THE NEWFOUNDLAND AND LABRADOR SEA URCHIN FISHERY: POPULAR KNOWLEDGE, IDENTITY AND OCCUPATIONAL ATTITUDES WITHIN THE NEW FISHERY

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THE NEWFOUNDLAND AND LABRADOR SEA URCHIN FISHERY: POPULAR KNOWLEDGE, IDENTITY AND OCCUPATIONAL ATTITUDES WITHIN THE NEW FISHERY

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Abstract

It is the purpose of this study to analyze the unique nature of the sea urchin fishery in Newfoundland and Labrador. Through the theoretical lens of vernacular knowledge, the sea urchin fishery will be explored within the context of the province's larger fishing industry, following the collapse of ground fisheries of the early 1990s. The occupational folklife of a group of sea urchin fishers is explored, specifically the role their vernacular knowledge plays in their industry. Within the realm of this knowledge come the harvesters' work techniques, narratives and attitudes. This knowledge makes for an occupational folk group with a distinct sense of identity, autonomy and empowerment. The individuals highlighted in the case study here are shown as having tremendous potential for a co-management function within this fledgling fishery in Newfoundland and Labrador.

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developments was that these fishery workers were left with no ownership of an industry that had granted them a large amount of freedom and autonomy in their occupational lives.

It was with these images in mind that I began to look closely at the sea urchin fishery. As the species had not been fished commercially in Newfoundland and Labrador prior to the cod moratorium of 1992, I was interested in examining how mistakes of past management schemes might be considered, or if they would be considered at all in developing this new fishery. I also wanted to explore the dynamics of a specific group of sea urchin fishers in an effort to determine whether the skills they possess have a place in the management of such a fishery. I attempted to address several key questions upon commencing this study. What set this group apart from other groups? What unique body of knowledge did they possess that made them authorities on the sea urchin industry? How might these factors be incorporated into the new fishery of Newfoundland and Labrador? With these questions in mind, I set out to first explore the place of the sea urchin fishery in Newfoundland and Labrador within the context of the province's entire fishing industry.

The federal Department of Fisheries and Oceans (DFO) has deemed the sea urchin fishery as "experimental", meaning that fishers within the industry are permitted to do so only with an experimental license, as permanent licenses have yet to be granted (Newfoundland Sea). The small number of licenses granted severely limits the number of fishers involved in the fishery; therefore, those who

are involved have easy access to a large supply of sea urchins. The reason for this limited fishery is that its future feasibility is yet to be determined. These regulations make for a unique set of circumstances for those involved in the fishery. Small numbers of fishers and lack of monitoring of actual dive sites by fisheries authorities creates autonomy for those involved, which becomes evident when studying the occupational practices, traditions and attitudes of the fishers in the industry. Because little is known about the sea urchin fishery throughout Newfoundland, with the exception of those involved in the industry, fishers enjoy an elevated status within their communities that accompanies being the primary sources of knowledge within their industry. Those involved in other fisheries in the province do not hold this status as the practices and techniques of those fisheries have now become part of the everyday knowledge of many within the region who are not directly involved in the fishery. It will be illustrated here that it is the local knowledge, in addition to the group identity felt by sea urchin fishers, which allows for this status, as sea urchin fishers have accumulated a wealth of information concerning their environment, which affects their own existence in their communities (Dewalt 125).

In order to understand this unique circumstance, it is first important to recognize the effects of federal government regulations and interventions within the Newfoundland and Labrador cod fishery. Cries from fishermen for years prior to the initial cod moratorium of 1992 claimed that there were large problems with

cod stocks off the province's coast.[1] Nevertheless, DFO abided by the word of their own scientists and continuously set total allowable catches (TACs) that were too high to be supported by the resource, contributing to its collapse. The preference given to scientific rather than popular knowledge had a devastating effect on those who depended on the industry. These effects will be discussed in this study, in an effort to illustrate the potential positives of utilizing the current knowledge system of sea urchin fishers in the new fishery.

Scientific knowledge of the sea urchin fishery in Newfoundland and Labrador pales in comparison to popular knowledge. Conversations with and observations of sea urchin fishers show that they quickly become aware of their elevated status within their fishery, thus solidifying their identity as members of this group and creating a sense of empowerment within the group. More so than with other occupational fishing groups, it will be illustrated that sea urchin fishers share the knowledge that allows them to see themselves as self-educated, self-made, as well as self-employed men and women, as described by Lloyd and Mullen (77). The value of the knowledge of this unique group in sustaining the industry they rely on will be outlined.

