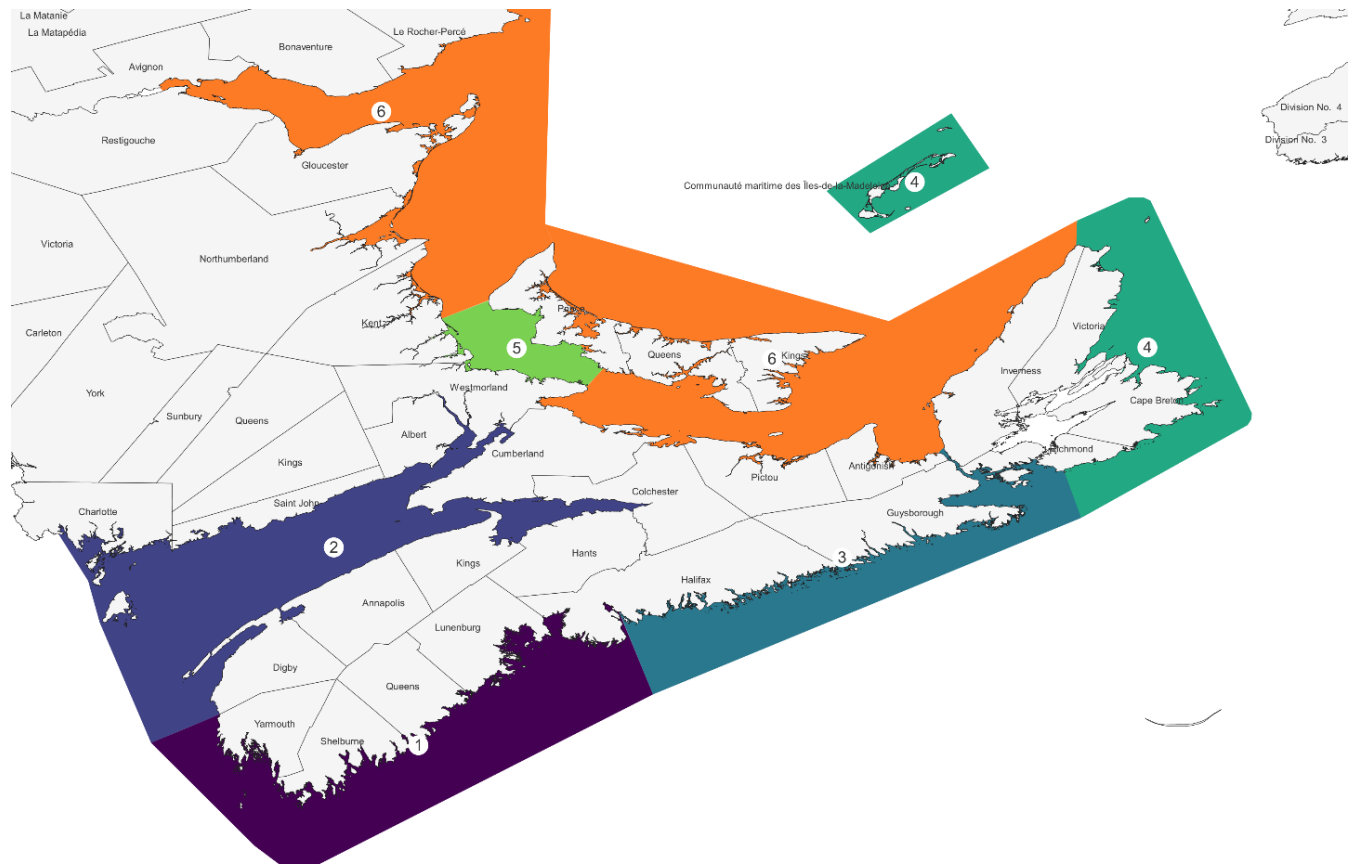


Figure 2: 1907 Lobster fishing districts

But this simplification did not endure, and the narrative descriptions grew increasingly complicated throughout the first decades of the twentieth century. For example, from 1934 (figure 3), the description of district 7 reads as follows:

Except in that portion of the Strait of Northumberland between a straight line on the northwest drawn from Chockfish [Chockpish] river, New Brunswick, to Carey Point, Prince Edward Island, and a straight line on the southeast drawn from the west side of River Philip channel at the mouth of the river, Nova Scotia, to the eastern entrance to Victoria Harbour, Queens County, Prince Edward Island, and from the said eastern entrance through Victoria Harbour to the end of the Government wharf at Victoria...on and along that portion of the coast or the waters thereof of the Provinces of Nova Scotia, New Brunswick and Prince Edward Island, from Delaney's beach, Inverness County, Nova Scotia, southwardly, westwardly and northwardly following the coastline to the northern boundary of New Brunswick, including the coast and waters thereof of all the islands adjacent to these portions of the coasts of the said provinces, as well as the coast and waters thereof of the Counties of Quebec, south of the river St. Lawrence, excepting the Magdalen Islands; also the Strait of Canso down to a straight line drawn east-southeast magnetic from Cape Argos, Guysboro County, Nova Scotia, and the portion of the coast and waters thereof, and of the islands adjacent thereto, of Richmond Couty, Nova Scotia, that is westward of a line drawn due south, magnetic, from Indian Rock, off Point Michaud, also the waters of Bras d'Or lakes south of a line drawn from Irish Cove, Cape Breton County, to Alba, Inverness County (LFR 1934).



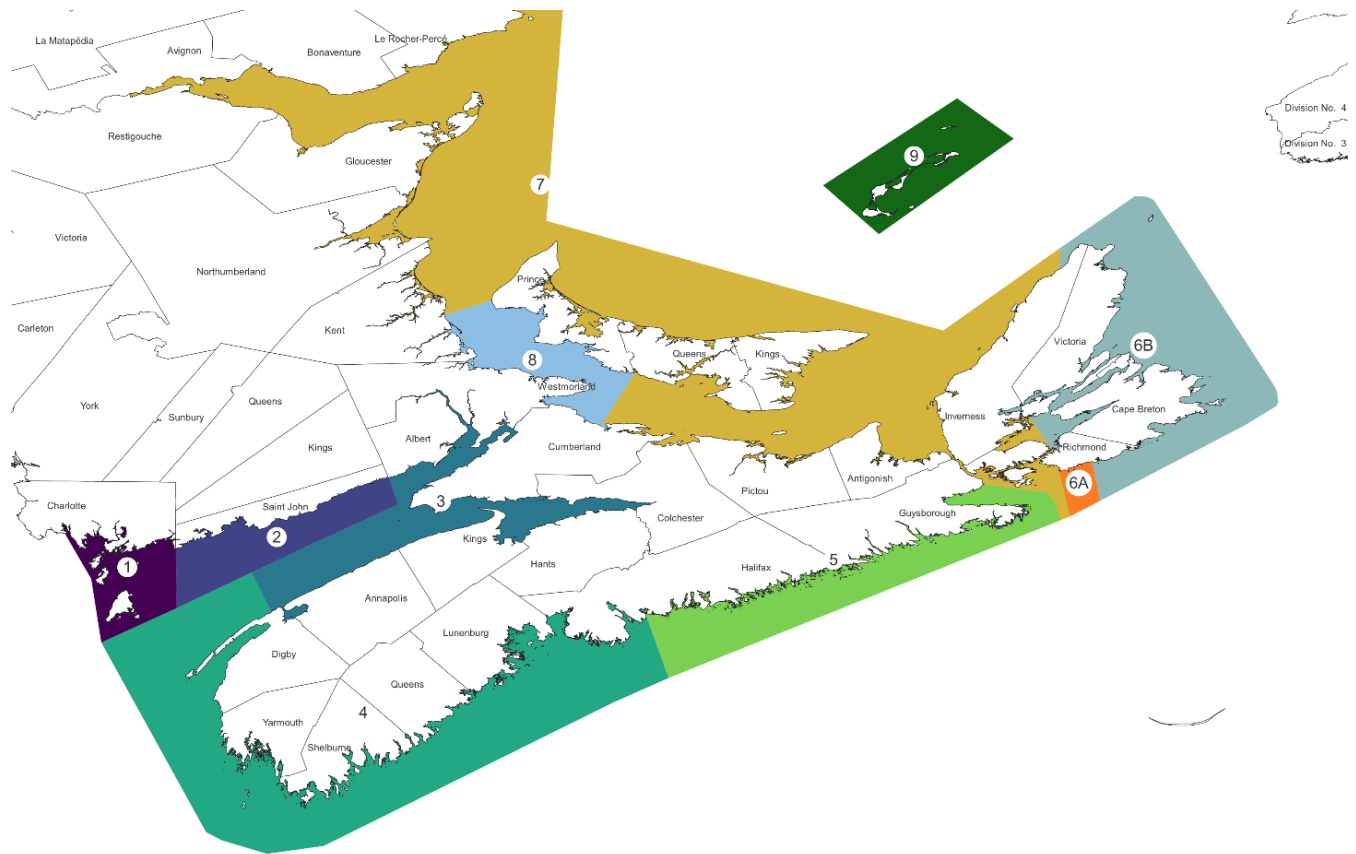


Figure 3: 1934 Lobster fishing district boundaries

This lengthy example, which is one of the longer descriptions from the regulations, is provided to illustrate some of the methodological challenges faced in interpreting these descriptions. One obvious challenge is that the multiple clauses make for difficult reading. Another challenge is that some of the named locations of division lines no longer exist on modern maps. For example, Delaney’s Beach is not found on the Nova Scotia Atlas, the most detailed published map of Nova Scotia. In cases such as these, if the location could not be sourced from an earlier district map, the researchers consulted those with local knowledge and used logical inferences and contextual information to determine the location. Though Delaney’s Beach does not appear on modern maps, consultation with the Nova Scotia Atlas showed that there is an Upper and Lower Delaney’s Brook, and a “Delaney’s Point,” on the northwest side of Cape Breton Island, close to Cape Saint Lawrence. The lead researcher contacted a fisher within Bay St. Lawrence who confirmed that decades ago their grandfather had been permitted to fish in that area. The present-day boundary line is slightly north of Delaney’s Point. Based on this combined information, the researchers concluded that Delaney’s Point was likely the marker. Another avenue would have been to find detailed maps from that era, but the researchers were unable to invest the time into this approach.

Other descriptions were simply difficult to interpret. For example, from 1918 (figure 4), the regulations stipulated that the boundary division on the Northumberland Strait in Nova Scotia was at “a straight line on the southeast drawn from the west side of River Philip channel at the mouth of the river Nova Scotia.” The nuance of this was likely clear enough to local fishers, but difficult for the researchers to interpret. Finally, in 1963 (figure 5) the regulations provided a more detailed description of how this boundary divided Pugwash Harbour through longitude and latitude coordinates. The researchers then “backdated” this line to 1918, as the meaning of the “line on the southeast” became clear. Another example of such “backdating” occurred with the southward direction of boundary lines in Richmond County. In 1940 (figure 6), regulations stated that the boundary lines were to be drawn “due south magnetic.” The researchers decided to apply this direction to earlier maps as well to maintain visual consistency.

To determine the boundary-line direction of areas where either astronomic or magnetic direction is assigned by the regulations, the researchers used “Magnetic Declination” (a plugin in QGIS) which draws a compass rose accurate to the position on the globe where it is placed based on the NOAA National Geophysical Data centre (QGIS Python Plugins Repository n.d.).



Figure 4: 1918 Lobster fishing district boundaries

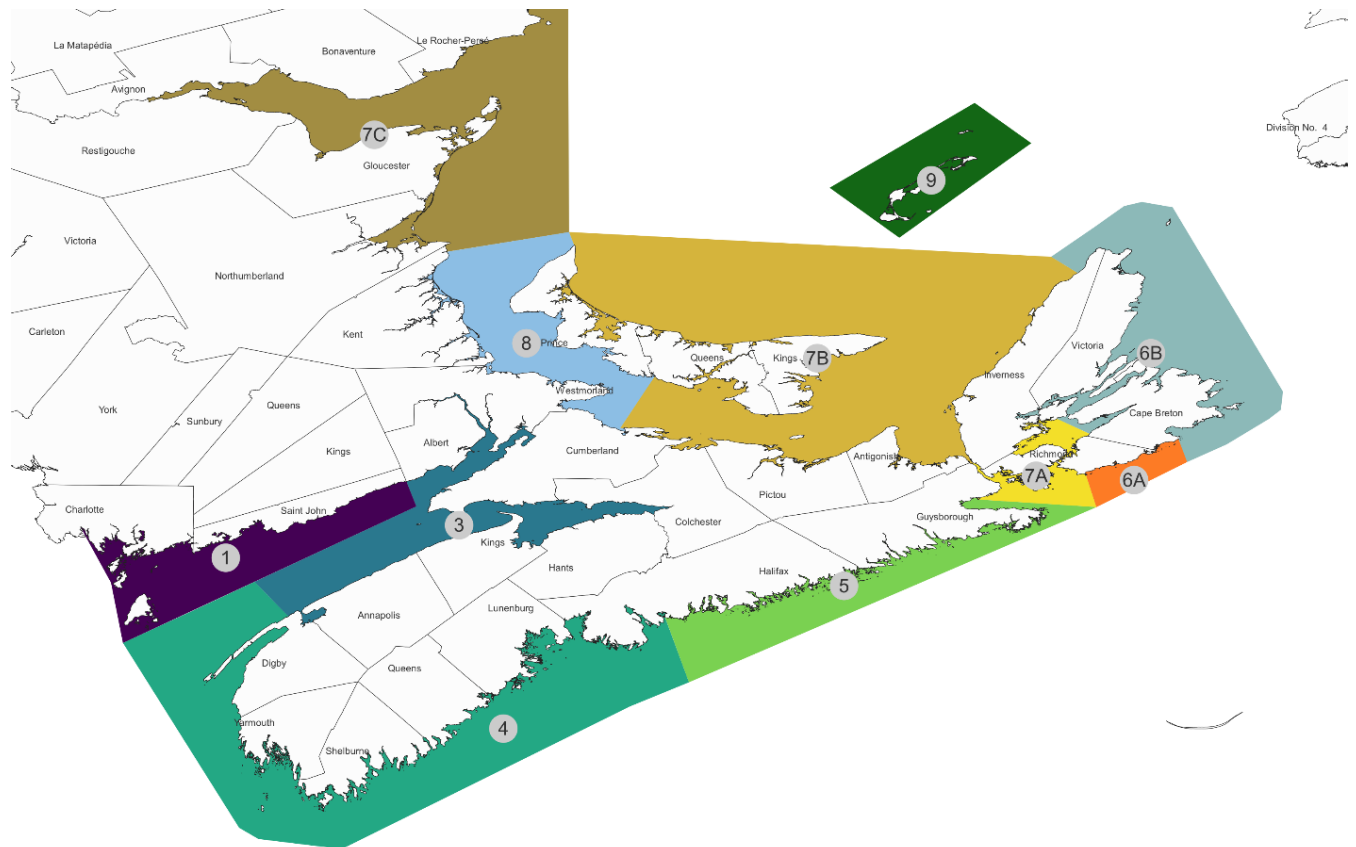


Figure 5: 1963 Lobster fishing district boundaries. The area off of High Capes (the division between 6B and 7B on the western cape of Cape Breton) was defined as 5 nautical miles off the coast.