The values of popular knowledge as well as issues pertaining to empowerment of the specific group involved are examined here. My research on this topic originated from my own involvement in the sea urchin fishery as a self-

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[1] Numerous studies have looked at these cries from fisherman. Such works include Craig T. Palmer's "A Decade of Uncertainty and Tenacity in Northwest Newfoundland," Cabot Martin's No Fish and Our Lives: Some Survival Notes for Newfoundland, and Michael Harris' Lament for an Ocean: The Collapse of the Atlantic Cod Fishery: A True Crime Story.

employed harvester. For the purposes of my research I followed the daily routines, observed the practices and discussed the techniques and attitudes of a group of five sea urchin divers as they went about their work for two fishing seasons. During this time I partook in the labours of the industry, actually harvesting sea urchins on occasion with my informants. Through my work I was able to avoid the problems that Robert McCarl voices which are often associated with documenting the folklife of an occupational group. He states in "Occupational Folklore" that much of what occurs in any given occupation is either covert, occurs too quickly to be measured or is impossible to document (75). The insider status I attained proved beneficial, as much of the work conducted in this fishery is done underwater, and out of sight to the average observer. Thus, I was able to document the corpus of occupational folklife of the sea urchin fisher. Occupational folklife is what McCarl describes as the combination of techniques, verbal expressions, and customs of work that comprise a wide-ranging way of life in the workplace (71). I have chosen to follow McCarl's definition closely in terms of my own documentation and analysis, as will be seen in Chapter 4.

1.2 The Issue

Newfoundland and Labrador's fishing industry is undoubtedly experiencing a prolonged transitional phase. The Newfoundland and Labrador government's White Paper on Joint Management of Newfoundland and Labrador Fisheries

states that over the past ten years, the fishing industry has been transformed from one depending almost solely on groundfish to one attempting to utilize less abundant species such as snow crab and shrimp, especially in locations where groundfish stocks have not recovered (5). Although one defining characteristic of a resource-based industry is the rise and fall of the availability of the resource, circumstances in this instance are truly unique. Rules and regulations concerning one of the province's primary natural resources are continuously being altered, reviewed or debated. The state of the province's cod fishery has been at the centre of this debate since the initial moratorium on cod fishing was instituted in 1992. At worst, the current state of the province's fishing industry is depicted by disgruntled taxpayers outside of the industry as one of massive unemployment, government bailouts and ecological disaster. The fishery is seen in these circles to have too many people and too few resources, accompanied by a failing management system. The depletion of the northern cod stock is without question the primary reason for this negative view of the state of affairs. At best, the fishery (including all species being fished) is described as a vibrant industry that continues to grow. In 2001, according to A Message From the Minister, released by the Government of Newfoundland and Labrador's Department of Fisheries and Aquaculture, the export value for fish products was $883 million, creating employment opportunities for more than 24,000 people (1). These views represent the extremes of the industry; however, most involved directly in it, see the current state of the fishery as falling somewhere in between. In any

case, the validity of these polarized statements will not be tested here. However, the current state of one of Newfoundland and Labrador's budding fisheries, sea urchins, will be examined in light of the events of the past such as the perceived failures of the cod fishery, and the mindset that pervades in Newfoundland and Labrador as a result of these events.

1.3 Historical Importance

It is first necessary to illustrate the historical importance of the fishing industry to the region and the dependency on that industry of those living in Newfoundland and Labrador. In the early 1500s, shortly after John Cabot's discovery of the island, the French, English, Portuguese, Spanish and Basques all began to take fish from the waters surrounding Newfoundland and Labrador.[2] The French, Spanish and Portuguese fished the Grand Banks off the Newfoundland coast where the fish was salted aboard ships and brought directly back to European markets. The English lacked an abundance of salt and therefore developed a system that combined light salting, followed by washing and then drying the fish in the open air. The English would fish in small boats close to shore and return to shore each day to process their catch. It was at these inshore processing sites where bunkhouses and stations used for this curing and drying of fish were set up, eventually developing into settlements

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[2] Although Cabot's landing in Bonavista in 1497 has been well documented, archaeological finds on the Northern Peninsula of the province suggest that the Norse landed there almost five hundred years previous to Cabot. For further reading on the Viking discovery, see Helge Ingstad's The Viking Discovery of America: The Excavation of a Norse Settlement in L'Anse Aux Meadows, Newfoundland.

which would surround the entire coast of Newfoundland and Labrador (White Paper 3). For centuries thereafter, the abundance of cod in the waters surrounding Newfoundland and Labrador shores has been the ultimate reason for its peoples' habitation and existence. The availability of cod was sufficient to sustain families for generation upon generation. In fact, ever since European fishing vessels chanced upon Newfoundland's Grand Banks, the cod seemed limitless.[3] For more than five hundred years, stocks were able to sustain themselves despite the strain placed on them by fishers (Nickerson 7). Although catch numbers have constantly shown sharp rises and falls over the years prior to 1992, the supply had always met the demand. Over this time, the words "cod" and "fish" became synonymous within the vernacular speech of citizens of Newfoundland and Labrador.[4] This continues to be the case, as other species such as tuna, herring, salmon and halibut are referred to by their actual names. Cod, even though it is only harvested now either as by-catch, as part of the annual food fishery, or as part of the sentinel fishery, is still referred to simply as "fish".[5]

The history of Newfoundland and Labrador is tantamount to the history of its fishery. The English and Irish immigrants who settled the region derived a

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[3] The Grand Banks are made up of 109,073 square miles of relatively shallow water where the Labrador Current meets the Gulf Stream, stirring up plankton and krill, which is ideal feeding ground for cod.

[4] For a detailed synopsis of the use of the word 'fish' in Newfoundland and Labrador as a term for cod, see Story et. al. 176.

[5] By-catch is fish caught unintentionally while attempting to catch another specific species. The sentinel fishery is a government-regulated fishery that is strictly monitored in order to gauge the progress of the species. At the time of this writing, federal Department of Fisheries and Oceans initiatives are in motion which will likely see an end to both the recreational food fishery and the sentinel fishery.

livelihood solely from the fishery. From the very beginning, they were totally dependent on the shoreward migration of northern cod. The availability of cod was a large factor in shaping the settlement patterns of the area. The Northeast coast of the island and the coast of Labrador were first settled by these Europeans where the rich fishing grounds were harvested. Supply and demand of cod continued to dictate settlement patterns, as eventually the coastline of the entire island was settled. This settlement was shaped even more precisely by specific knowledge acquired by fishermen, and passed from generation to generation as to the particular habits and behaviours of cod as they migrated from offshore to inshore waters every year (Canada History).

1.4 The Cod Fishery in Decline

The entry of Newfoundland and Labrador into Canada in 1949, as described by the provincial government in The White Paper on Joint Management in Newfoundland and Labrador Fisheries, allowed for the application of new fishing technology as well as the opportunity to introduce new types of fish products into an expanding market. The industry continued to produce salt cod, along with the fresh and frozen products that would eventually come to dominate the market (4).

The harvesting of cod off Newfoundland and Labrador's coast by foreign countries (Spain, Portugal, France, Russia, among others) is as old as the fishery itself. According to Dr. Noel Roy, in "The Newfoundland Fishery: A Descriptive

Analysis," beginning in the 1960s, the exploitation of the Northwest Atlantic cod stocks by such countries began to increase significantly. By 1968, these nations had added 2.5 times the volume to their catches as compared to catches of the 1950s. As much as this level of harvesting may well have been unsustainable, the impact on the cod stocks seemed modest at the time. During the same period, Canadian vessels were able to keep their catch levels on pace with those of the 1950s (6).

It was, however, during this same period leading up to the late 1960s that inshore fishermen in Newfoundland and Labrador began noticing decreases in their catches as well as in the size of fish caught. After 1968 the drastic effects of over-fishing offshore waters began to show in the inshore industry. In 1974, 35,000 tonnes of cod were caught, compared to 185,000 tonnes in 1954. The number of inshore fishermen also decreased during this time. In 1974, there were 12,000 fishermen, as compared to 22,000 ten years earlier (Roy 6).

This trend led to government intervention that would be the foundation of dramatic change within the fishing industry of Newfoundland and Labrador, not to mention one of many decisions that would lead to the questioning of governmental management of fishing and fish stocks. This management, or mismanagement, would be a focal point in debates and discussions surrounding the eventual closure of the commercial cod fishery in 1992. In 1977 the federal government established the Extended Fisheries Jurisdiction, or as it is more widely known, "the two hundred mile limit". This distance had been extended