These descriptions also lacked a defined outer boundary. The districts were always framed as “on and along the coast.” This meant that the researchers had to often make arbitrary decisions about where to cut off and divide boundaries, and also how far out to extend boundaries off the coast. As noted above, for the offshore boundaries, the researchers assigned boundary lines that made the maps visually comprehensible, rather than corresponding to any particular metric of where DFO or its predecessor departments had regulatory control or where fishers typically fished. At times, boundaries were assigned based on aesthetic judgements (e.g. showing the divisions in the Bay of Fundy at approximately the halfway point between the coasts of Nova Scotia and New Brunswick). Most of the offshore estimates are far beyond where fishers would have been fishing in earlier eras.

Once the researchers had determined the geographical division lines between Lobster districts, using paper maps to keep track of these divisions, they began the process of transferring these into the QGIS software. QGIS is a free and open-source software that allows analysis and editing of spatial information. It also enables users to load raster and vector layers as well as exporting maps among other features. The researchers used QGIS Desktop 3.22.0 as the main tool for creating maps of Lobster districts through time. For that purpose, researchers downloaded county shape file form Statistics Canada website and used it on top of the ESRI base layers (available on QGIS) to create maps of Lobster districts (Statistics Canada 2023).

Using Add polygon tool of the software, researchers could draw polygons based on the geographical description, save it under a new layer and make changes to the colors and labels using a suite of options under layer properties. The final map could be easily exported as a PNG file and used for various purposes.

Even when latitude and longitude had been developed within the regulations, these maps continued to largely use as the basis the points determined from earlier narrative descriptions to maintain consistency. At times, the researchers did use GPS coordinates derived from latitude and longitude coordinates in the regulations, but this was not always needed in order to represent the broad outlines of the districts at this scale. These maps are not intended to be geographically accurate at fine scale, but rather, broadly represent the district-level divisions throughout time.

The data the researchers created for this project have been included within the Government of Canada's Open Data portal and will be freely available for use by researchers and the public (<https://open.canada.ca/data/dataset/b8550fde-fbfe-4556-a592-1ae972834b65>). By including it in the Open Data portal, the potential exists for the data to be also included within the Marine Spatial Planning Atlas in the future (<https://www.dfo-mpo.gc.ca/oceans/planning-planification/atlas/index-eng.html>).

## **RESULTS: TRACKING CHANGES IN LOBSTER DISTRICTS OVER TIME**

Though the work of creating these maps was initially motivated by an interest in understanding how to depict and interpret historical data about the Lobster fishery, the creation of these maps has become its own tool of historical analysis. Observing changes in districts over time, and seeing how new districts were created and eliminated, allows insight into a number of aspects about the historical Lobster fishery in the Maritimes.

### **INCREASINGLY INTENSIVE REGULATION OF THE FISHERY**

Careful observers may note that while the 1898 Lobster Commission only recommended five seasons, the 1899 map shows six districts (for all maps discussed in the following section, see Appendix I). This is because the first five regulations in 1899 specify different geographical areas, following the recommendations of the Commission's report. The sixth regulation applies to "any part of Canada or the coasts or waters thereof" (LSR 1899).

The researchers followed the precedent established by the 1899 map within an earlier DFO document by A. Gordon DeWolf and labelled this remaining area as District 6 (DeWolf 1974). Labelling these areas as districts is premature, as the regulations merely define the geographical areas but do not define them as districts until 1954. However, given the subsequent evolution of these areas into Lobster fishing districts, for the sake of consistency, the researchers labelled them in this way.

Despite not being defined as within a district, Lobster fishing took place in "district 6." Already in 1887, a commission to investigate Lobster and Oyster in Canada found that "the whole of coasts of the Lower Provinces, including the Magdalen Islands and excepting the upper part of the Bay of Fundy, are one continued lobster-fishing ground" (1887 Commission). Moreover,

three of the eight members of the 1898 Canadian Lobster Commission were from the areas covered by “district 6”.<sup>12</sup> By 1910 (figure 7) the regulations changed to define specific areas around Prince Edward Island, New Brunswick, and the Gulf Coast of Nova Scotia.

These changes reflect a greater degree of specificity within the regulations over the course of the twentieth century. While the 1899 Order in Council comprises less than two (non-bilingual) typewritten pages with eleven regulations that include the geographical boundaries of the districts, by 1974, the Order in Council was seven (bilingual) pages, including sixteen regulations with dozens of subsections not including the geographical boundaries. The boundaries are printed as part of a separate schedule, bringing the Lobster Fishery Regulations to a total of twelve pages.

The Lobster fishery, already highly regulated in the context of its time at the turn of the twentieth century, came under increased regulatory scrutiny by government as time went on. This scrutiny reflects an increasing confidence on the part of government about their capacity to enforce these regulations, as the responsible government departments became better resourced. It also reflects the sustained importance of the Lobster fishery to the region throughout the twentieth century.

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<sup>12</sup> Thank you to Dr. Suzanne Morton (McGill University) for pointing out this fact to the authors.

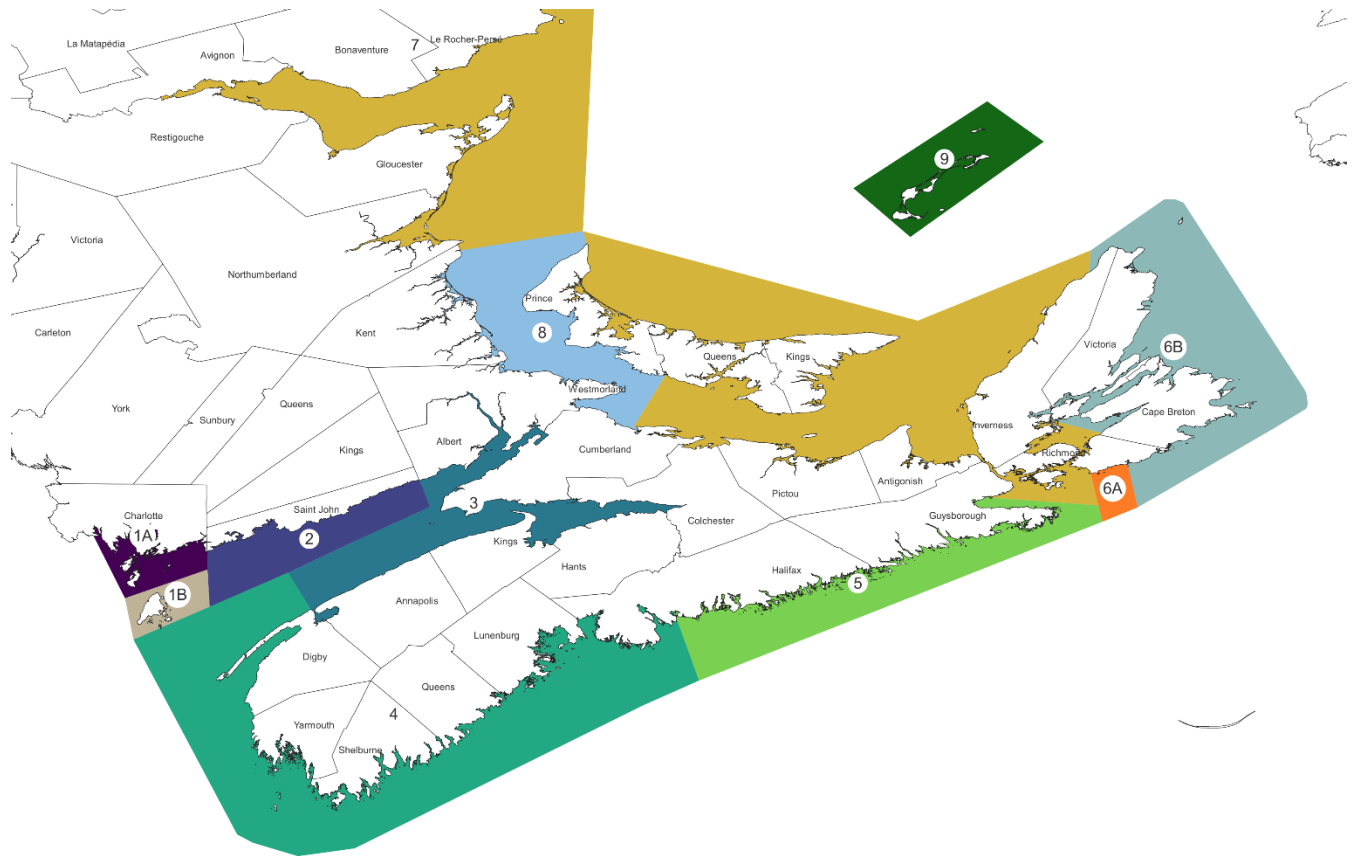


Figure 6: 1940 Lobster fishing district boundaries. The point north of North Head in Prince Edward Island was defined as 5 nautical miles.

## LACK OF OUTER BOUNDARY

For most the twentieth century, the regulations did not specify an outer boundary for Lobster fishing.<sup>13</sup> The fact that outer boundaries remained undefined well into the twentieth century is telling about the nature of the Lobster fishery itself and how it was prosecuted. A kind of outer limit emerged in 1940 (figure 6) when the regulations specified that for District 8:

...On and along the coast, or the waters thereof, of that portion of the Strait of Northumberland between a straight line on the northwest drawn from the north side of Eel river, Kent County, New Brunswick, to a point five marine miles north magnetic from North Point light, Prince Edward Island, and a straight line on the southeast drawn from the west side of River Philip channel at the mouth of the river, Nova Scotia, to the eastern entrance to Victoria Harbour, Queens County, Prince Edward Island, and from the said eastern entrance through Victoria Harbour, to the end of the Government wharf at Victoria...(LFR 1940, emphasis added)

<sup>13</sup> There was no official offshore Lobster fishery until DFO introduced the offshore Lobster District A in 1971, which delineated an area on the Scotian Shelf for Lobster fishing.

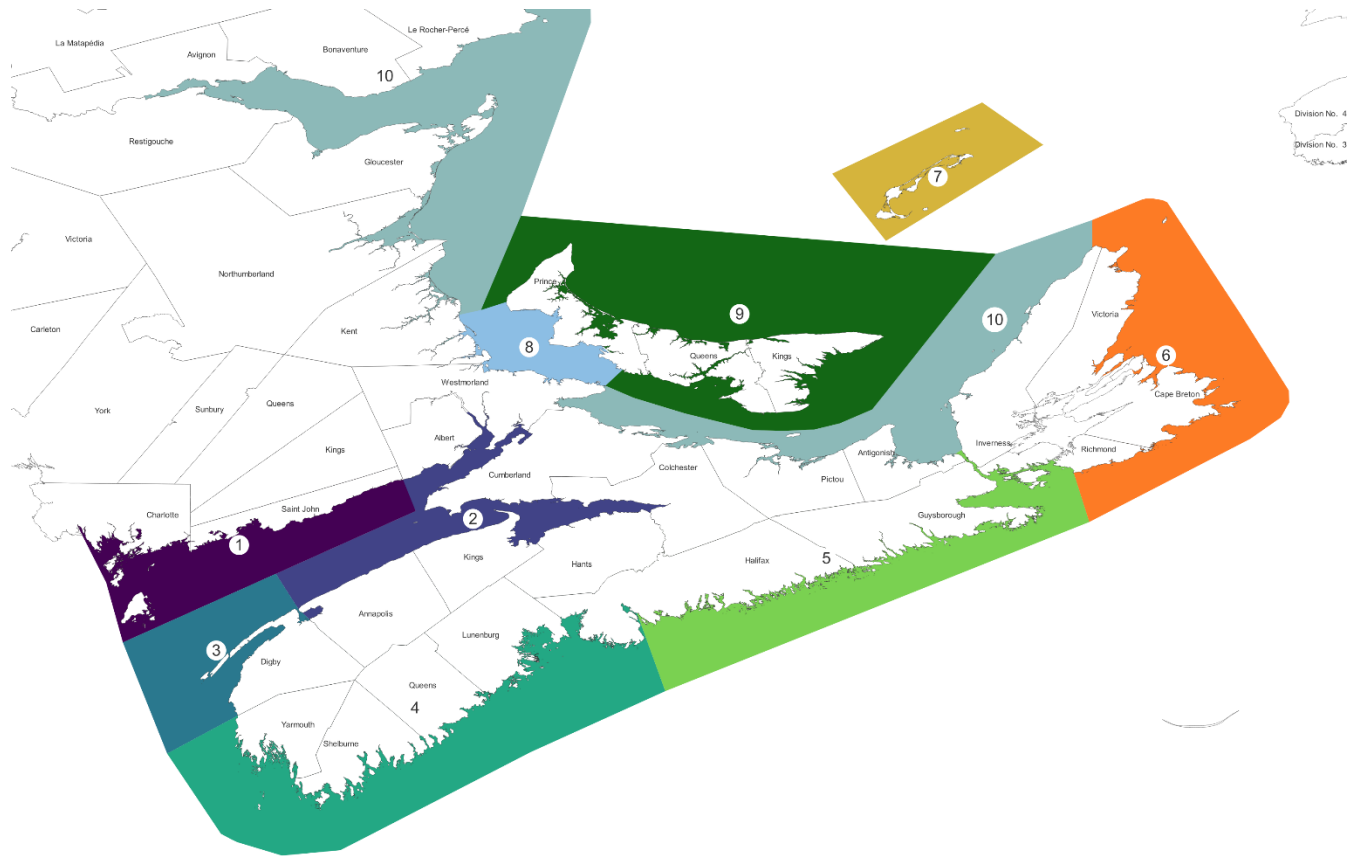


Figure 7: 1910 Lobster fishing district boundaries.

In 1963 the regulations used the same five-mile boundary to define an area off the coast of Cape Breton. Five miles, then, seems to have been considered the outside limit of Lobster fishing, but was rarely specified. The five-mile boundary also shows the extent to which the supposed three-mile international boundary did not reflect the federal government’s understanding of its fishing territory in practice.

Such a defined outer boundary was simply not needed for the majority of twentieth century, reflecting the inshore nature of the fishery and available technology. The frequently used “Cape Islander,” which dates from approximately 1905, was constructed entirely out of wood until the 1970s. Originally averaging about six metres in length, they grew to average 15 metres by the end of the 20<sup>th</sup> century (Walker and Barret 1990). Early boats were totally open, then evolved to have a semi-enclosed wheelhouse. The hydraulic trap hauler was not introduced until the early 1960s, making hauling heavy traps out of the water easier for fishers, though improvised haulers using parts from automobile engines were used much earlier (Southwest Harbor Public Library n.d.; Canadian Museum of History, n.d.).