from a previous limit of twelve miles, and a limit that was originally changed to twelve from three miles in 1964 (A Partial Chronology). With this new regulation only Canadian vessels would be permitted to fish the grounds within two hundred miles of the Canadian shoreline. Foreign draggers and trawlers were allowed to fish beyond it.[6] This announcement set the stage for two trends that would ultimately counteract each other. The two hundred mile limit did serve its initial purpose, as increases in domestic catches were evident following the initiation of the new zone. As a result of the rises in catch, TACs were increased to allow more fishing. However, during the same time, the number of fishermen grew tremendously from under 13,000 in 1976 to 35,000 in 1980. Therefore, the overall increase in landings did little or nothing for the income of individual fishers, as there were many more workers to share the wealth (Roy 8).[7] By the time a freeze was placed on personal fishing licenses in 1980, the damage was done, as the industry could no longer support its employees (Schrank 288). Even though this 1980 freeze on licenses was intended to cease a dangerous trend, it did very little to curb the number of individuals entering the fishery.

Even after the period leading into the late 1980s and early 1990s regulations were lax, allowing almost anyone who wished to enter the cod fishery. Registration as a part-time fisherman was open to just about anyone who wanted it. Once admitted, anyone who worked as a crewmember or part-

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[6] Draggers and trawlers are two types of larger fishing boats, usually exceeding sixty-five feet in length. The former fishes for cod by dragging the ocean floor; the latter, by utilizing a series of buoyed fishing lines.

[7] Landings refers to the amount of fish that is caught, brought to shore and sold for processing.

time fisher for a period of two consecutive years could seek registration as a full-time fisherman. In most situations this status would be granted almost automatically. Between 1986 and 1992 an average of 3,050 new entrants as part-timers entered the fishery yearly and 645 were upgraded to full-time on an annual basis (Donahue 13). These numbers persisted until immediately before Newfoundland and Labrador's cod stocks were deemed devastated by federal government fisheries scientists.

1.5 Social and Economic Relevance

The research of economist Dr. Noel Roy clearly shows the importance of the fishing industry to the socioeconomic makeup of the island. The first occupational census taken in Newfoundland in 1857 showed that 90% of the male workforce was involved in the catching and/or curing of fish (2). Just prior to 1960, Newfoundland and Labrador saw the peak of the family fishery as essentially every family in small coastal areas depended on the cod industry. Family members would work onshore to dry and salt cod that they themselves had caught. This fish would be exchanged to a local merchant for supplies designed to help the family survive through the winter. Woodcutting, subsistence farming, hunting and often sealing would supplement the supplies received from the merchant (Palmer 6). This trend continued right up to the period prior to the cod moratorium of 1992 with large percentages of communities, particularly rural communities, depending upon the cod fishery for sustenance. The major

difference is that, in the years following Confederation, the merchant system was replaced with a cash system of remuneration for catches.[8] The cod fishery itself remained integral to the survival of many people in rural Newfoundland and Labrador.

Today, as a result of diversification and development, the number of individuals who depend on the fishery has fallen to approximately 5%. However, this present-day low percentage is misleading, as it does not illustrate properly the continued importance of the fishing industry to Newfoundland and Labrador. First, this number does not include part-time fishers or plant workers. In an industry that is primarily seasonal, these numbers tend to be quite high. Second, there are regions of the province where the fishery offers the only means for employment. Although the small numbers in these communities make up a small percentage of the province as a whole, the fishery is still of vital importance to them as a means of subsistence.

The functioning of any resource-dependent community revolves almost exclusively around the availability of that resource. Without the resource, the results for the community are devastating, certainly in socioeconomic terms. This tenet can be applied to logging, mining, farming and fishing towns. One striking example comes from Bell Island, a small island approximately fifteen kilometres west of St. John's. The island community was once home to more

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[8] The merchant system, also called the "truck system", was an arrangement by which a fisherman and his family were supplied with provisions, gear, etc. by a merchant against the season's catch. For more on this arrangement, see Sider.

than 12,000 residents as it flourished as one of the most successful iron ore producing towns in the world (Weir 20). In 1966, the mines ceased production as the owners of the mining company searched for a higher quality ore that could be produced at lower cost. They would eventually find this in Western Labrador. The closure of the mines left the community of Bell Island devastated, with thousands of people out of work. The mine closures led to the single greatest one-time exodus of people from any region in the history of the province (Coxworthy 36). Population has continued to decline on Bell Island, and today holds at just over 3,000 people as residents are still forced to leave in order to search for work. Additionally, the number of people depending on social services has risen sharply, as those who have decided to stay simply cannot find work (Weir 133). Similar trends can be seen in farming towns all across Canada in recent years as the family farm becomes more and more difficult to sustain. The shift away from the rural and into the urban can be seen clearly as 80% of Canadians now live in cities; a sharp contrast to the past. The numbers are even more telling in Saskatchewan, where only 15% of the population now lives in rural areas, as the struggle to make a living from the land increases (Nemeth 19).

Exact numbers reflecting the effect of the demise of the cod fishery on Newfoundland and Labrador in general are difficult to decipher, as the transition is ongoing. Also, the immense size of the affected region makes interpretation of definite numerical trends difficult. According to Statistics Canada, the population of the province dropped by 38,862 between 1996 and 2001. Between 2001 and

2002, the population fluctuation of Newfoundland and Labrador has been estimated at approximately -.06%, with a further drop of .04% percent predicted for the period between 2002 and 2003.[9] Although there is no evidence to directly connect decrease in population to crisis in the fishery, the trends are likely not unrelated.

Socioeconomic trends can be discerned through an examination of a small town, such as Trepassey, on the Southern Shore of the island of Newfoundland. Trepassey was more than viable in the years preceding the cod moratorium, as the community was home to a fish processing plant owned and operated by Fishery Products International (FPI). The plant was supplied with codfish for processing on a year-round basis by a fleet of draggers also owned by FPI. Communities on the Southern Shore have been hit particularly hard as a result of the end of the cod fishery. For example, in the small town of Trepassey alone, FPI paid out $13 million in wages in its final full year of operation there, in addition to contributing half a million dollars in taxes, donations and purchases of services from local businesses. Economic spin-offs were influential in and around surrounding communities on the Southern Shore. This all came to a halt in 1991, when 724 plant workers were thrown out of work when the plant in Trepassey was shut down, the first major closure to hit the Southern Shore region. It was the precursor of myriad others. This culminated in the moratorium

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[9] Of note here is that population numbers for the country and the majority of provinces and territories in the country (Saskatchewan and Yukon are the only exceptions) have shown positive growth over the same time periods. A full breakdown of these statistics can be seen in Appendix I.

itself in 1992 (Southern Shore). Population numbers, according to the Newfoundland Statistics Agency in the region, tell a story of massive out-migration since the early 1990s, with Trepassey shifting from 1375 people in 1991 to 1084 in 1996, and down to 889 in 2001, representing a 35% decrease in population over a ten year span. As a result, the face of rural Newfoundland has changed, as young people no longer see staying in rural communities a viable means towards an acceptable standard of living. Seniors' centres are growing in numbers in rural communities, and will likely continue to do so, as the percentage of people living in the province over the age of 65 is expected to double in the next fifteen years (Southern Shore). Younger generations are not filling the positions left by an aging population as they are forced to out-migrate to larger centres, often outside the province.

1.6 Reasons for Moratorium

In 1992, John Crosbie, then Federal Minister for Fisheries, ordered the fishing grounds around Newfoundland waters closed. This announcement would eventually reshape the structure of numerous Newfoundland and Labrador fishing communities, as described above. At that time, it was estimated that the number of cod present in waters surrounding the province was no more than a mere 25,000 tonnes. This pales in comparison to the 800,000 tonnes of fish that were caught and harvested in the peak season of the cod fishery in 1968. The original hope at the time was that a moratorium on cod harvesting for a period of

two years would give the fish ample time to replenish. At the time of this writing, the Newfoundland cod fishery is a mere shadow of its former self, and is no longer the cornerstone of the Newfoundland economy, or even the fishery for that matter. In fact, another moratorium was announced in 2003, this time on the Gulf fishery that had initially been spared in the announcement of 1992 (White Paper 1). [10]

Widespread blame and numerous explanations have been offered for this travesty, ranging from an uncontrolled number of seals, believed to be among the chief predators of cod, to unusual changes in water temperature. Changes in the migratory patterns of the species have been considered, in addition to the fact that huge fluctuations in population have always been normal for cod (Comeau). Undoubtedly, these factors have been influential in moving the cod fishery towards its current status. However in recent years, after much finger pointing, a consensus has been reached concerning detrimental factors to the fishery other than the ebb and flow of nature. It was, in essence, a case of gross ecological irresponsibility, both by foreign fishing fleets and Canada's own vessels. In two decades of reckless over-fishing that was encouraged and legislated by government, what once was the richest fishing ground in the world was decimated to the point that the northern cod is now an endangered species (Nickerson 2).

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[10] The Gulf fishery is the term used to describe the fishery on the West Coast of the province. This fishery falls in Zone 4R. For a map of Fishery Management Zones, see Appendix II.