Fishing boats’ engines were also small. Single cylinder, two-cycle “make and break” engines were valued for their dependability and reparability, and these simple gasoline engines were made in the Maritimes, for example, by Acadia Gas Limited in Bridgewater, Nova Scotia (Memorial University 2021; Staff 1992). Such engines were neither powerful nor fuel efficient, but their continued popularity well into the twentieth century showed that these engines served

fishers' needs within the highly inshore nature of the fishery. Boats did not need to travel far because one did not need to travel far from shore to catch Lobster. This was one of the reasons Lobster fishing was so widespread. Lobster prefer to live in habitats that provide shelter, nestling in areas around boulders, cobble, or constructing their own burrows in mud (McKee et al 2021). The craggy inland shores of eastern Nova Scotia and muddy flats of the Bay of Fundy make for excellent Lobster habitat.

Between cost, safety, and technological capacity, then, Lobster fishers had few reasons to venture far off the coast until much later in the twentieth century. The outer boundaries of the maps broadly overrepresent the outer boundary of most fishing experience during this time, unless the regulations specified a five-mile limit, which the maps do represent.

## **VARIABILITY IN GEOGRAPHICAL BOUNDARIES**

Another notable feature of the maps is the frequency of changes in boundaries. When the researchers initially decided to create these maps, it was assumed that there would have been an overall consistency within fishing boundaries, and that only a few maps would need to be created. Instead, it quickly became clear that the regulations told a much different story.

Sometimes changes were quite minor. For example, in 1934, the district line between districts 3 and 4, which divided the interior Bay of Fundy fishing regions from the South Shore of Nova Scotia, was set within Digby County at Burn's Point. In 1940, this changed to Point Prim, a location less than fifteen kilometres away. In 1947, an amendment reflected a change back to Burns Point as the marker line, which has continued to be the marker until the present time.

In other cases, the changes were more dramatic. In 1914 (figure 8), the entire coast of Cape Breton, save a small portion in the southeastern region, was combined into one district. This went against the grain of the regulations more generally, as the districts divisions were usually set somewhere at the entrance to the Gulf of St. Lawrence close to the northernmost tip of the island. This division reflected the fishery as it was in practice, where the Gulf fishery often followed different trends than those on the eastern shore of Nova Scotia, particularly because of the ties in that region to the canning industry that maintained its importance later into the twentieth century than it did on the eastern side of Nova Scotia and in the Bay of Fundy (Morton 2019; DFO 2012). The change was reversed again in 1918, when the division line was set at Cape North and later Cape St. Lawrence. Then again in 1949 (figure 9), the boundary was set to Broad Cove Chapel, an area substantially further south near the town of Inverness, then in 1954 (figure 10), shifted slightly south to Sight point. In 1957 (figure 11) it was set back to Delaney's Beach, then finally settled slightly north at High Capes in 1963 (figure 5). This is where it has remained ever since.



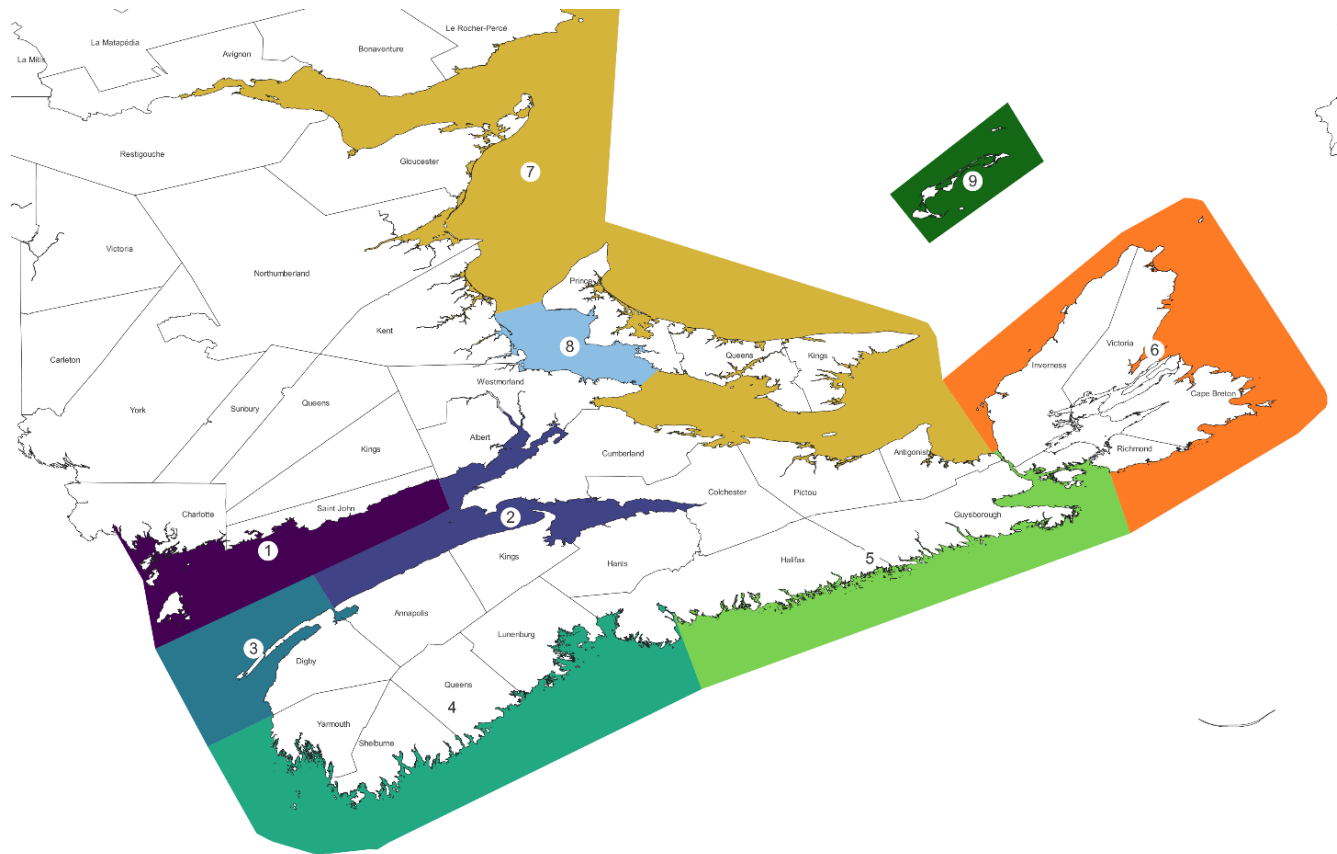


Figure 8: 1914 Lobster fishing district boundaries

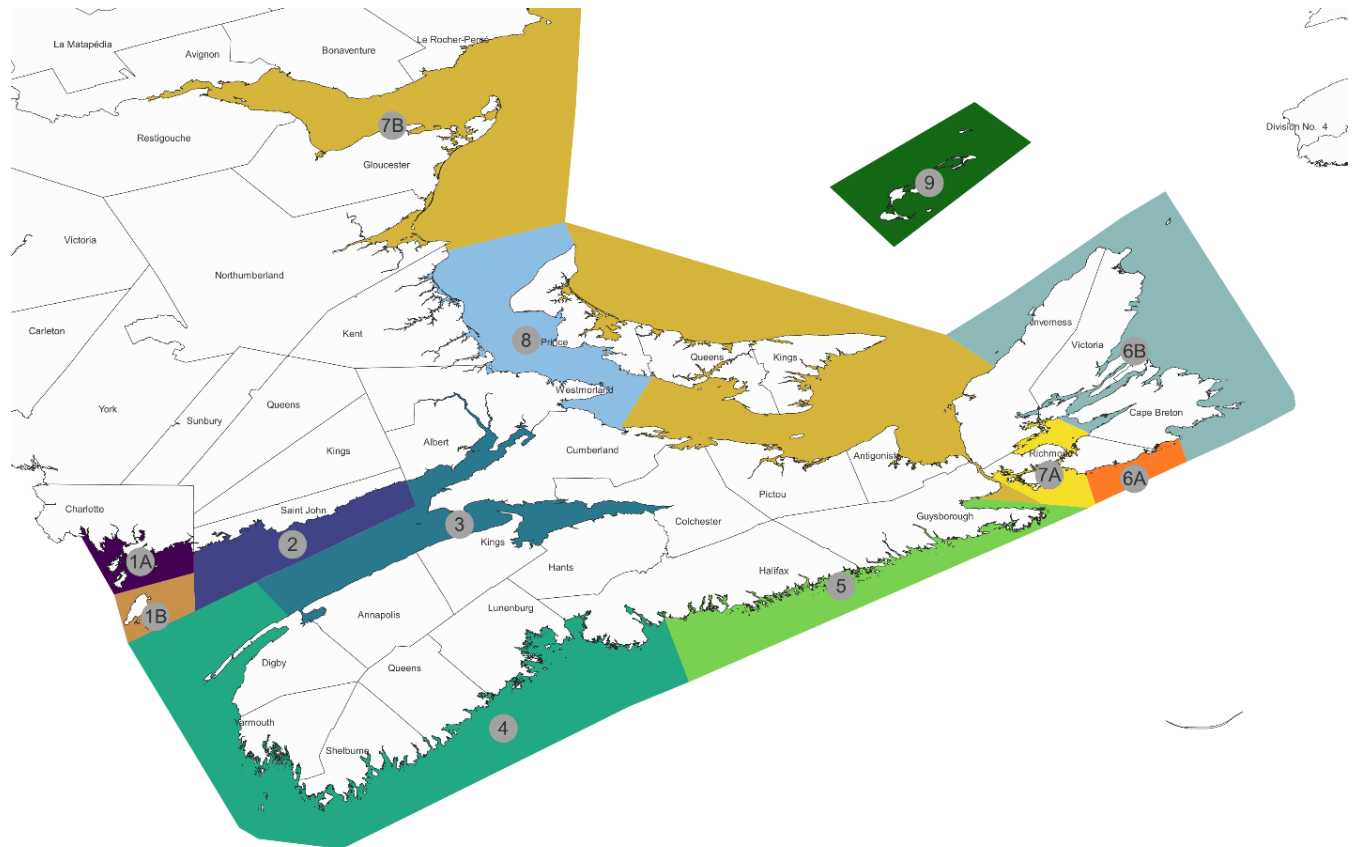


Figure 9: 1949 Lobster fishing district boundaries. The 1a/b division here does not represent a seasonal change but rather differences in MLS between Charlotte County and Grand Manan.

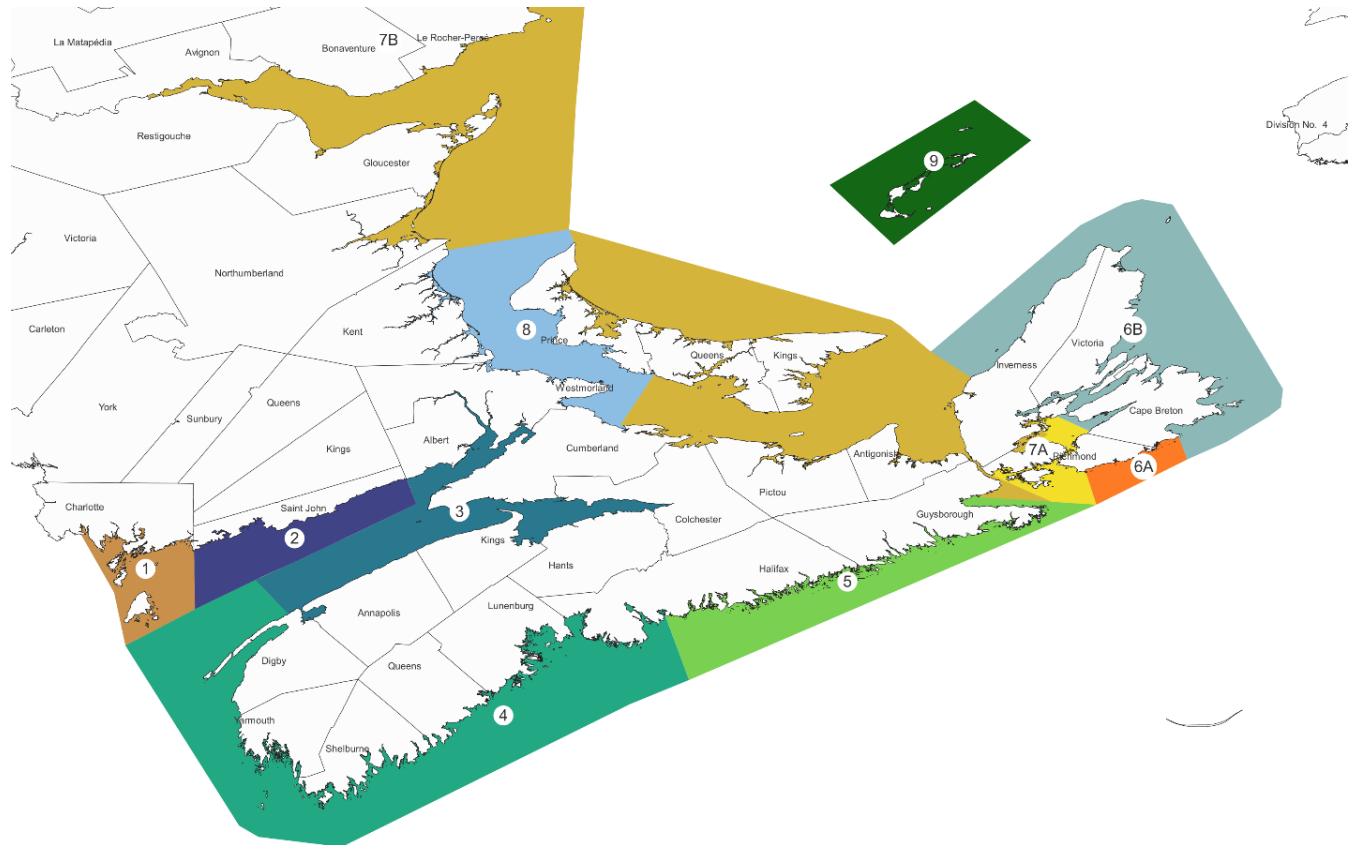


Figure 10: 1954 Lobster fishing district boundaries. In this map (and in subsequent years) the lagoons of the Magdalen Islands were closed to fishing. Given the scale of the map, it is difficult to represent this. Also, the coastal area around River Philip and Bergman's Point is not rendered in fine detail on the base layer of the map. In order to determine the boundary, we used longitude and latitude coordinates defined in the regulations and then were able to determine the GPS coordinates based on that, then applied that retroactively to earlier maps that used this same geographical division.