1.7 The Tragedy of the Commons and Its Results

The situation that resulted in the depletion of this fish stock is an example of what is known as "a tragedy of the commons." In 1968, biologist Garrett Harden penned an extremely influential article explaining why a scarce resource open to all is subject to overexploitation. In explaining his concept, Harden used a pasture area as an example of a "commons" area. Eventually every pasture will become overgrazed because herdsmen can continue to add cattle to the pasture, reaping all of its benefits, while incurring only a small fraction of the costs—the harm caused by excessive grazing. This is a cost shared by all herdsmen. The "tragedy," according to Harden, is that these individuals are bound to a system that leads to the ruin of the resource (1244). This idea refers to the notion that the commons is an unregulated, openly accessible, or anarchic regime (Harden and Baden xii). Essentially, as this concept relates to the fishing industry, it means that too many people were after too few fish within a specified common area.

As a result of this tragedy, cod was the first commercial marine fish species to be studied by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), an organization that develops Canada's national list of species at risk. Dr. Kim Bell, a specialist in fish ecology, reported to COSEWIC on the northern cod stocks off the Newfoundland coast in the mid-1990s, after

three years of research. A portion of the report stated that, "On a by-management area basis, the advised designations range from Lower Risk to Critically Endangered ... As a single unit, the advised designation ... is ENDANGERED" (Comeau). Comeau asserts that this opinion was reached after reviewing hundreds of documents from independent scientists, including reports from the DFO, the federal department responsible for the management of the cod fishery (1). This notion was reiterated in May 2003, when it was noted that cod stocks off the Northeast coast of Newfoundland had declined by 97% over the past thirty years ("Newfoundland Cod").

1.8 After the Cod – The Fishers

The collapse of the ground fishery in Newfoundland and Labrador obviously had dire and far-reaching consequences that extend beyond the depletion of a fish species. In addition to the drastic ecological change there has been tremendous social transformation. It is an unfortunate irony that, in this case, the ecological change that forced people to adapt was brought on by a situation those very people created. In this case, the activity is, of course, over-fishing. Accepting that over-fishing has been essentially the result of mismanagement on the part of all levels of government has been a tough pill to swallow by those directly involved. With the commercial extinction of the northern cod stocks came the termination of some 35,000 jobs in the province of Newfoundland and Labrador, including both fishers and plant workers. This

massive shutdown of the industry was described by Canadian historian Jack Granatstein as "the biggest layoff in Canadian history" ("Northern Cod" 2). This number, however, does not take into account the numerous businesses, families, and community organizations dependent on the work and income of those fishers and plant workers.

In addition to the demise of a resource and a workforce has also come the death of a certain way of life that had come to be associated with a life linked to the sea in Newfoundland. In order to fully understand the consequences for those people directly influenced by the end of the cod fishery, it is first necessary to understand exactly what it means to be a fisherperson and/or fish industry labourer. The occupation of fishing itself is physically demanding, dangerous, unpredictable and isolating, requiring a commitment that goes far beyond merely collecting a paycheque. As such, this vocation leads to an individual's strong identification as a fisherman. Fishing requires hard work in the hope of attaining high rewards. This way of life not only molds a set lifestyle for the sea-based fisherman, but directly affects the lives of the fisher's family, whose daily lives are invariably affected by his/her vocational choice (Lloyd and Mullen 2).[11]

Isolation of a group, along with the possession of a peculiar knowledge in an occupation that is obviously dangerous, are preconditions outlined by Wm. Hugh Jansen in "The Esoteric-Exoteric Factor in Folklore" that leave a group

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[11] The subject of fishing is prevalent in Newfoundland and Labrador song, art, and narrative, and spills over into the expressive life, and has become a part of the identity of many people in the province, including those not directly involved in the occupation. For a more detailed look, see Peter Narváez's "She's Gone, Boys: Vernacular Song Response to the Atlantic Fisheries Crisis."

subject to the esoteric-exoteric factor (49).[12] According to Jansen, "the esoteric applies to what one group thinks of itself, and what it supposes others think of it. The exoteric is what one group thinks of another and what it thinks that other group thinks it thinks" (46). Although the act of commercial fishing is a business, the group involved is without question a distinct one. The attitudes and beliefs of these individuals set them apart from other groups in society. This distinctiveness develops not only based on how others view them (exoteric images), but also based on how they perceive themselves (esoteric images). According to Lloyd and Mullen, fishing is defined as the exchange or trading of fuel, equipment and human effort for fish. While the former costs money, the latter generates cash. All the techniques utilized in a particular fishery aim towards minimizing the amount of expense and effort needed to catch the maximum amount of fish. Within the industry, inexperienced fishermen learn their trade informally through direct observation of experienced fishermen in the course of day-to-day activities. Orders are followed and actions demonstrated by others as they refer to accepted ways of doing everyday work. Solutions to problems are improvised if traditional methods fall short. Once this body of knowledge is acquired, an individual becomes a member of a fishermen's group (2). Lloyd and Mullen further argue that once a specialized work skill is mastered, it becomes a source of occupational identity and a cause for pride (69). This essentially is the building of what Robert McCarl refers to, in his

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[12] The dynamics of the group of sea urchin fishers, their vernacular knowledge, and the dangers of their work will be discussed in detail in Chapters 4,5 and 6.

analysis of firefighters in the District of Columbia, as the "canon of work technique". This is an informally held cultural standard that is rigid enough to perpetuate traditional rules of conduct, yet elastic enough to allow for variation within the group (28). The canon of work technique is what allows a fisherperson to identify himself/herself with the occupation of fishing, or themselves as a fisher. This identity is in danger of being lost as an entire generation of workers has been left without a traditional occupation with which to relate.

The stereotypical view of the fisherman by outsiders has often been quite negative. Those who identify with the occupation may have very different views, when compared to those with no experience with the fishing industry. Commercial fishers are most often portrayed as either hardy individualists, working with or against nature in ways that others cannot possibly imagine, or as poor, uneducated idlers and drinkers who contribute to the ill-being of the communities where they live. The former view is usually that perpetuated by fishermen themselves, whereas the latter is a negative stereotype held by some outsiders (Lloyd and Mullen 4). Even when the Newfoundland cod fishery was at its peak, it was for the most part, certainly when considering the inshore sector, a seasonal industry, often leaving fishermen and plant workers with little or no gainful employment during the long winter months. During this period, most who were dependent upon the industry turned to federal Employment Insurance (EI) benefits in order to supplement their income. Because of the large numbers involved in the fishery, the number of Newfoundlanders turning to this

government program on an annual basis was consistently around double the national average (Rowe 1).[13]

This image of Employment Insurance dependent fishers was further supported in the early 1990s with the onset of the cod moratorium. At this time, Ottawa's emergency response to the fisheries crisis was a fiasco like few others in Canadian history. In 1992 and for the five years that followed, the federal government, through programs such as The Northern Cod Adjustment and Recovery Program (NCARP) and The Atlantic Groundfish Strategy (TAGS), paid out more than $2 billion in efforts to correct the wrongs of mismanagement. The programs were designed to retrain fishermen and plant workers for jobs outside the fishery while buying up their licenses and crafts, in order to decrease the number of fishers should the cod ever come back. However, this program was perceived by many as no more than a thinly disguised welfare program that did little to teach new valuable skills or convince large numbers of fishers to retire (Nickerson 10).

The sense of autonomy that develops as a result of being in control of one's occupation has suffered greatly in Newfoundland since the fall of the cod fishery. Rural Newfoundland's numerous small coastal communities relied almost exclusively, in the past, on the fishing industry. Because of this shared experience, a strong sense of identity, community and eventually autonomy has

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[13] Rowe's analysis illustrates that the Newfoundland and Labrador unemployment rate has consistently been between 16% and 20%, with slight fluctuations depending on peaks and valleys in seasonal occupations, such as fishing. These numbers apply to the 1970s and early 1980s. This percentage has essentially gone unchanged in subsequent years. Statistics Canada calculates the Provincial unemployment rate at 16.9% for the year 2002.

existed. In addition, a strong sense of nostalgia remains. As Keith Halleran, a former fisherman from the town of Trepassey says:

> We used to count ourselves a blessed people. If no one got rich, no one was poor. It was a community as close-knit as you can imagine. It was a community living close to nature but with all the modern amenities. Hardly anyone wanted a different life. (Nickerson 9)

The cod fishery was an industry whose employees had a large amount of freedom in terms of how they went about the day-to-day operation of their ventures. Fishing berths were decided in an organized fashion within individual communities.[14] Small boat owners were permitted to hire sharemen however they saw fit.[15] Hours of operation were completely up to the boat owners. During trap season, traps may have been hauled once, twice or three times a day depending on the availability of fish and the gumption of the fishers. The entire operation of the fishing vessel was in the hands of each individual fishing crew. Some regulations were in place designed to preserve the quality of catches. These, of course, were in the best interest of the fishermen themselves, as better quality would bring better prices. Quotas for inshore fishers were rarely reached. Ironically, it was these large total allowable catches that would lead to the demise of the fishery, and the loss of this accustomed autonomy and freedom within the occupation.