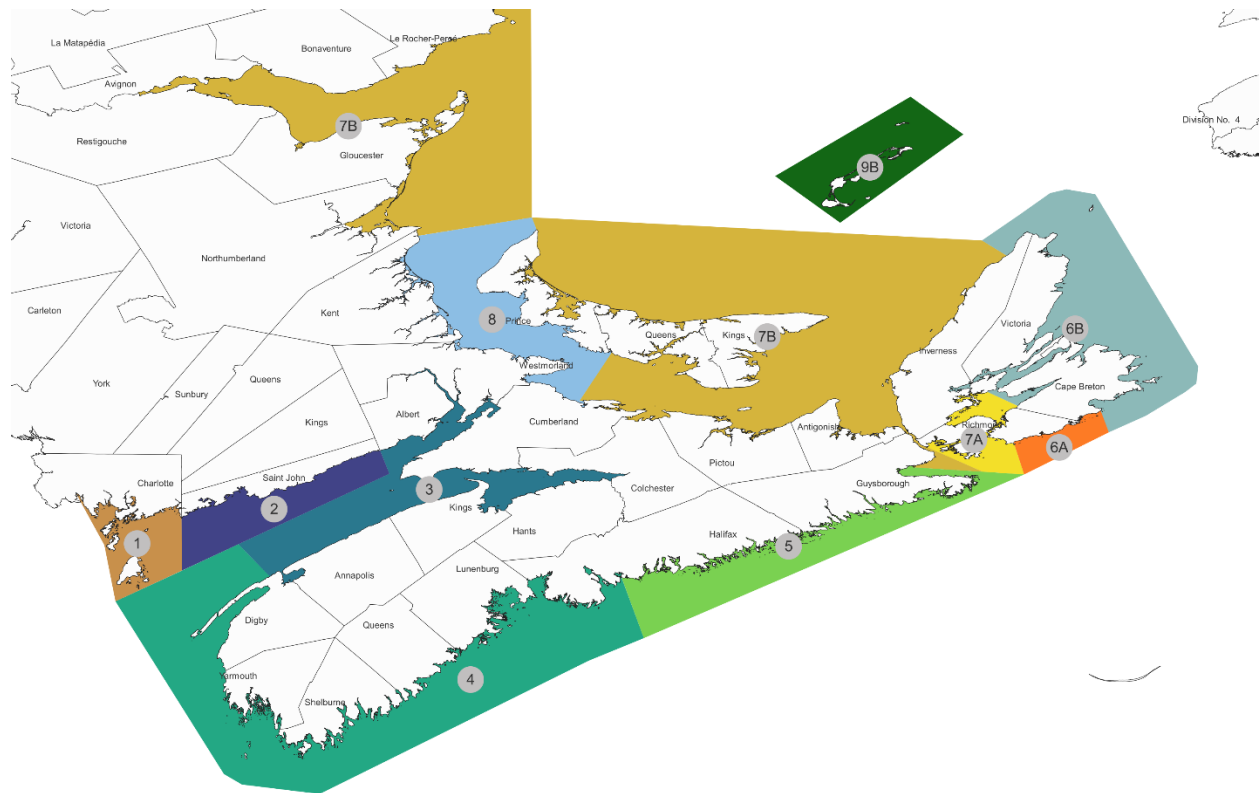


Figure 11: 1957 Lobster fishing district boundaries

At times the reason for such changes are clear within amendments. In 1925 amendments state that based on a request from fishers in the Magdalen Islands, the government would push the start of the season forward from May 1 to May 10, as weather conditions were poor and that limiting the season would prevent “the more adventurous fishermen engaging in such Lobster fishing.” (LFR 1925) This reflected a health and safety concern as well, and an understanding that by properly defining fishing seasons, the department (then the Department of Marine and Fisheries) could help to fulfill health and safety objectives both for the department and for fishing communities.

Additionally, the changes depicted in these maps do not reflect all the changes made throughout the twentieth century, as they only depict the Lobster Fishery Regulations at times when they had been repealed and replaced. Though the researchers created thirteen maps, these do not depict interim changes created through amendments, which were also frequent in the intervening years. Occasionally, amendments could be used to change other parts of the regulations, such as MLS. For example, in 1903, an amendment was used to create a new district for Charlotte County in New Brunswick, creating a new minimum legal size of 10.5” total length for the Bay of Fundy and removing minimum legal sizes for the rest of the districts (LSR 1930). As seen in the above example, in 1925 changes were made through amendments that altered the season length without changing geographical boundaries. Typically, though, the search of regulations indicate that major, wide-ranging changes to minimum legal size and seasons accompanied the repeal and replacement of the regulations.

The frequency of changes to the geography of Lobster districts demonstrates the variable nature of territoriality in the fishing industry, and potentially, the rejection of top-down decisions by fishers if the districts did not represent the true nature of the fishery on the ground. It also demonstrates the highly localized nature of fishing and the multiple factors and pressures involved in setting boundaries, which included market pressures, weather, and *de facto* rules within local communities.<sup>14</sup> How much was driven from above, by government regulators, and how much was driven from below, by fishermen, is not clear simply by tracking these changes, and the specific reasoning behind such changes will remain mysterious without further research into the local context during times they were made.

## CHANGES IN MINIMUM LEGAL SIZE

Regulating catch size and setting a minimum legal size has been closely associated with Lobster fishing districts since their inception. In the late nineteenth century, there was a conflict between the federal government's intent to protect smaller Lobsters for conservation purposes, and the canning industry, which needed a huge supply of product for their industry. The 1899 Lobster Commission noted that "strict enforcement of the present law [set at 10 ½ inches] would practically close the canning industry..." (Prince 1899, 62). This comment demonstrates both the impracticality of enforcing regulations that did not respond to the local market demand, and also the lack of operational enforcement during that era. As the maps reflect, for some time the government had minimum legal sizes in some areas but not others.

Initially sizes were provided in total length in inches. Early in the twentieth century, some districts began to use carapace (body shell length) rather than total length as the measurement standard. However, some districts continued to use total length. In order to provide a consistent measure of size regulation over time, the researchers used a recommended conversion ratio (Wilder, 1967). This conversion factor suggests using a 2.9 ratio for both Lobster sexes to convert Total Length (TL) to Carapace Length (CL). We used this equation to convert TL to CL (see respective maps in Appendix I):

$$CL = TL/2.9$$

During the first few decades of the twentieth century, the market progressed away from cannery-based products and toward the more lucrative live sales, due to the improvement of technology such as refrigeration. This increased the incentive for fishers involved in the live market trade to improve conservation measures to grow larger Lobsters (Morton 2019, 241). As a result, the distinction between districts with smaller MLS and districts with larger MLS may provide insight into their respective ties to the canneries or live market trade over time. It also allows observers to understand the practicality of the enforcement of such regulations within individual districts. Where regulations were not provided in the early part of the twentieth century, it was clearly not deemed practicable to enforce such regulations. As mentioned earlier, even where MLS regulations were in place, enforcing such regulations was a major difficulty for the government.

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<sup>14</sup> For more on how *de facto* regulations helped to define fishing territory, see Wagner and Davis 2004.

## DISCUSSION: CONSISTENCY AND PATH DEPENDENCE

The use of geographical descriptions for Lobster districts continued until the introduction of the combined Atlantic Fishery Regulations in 1985, when the newly entitled “Lobster Fishing Areas” were defined through maps and longitude and latitude coordinates. The use of longitude and latitude coordinates grew slowly and unevenly throughout the regulations.<sup>15</sup> Though the maps demonstrate a high degree of variability for the specific geographical areas, once the idea of the Lobster fishing district evolved, it remained stable as a regulatory tool. Though internally there were frequent changes to geographical boundaries, seasons, and minimum legal size, and naming, the overall structure of the District and associated regulations remained permanent from 1899 to the present day.<sup>16</sup>

The Lobster fishing district may be an example of what some social scientists have referred to as “path dependence.” Scholars have described path dependence as the dynamics of positive feedback processes within a system. Put simply, it is the idea that once a particular path gets established, it is difficult for reversals to be made in that system as processes become entrenched (Pierson 2004). As Lobster fishing districts, which combined government management areas with fishing territory and seasonality, became established and evolved over the twentieth century, the overall framework of districts remained static. Most major changes to the geography and seasonality of districts occurred in the first fifty years. Between the 1950s and 1985 (figures 5, 9-13), with the development of Lobster Fishing Areas, fishing districts were relatively stable geographically.

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<sup>15</sup> In 1949 some of the districts include longitude and latitude coordinates to divide Lobster districts, though these may have been introduced earlier through amendments. The regulations also introduce a greater degree of specificity within some districts by specifying markers placed by fishery officers as marking points.

<sup>16</sup> Minimum legal sizes showed a high degree of variability, and for many years there were no minimum legal sizes at all. By 1940 minimum legal sizes had been established for all districts in the Maritimes.

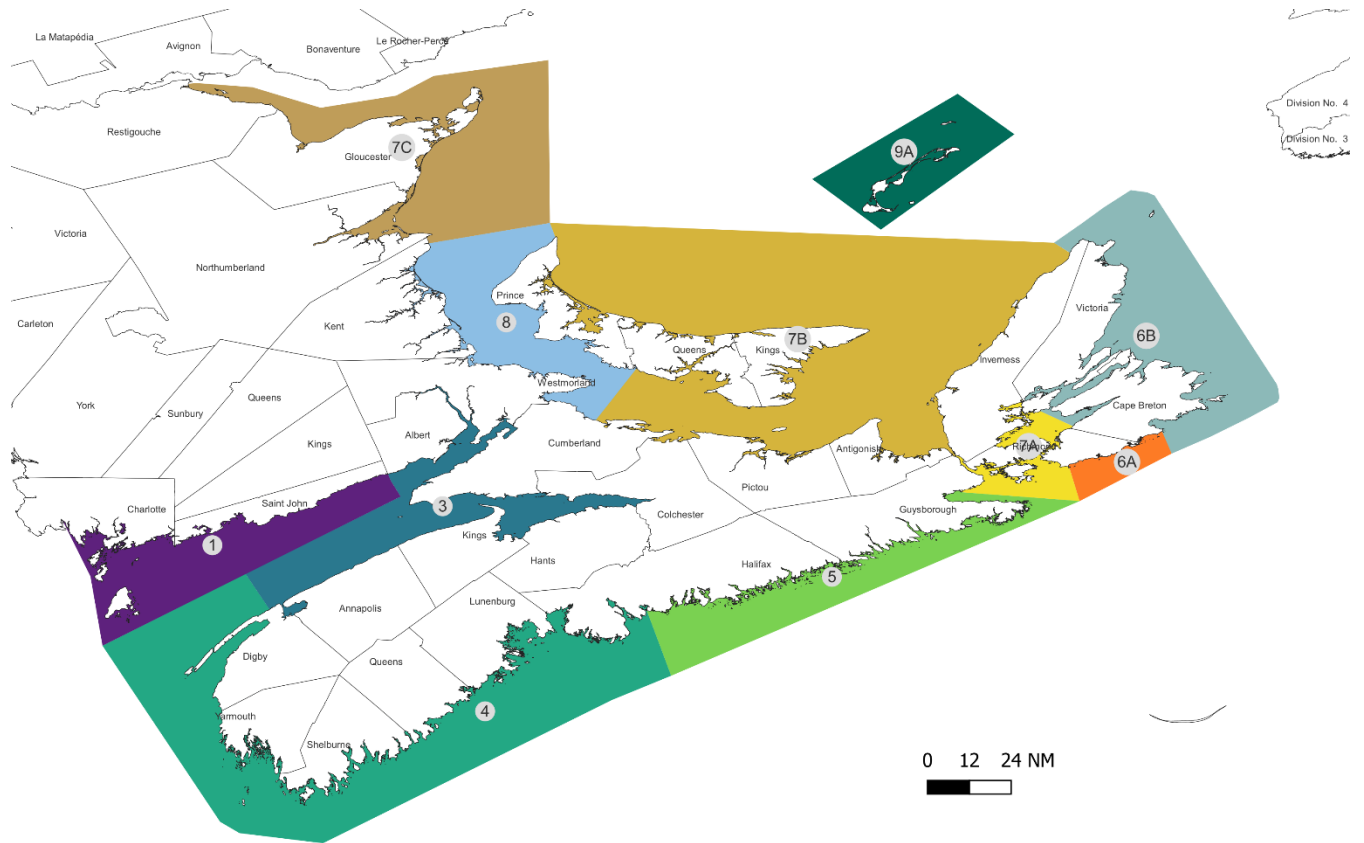


Figure 12: 1974 Lobster fishing district boundaries

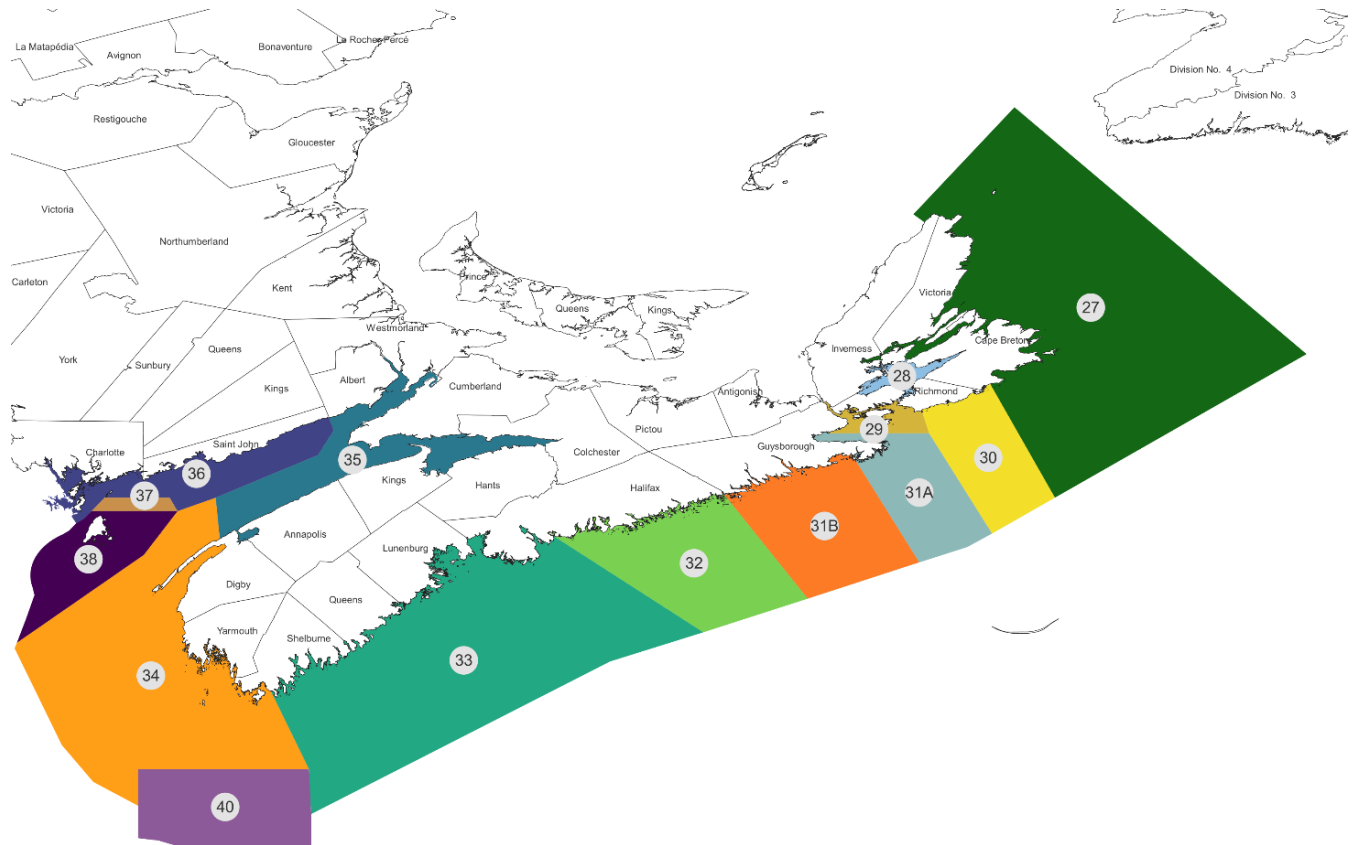


Figure 13: 1985 to present day Lobster Fishing Areas (LFAs). LFA 40 is a closed area that was established in 1979 and is designed to protect Lobster brood stock.

This period also saw the Canadian government dramatically increase its control over the fishery, both through increased enforcement of existing regulations and through the introduction of new ones. The government began to use licensing as a tool to encourage professionalization among Lobster fishers, reflecting contemporary governing modernization paradigms that encouraged efficiency (for example, see Wright 2001). As the government increased its involvement in regulating the fishery, it did so based on the structure of Lobster fishing districts that had already been established. For example, as there is only one species of American Lobster throughout the region (*Homarus americanus*) stock assessments and the provision of science advice are based on LFAs. The increased number of LFAs as of 1985 also speaks to the ability of the government to regulate at a finer scale than in years past.

It is useful to compare this experience with that of Maine. Presently in Maine, though the majority of Lobster fishing takes place during the summer and fall months, there are no seasonal limits for fishing and Lobster fishers can and do fish legally year-round. This was not always the case, however. In the late nineteenth century, overfishing had led to the near collapse of the Lobster stock on the Maine coast. As a result, in the 1870s the Maine legislature introduced a closed season in the fall, limited the cannery season, and introduced conservation measures designed to protect egg-bearing females. Cannery operations found operating within these limits unprofitable, partly owing to increased competition from Canada, and canning operations largely



closed by 1895 within Maine (Losonci et al n.d.; Cobb 1899). By the time of the 1898 Lobster Commission, then, Canadian officials had much to be concerned about, given Maine's experience. Many of the early conservation policies that Canada introduced in the late nineteenth century, such as protecting berried females, directly modeled the American experience. In the case of Lobster districts, however, Canadian regulators chose to make the seasonality of Lobster fishing central to their regulatory and conservation practices in a way that never became embedded in the American experience, where year-round fishing returned by the early twentieth century (Cobb 1899). Once this direction had been taken, the regulatory path became entrenched, and has continued until the present day, as is quite apparent by the series of maps developed by the BELT.

Modern-day LFAs are the basis for regulating the Lobster fishery. As the twentieth century progressed, these fishing areas became more and more "real," and fishers were increasingly brought into the regulatory systems that oversaw the Lobster fishery, and regulations were increasingly enforced. This is apparent not only by the slowing in changes by mid-century, but also by the fixedness of the 1985 LFAs, which have remained nearly static since their creation. Area boundaries have also served to reinforce local values, such as the principle of adjacency which gives fishers priority access to their own local harbours (Wiber and Barnett 2021).<sup>17</sup> Observing how the districts change over time is one way to examine the relationship between the regulating body (the government) and those using the space (the fishers).

## CONCLUSION

This report has provided an overview of the purpose and methods within the discipline of history. It has also described how historical data and methods and methodologies have been used to support fisheries research. History as a discipline has also absorbed some of the techniques and methods found within the natural and social sciences, particularly through the use of innovative software and systems, such as GIS. The BELT has consciously applied the use of history and historical methods and methodologies in informing its work, which has attempted to blend the natural and social sciences with the aim of informing Science Advice. Part of this work has included a project that created maps tracking changes in Lobster fishing districts from 1899 to 1985. These maps will not only provide DFO employees and other researchers with a comprehensive look at the changes in districts over the twentieth century, it will also help to determine how quantitative historical data can be represented over time. It also helps to inform an overall understanding of the history of Lobster regulations in the Maritimes.

Specifically, the maps help to visualize several themes within the fishery, including changes in the geographical importance of the fishery over time, the intensely inshore nature of the Lobster fishery for the majority of the twentieth century, the variability in the boundaries of Lobster districts over time, and the broad transition from a cannery-based market to a live Lobster market. The maps taken as a whole help to demonstrate consistency of the regulatory approach to Lobster over the twentieth century. However, there are limitations to the interpretive capacity of these maps, as more work would need to be done to investigate the specific reasoning behind the changes.

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<sup>17</sup> Though typically it is the case that fishers are licensed to fish in their local harbours, it is not necessary. Currently, the regulations allow for a qualified applicant to receive a licence for any area within the DFO Maritimes Region as long as they are a resident of the Region.

This effort has also confirmed the value of trans- or multi-disciplinary approaches within the context of fisheries research. The ability to find data using historical methods, and the ability to apply that data through analysis (e.g. statistics) may be skills held by the same person; however, this is not always the case. Moreover, the division of labour and labour specializations are basic principles of heightened efficiency, so team-based methods of research, composed of individuals from varying disciplines, can be more effective in inquiries of this kind. The maps produced in this report required this type of collaboration between the humanities and the natural sciences.

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**APPENDIX I – LOBSTER FISHING DISTRICT BOUNDARIES WITH SEASON AND MINIMUM LEGAL SIZE (MLS) INFORMATION, 1899-2023**

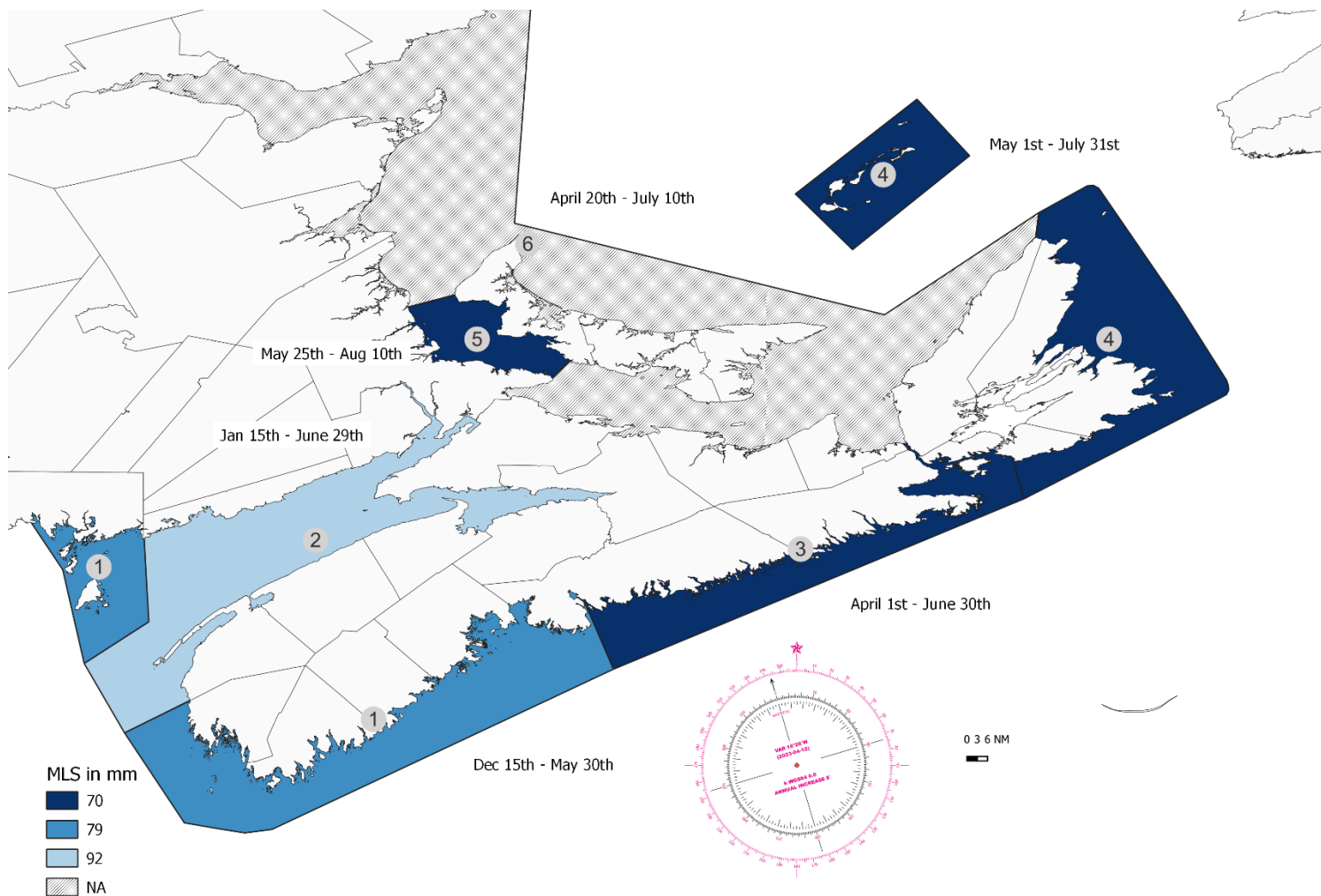


Figure 14: 1899 Minimum Legal Sizes. The regulations specify that the boundary on the north side of the Canso Strait is to a “line passing from Flat Point in Inverness County, to the lighthouse in Antigonish County opposite.” However, no Flat Point or lighthouse was identifiable in that area. However, there is a “Low Point” in Cape Breton across from what was at one time the North Canso Lighthouse. The 1911 report on the List of Lights and Fog Signals showed the North Canso lighthouse at longitude and latitude points across from Low Point. Given this contextual information, the researchers are comfortable that this is the correct boundary point (Lighthousefriends.com 2023; Department of Marine and Fisheries 1911).

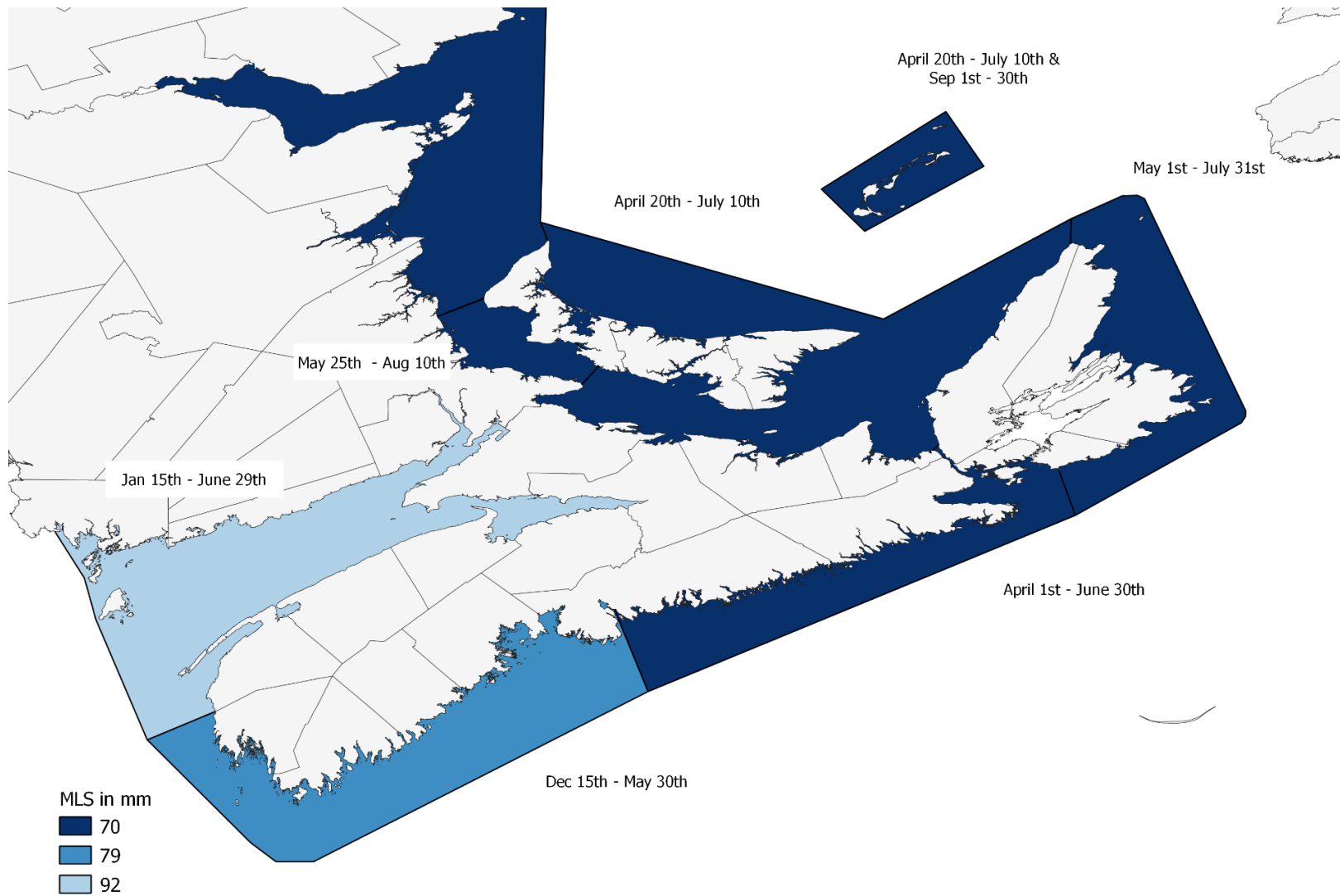


Figure 15: 1907 Minimum Legal Sizes

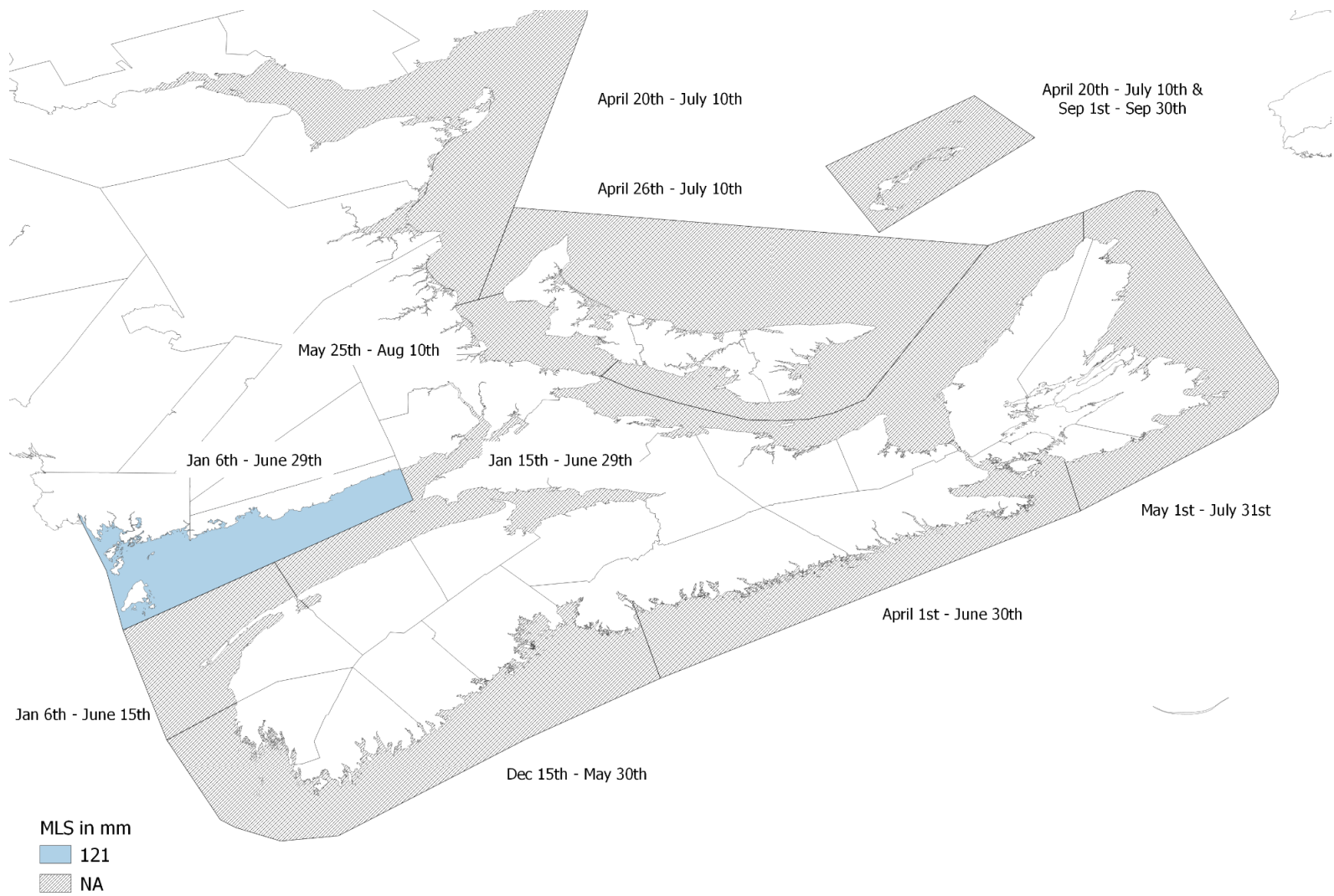


Figure 16: 1910 Minimum Legal Sizes

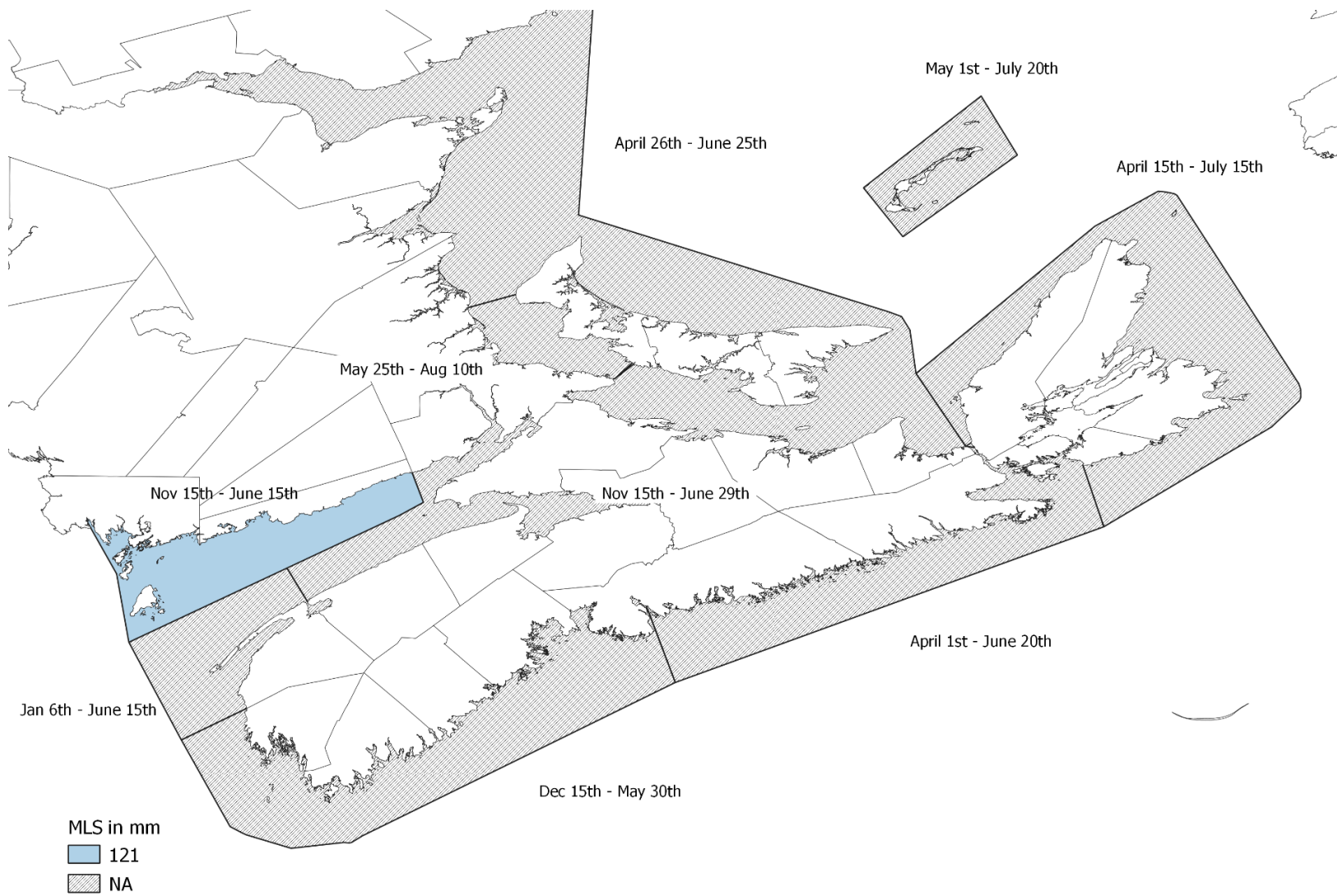


Figure 17: 1914 Minimum Legal Sizes



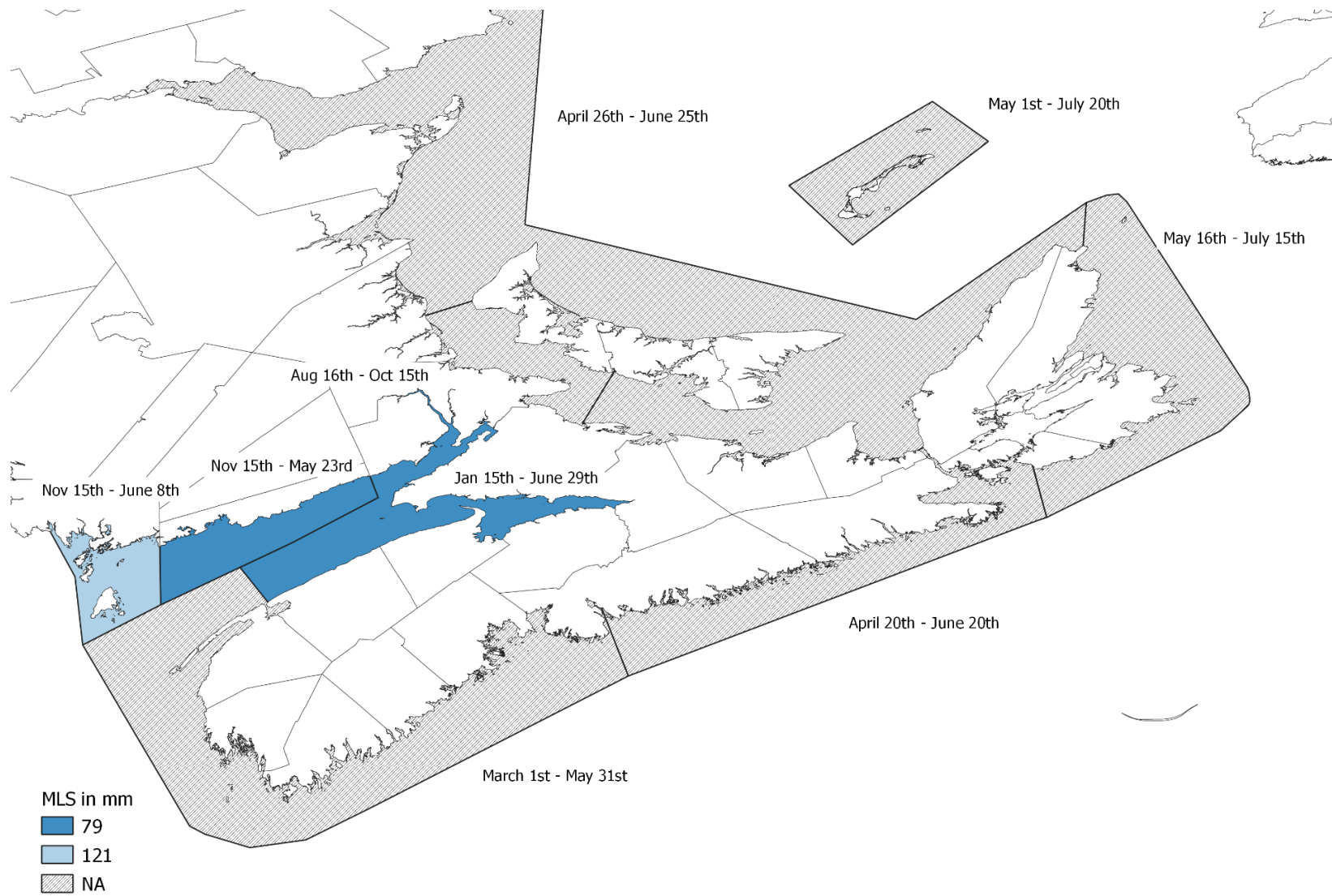


Figure 18: 1918 Minimum Legal Sizes

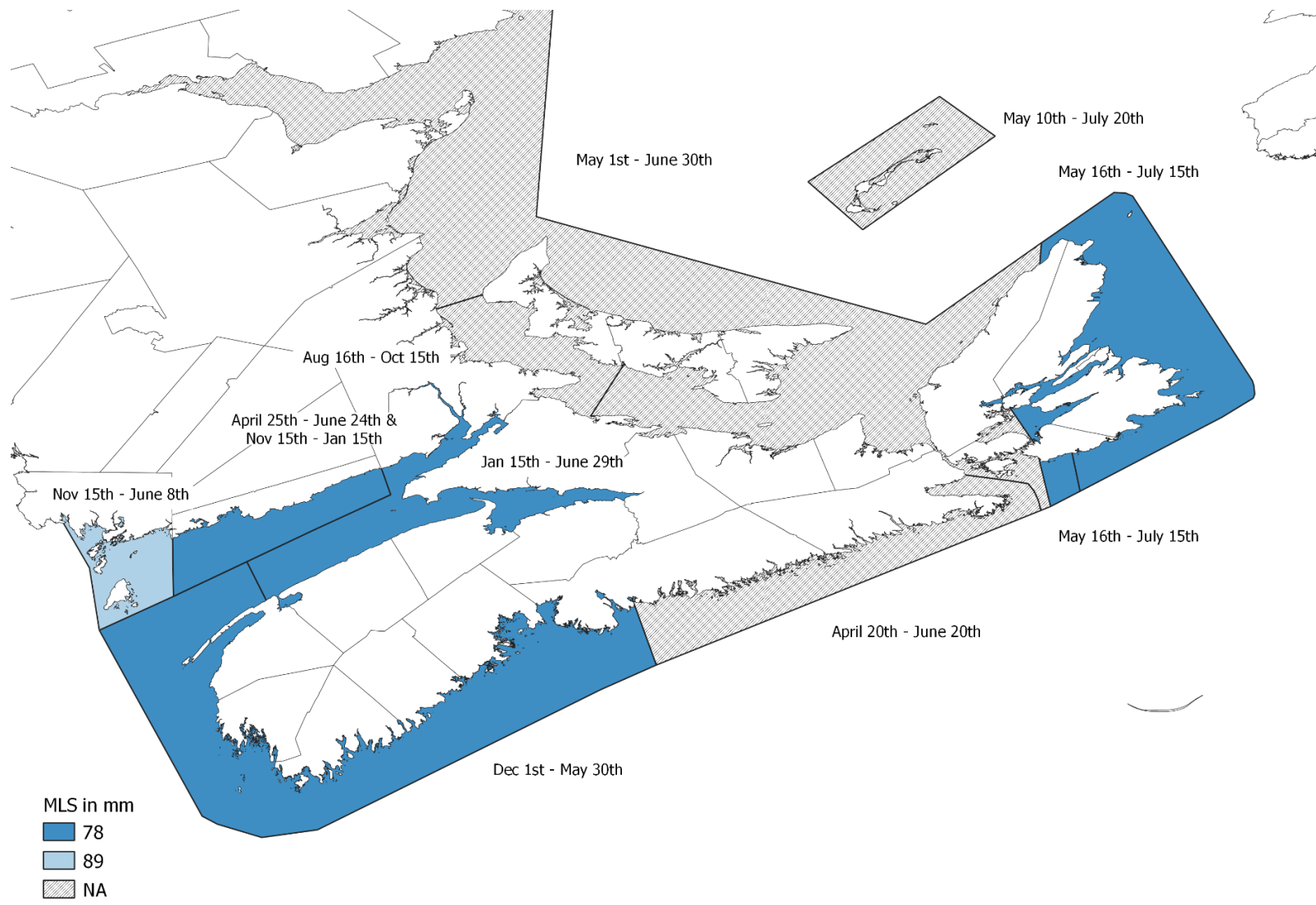


Figure 19: 1934 Minimum Legal Sizes

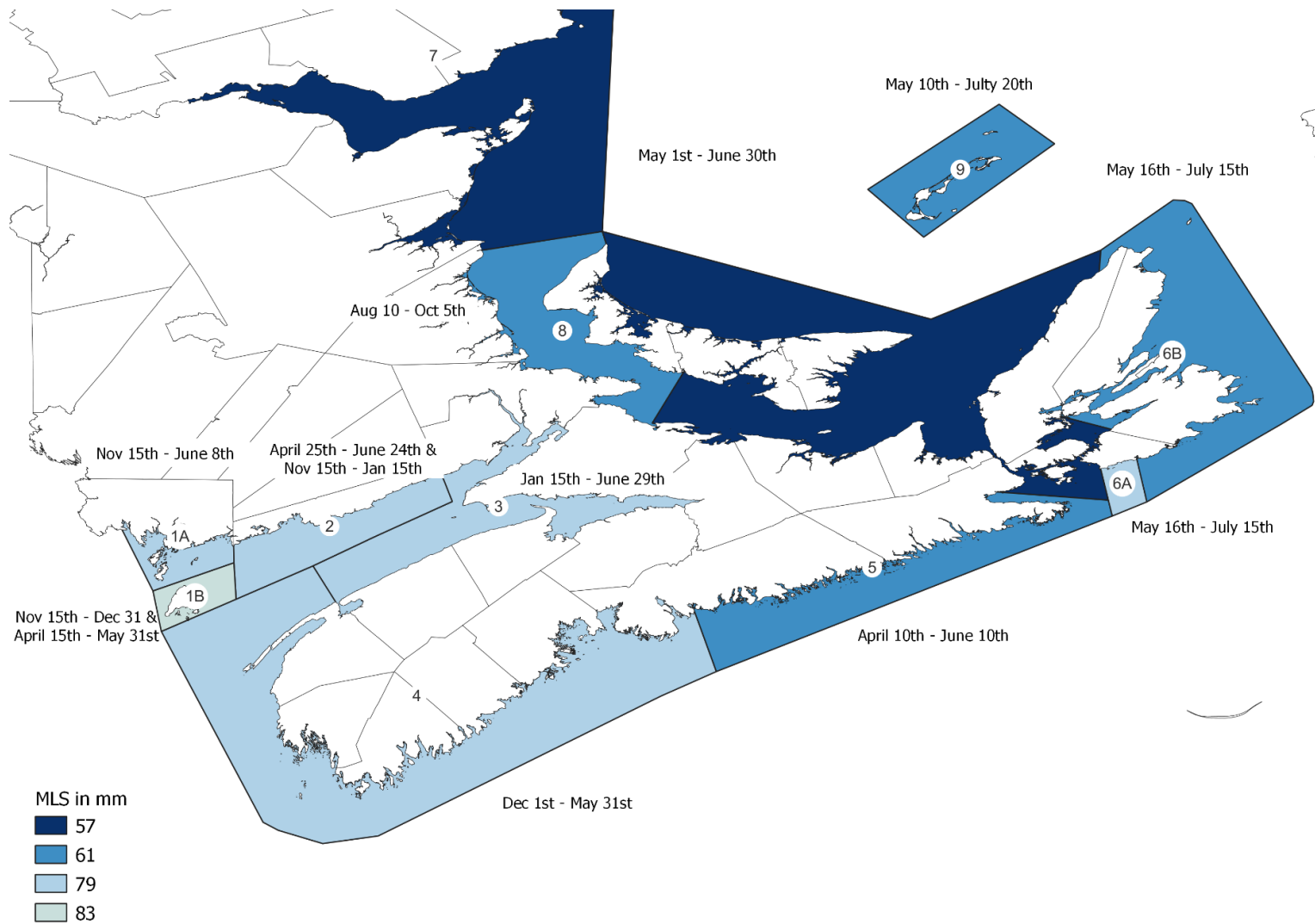


Figure 20: 1940 Minimum Legal Sizes



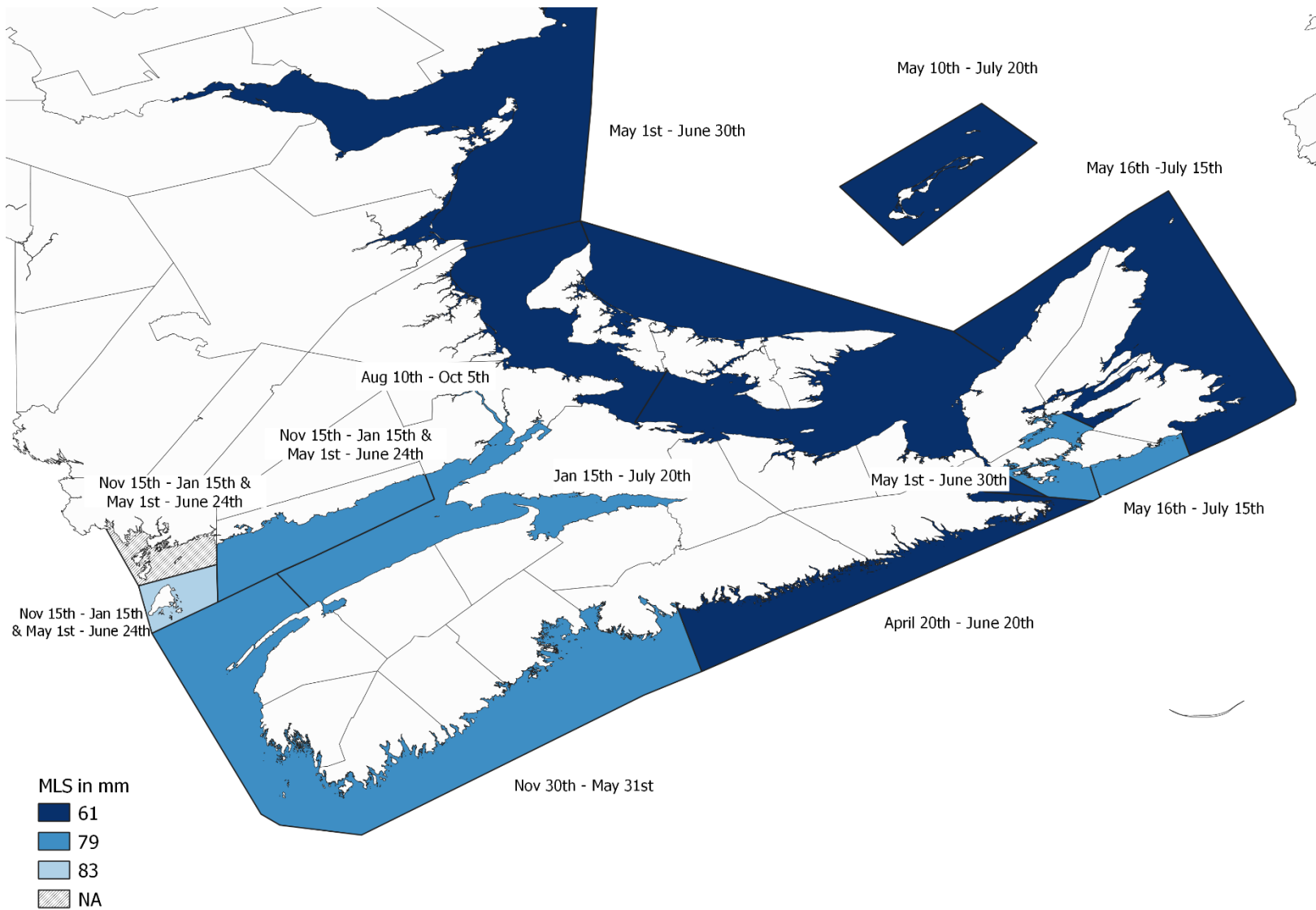


Figure 21: 1949 Minimum Legal Sizes

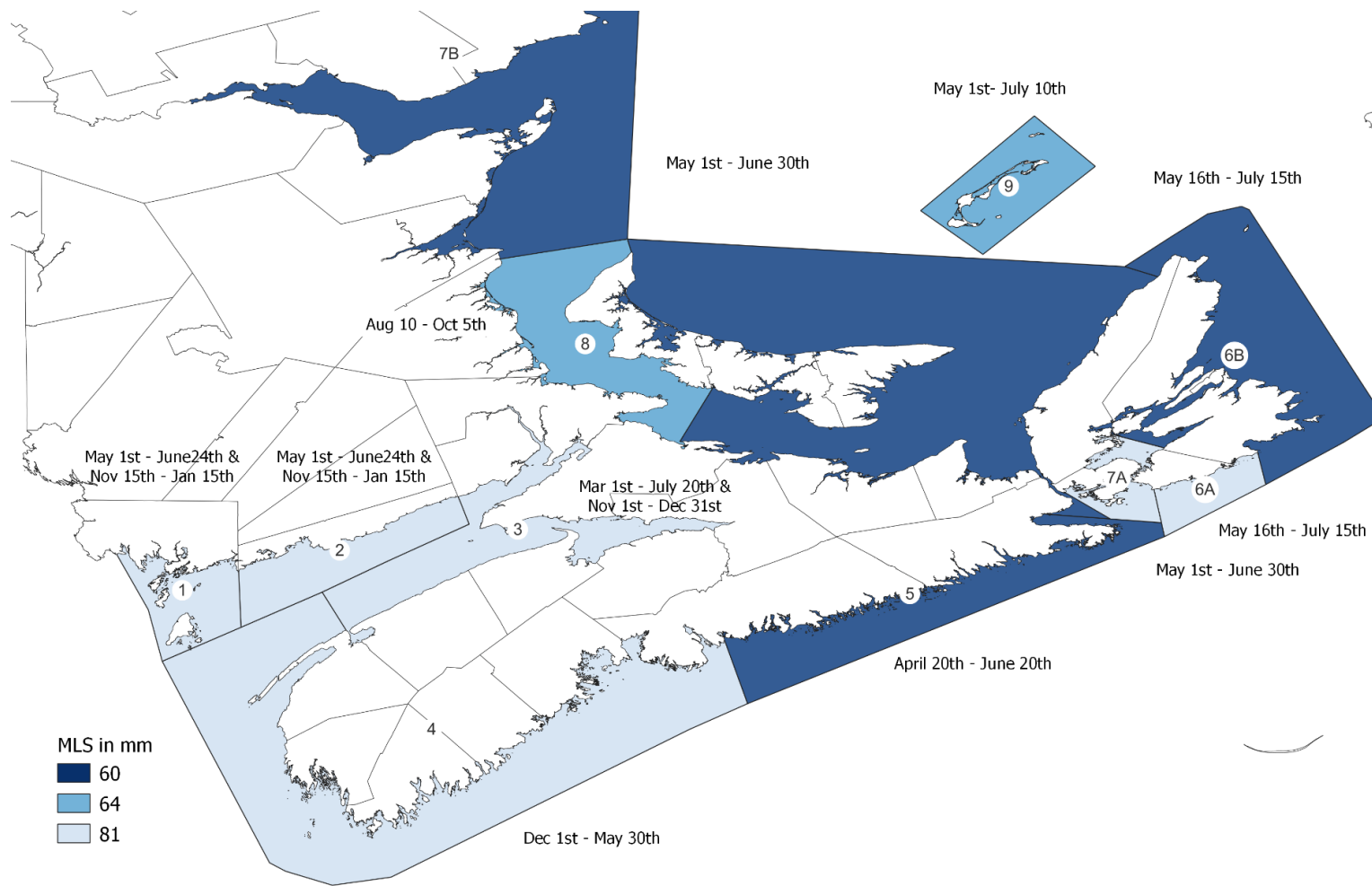


Figure 22: 1954 Minimum Legal Sizes

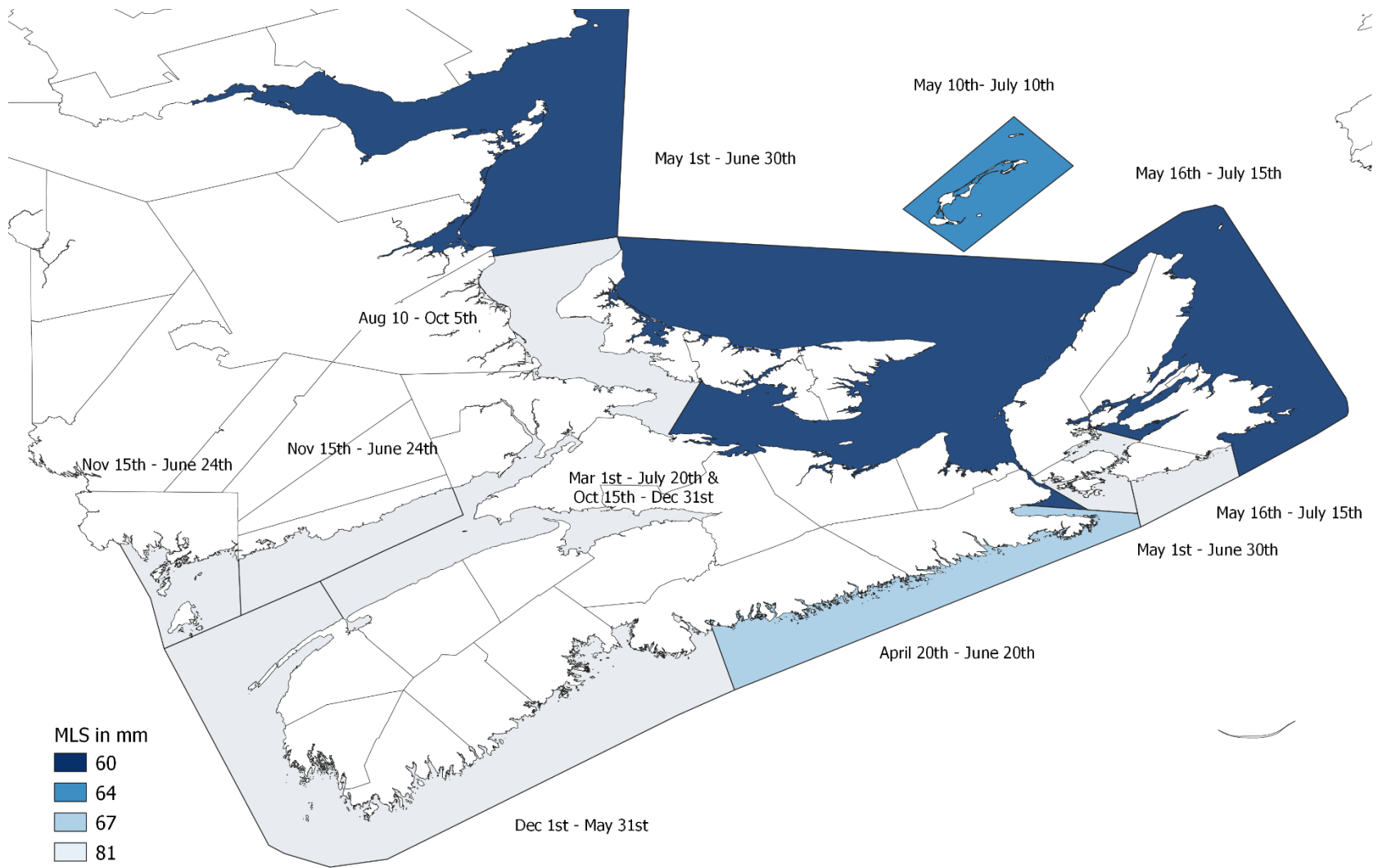


Figure 23: 1957 Minimum Legal Sizes

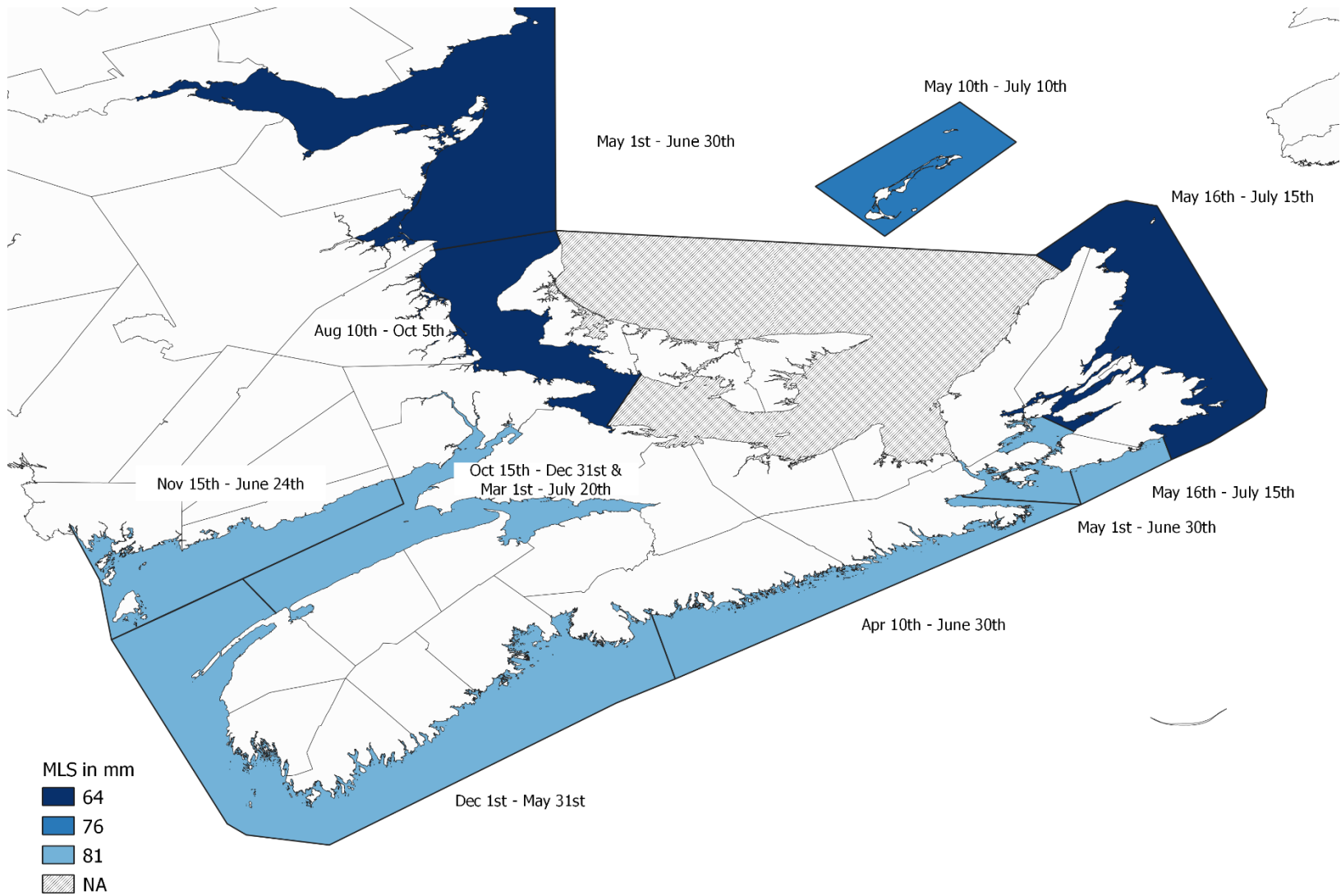


Figure 24: 1963 Minimum Legal Sizes

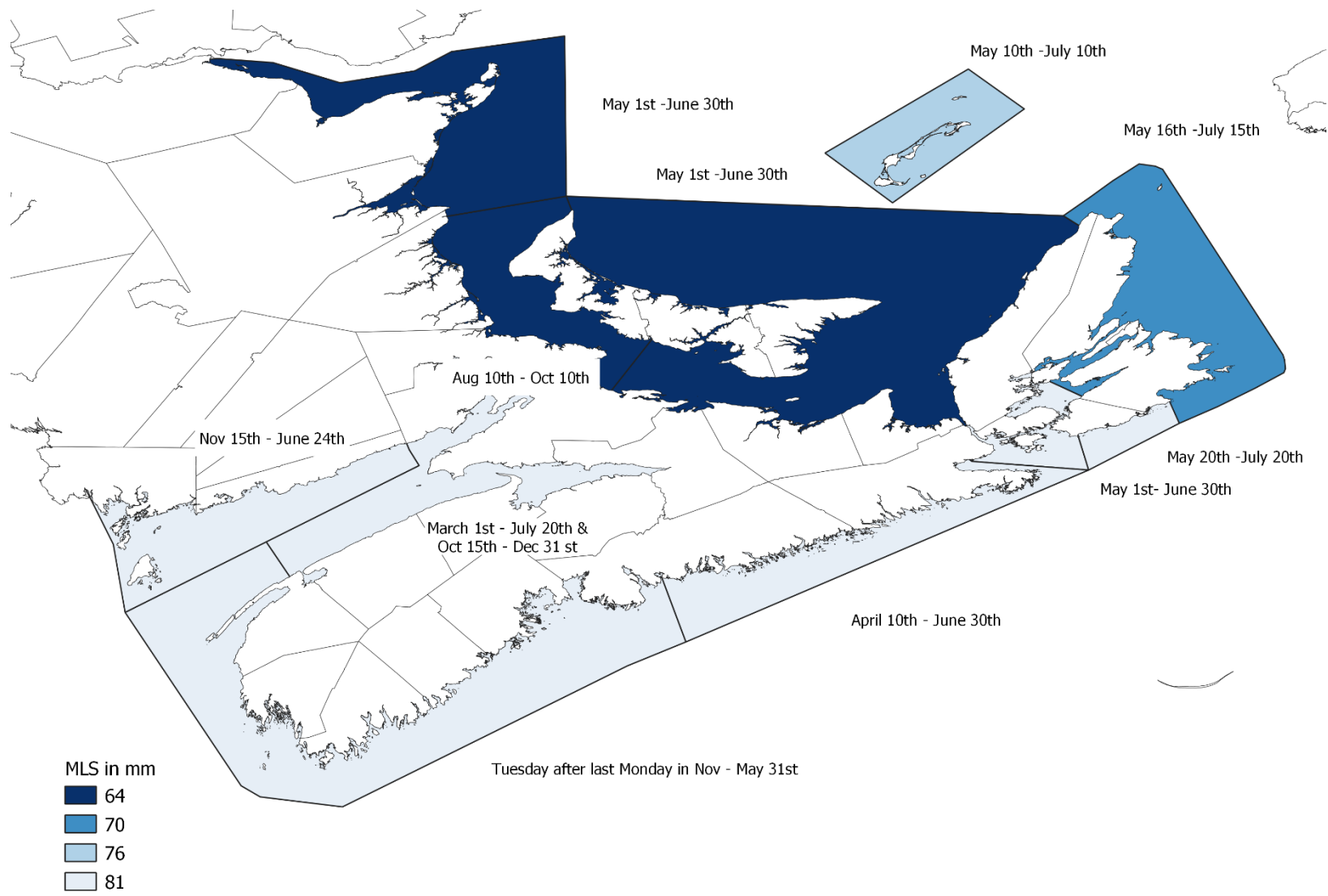


Figure 25: 1974 Minimum Legal Sizes; The lagoons of the Magdalen Islands closed year round.

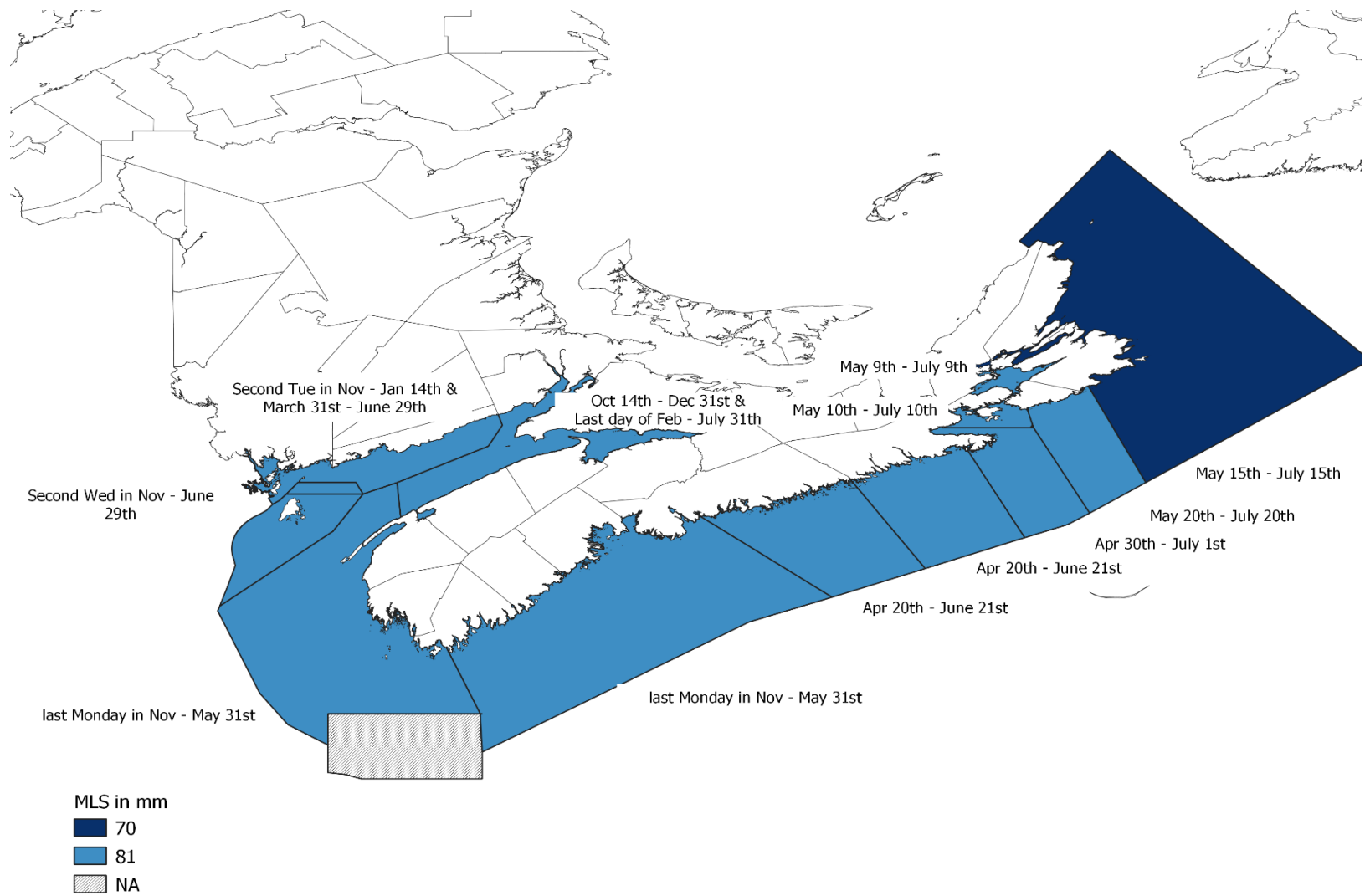


Figure 26: 1985 Minimum Legal Sizes

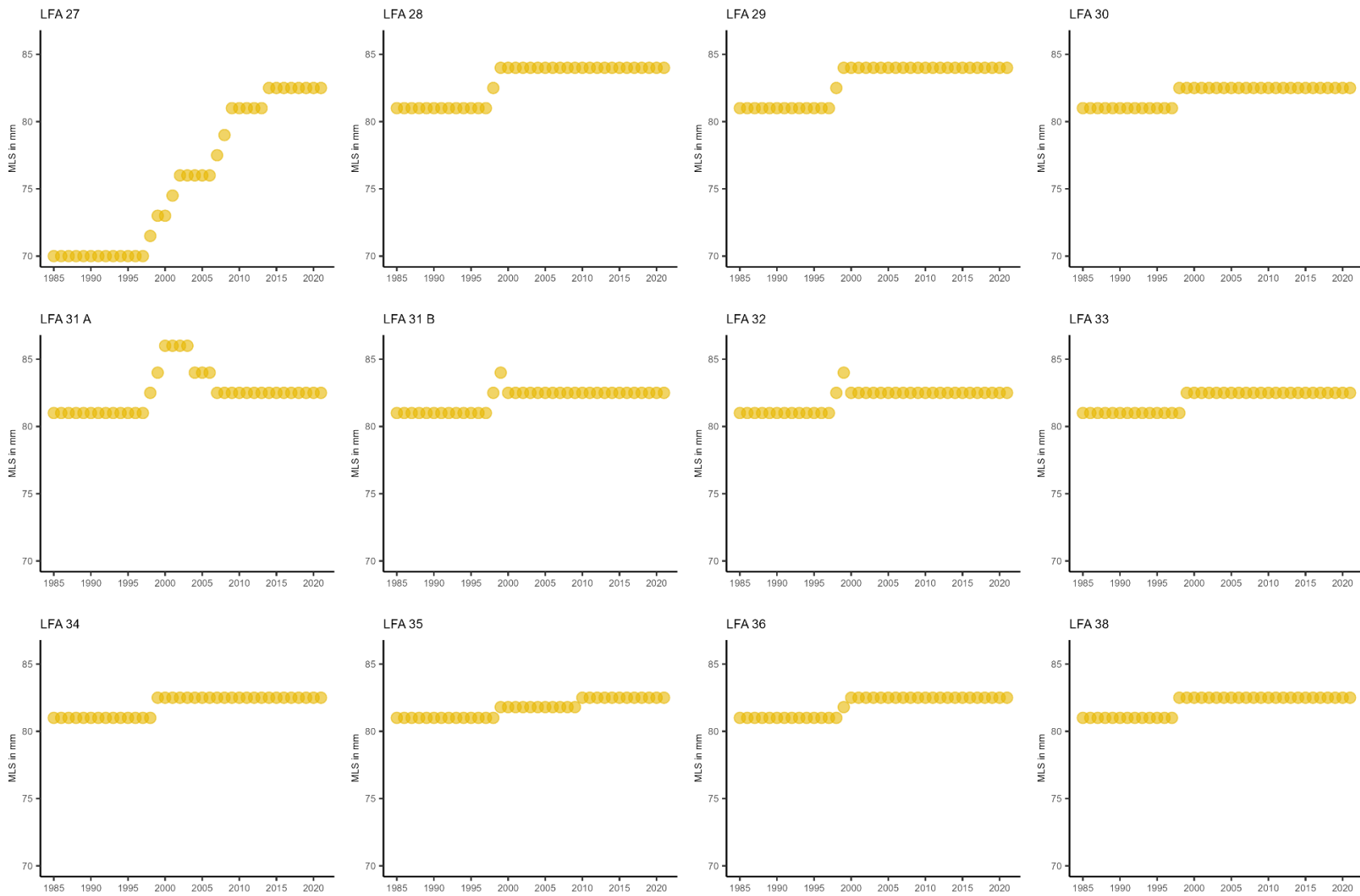


Figure 27: Minimum Legal Size Trends Since 1985 by Lobster Fishing Area