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[14] A fishing berth, or location where a particular vessel was allowed to fish, was usually selected through a random draw organized by the inshore fishers in a community.
[15] A share refers to the percentage of the profits granted to each member, or shareman of a fishing crew.

1.9 The New Fishery

The 1990s then, for obvious reasons, has seen a period of vast diversification in the Newfoundland fishery. The term "fishery" no longer solely means the cod fishery. Through necessity and ingenuity, in conjunction with environmental and ecological factors favourable to other species, an effort has been put forth to create new opportunities involving previously underutilized species. Although this effort has not and probably will never compensate for the collapse of the cod fishery, particularly in terms of employment numbers, there is potential for continued growth.

The species whose fishery has shown tremendous growth in recent years has been that of crab. Since cod stocks were depleted, crab stocks have soared, as the former is known to be a major predator of the latter. The crab fishery became something of a saviour for the Newfoundland fishery in 1995, and by 1996, had an all-time landed value high of $330 million, for 37,500 tonnes, also a record high (Newfoundland Fishery Diversification). However, by 1999, snow crab harvests reached a level of approximately 69,000 tonnes. This number increased from a harvest of only 16,000 tonnes in 1992. Following the 1999 season, scientific studies showed a decrease in the number of healthy juvenile crab, prompting the government to reduce 2000 quotas by 25% in order to help protect the stock. However, justified or not, the federal government refuses to acknowledge that over-fishing or mismanagement may have been factors in the decline of crab stocks. In 1999, John Efford, then provincial Minister of Fisheries,

stated that the federal government was insisting that the absence of healthy juvenile crab is but a cyclical fluctuation in the resource. If at some time in the future over-fishing is admitted, it will in all likelihood be too late to save the resource – again (Newfoundland Statement).

Further questioning of the role of the federal Government of Canada in the management of Newfoundland's fisheries has arisen of late, specifically regarding the nearly complete closure of the cod fishery, encompassing all but the South Coast of the island, in May 2003.[16] Roger Grimes, Premier of the province, at the time, called for a constitutional amendment that would see Newfoundland share jurisdiction of its fishery with Ottawa. Grimes said:

> Again, we have a made-in-Ottawa decision thrust upon us without regard and respect for the consensus of the people of this province. Federal management of the seacoast fisheries since 1949 has failed to adequately protect or develop the principal fisheries. Failed federal fisheries management has led to the complete collapse of the northern cod fishery and other groundfish stocks. This situation can no longer be allowed to stand. Time is running out to save our fishery in Newfoundland and Labrador. ("Nfld. Seeks")

Whether Grimes' efforts are successful or not, research suggests that fisheries do not easily regenerate following a depletion such as that of the cod species.

University of Maine fisheries biologist Bob Steneck has stated that:

> It's not just if you over-fish something, just reduce the effort and the fish will come back. We have reason to believe that there are some places where we can stop fishing and it wouldn't have any effect, because we've changed the ecosystem. The reason is the inter-connectedness of life in the ocean. As one fish disappears, other species settle in the niche it used to occupy, leaving no room for it to return. (Porter)

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[16] For a table illustrating major fisheries under moratorium or declining in Newfoundland and Labrador, see Appendix III.

With this in mind, it is quite conceivable that lessons of the past may not be enough to prevent future disasters. Mismanagement issues continue to prevail. Fear remains that federal management of the fisheries could again lead to collapse, wiping out new industries that have emerged since the moratoria of the 1990s (White Paper 6).

An economically feasible fishery with conservation concerns at its core, in addition to the social well-being of its workers, is a fishery that all concerned would likely endorse. Finding this happy medium is without question difficult. In order to identify fisheries with potential for these rare characteristics, it is necessary to look into the fledgling fisheries of Newfoundland. The sea urchin fishery essentially remains in its infancy in Newfoundland, as the numbers of people involved are still quite small. Also, scientific knowledge of the harvesting of sea urchin is still quite limited, although biological knowledge of the species is vast. This rare set of circumstances sets the stage for what potentially could be a fishery monitored and regulated by those directly involved, in conjunction with science – a true participatory management fishery.

Understanding how the sea urchin fishery came to be part of the Newfoundland fishery requires an analysis of the evolution of the sea urchin industry. Chapter 3 traces the history of sea urchin fishing around the world from 7000 B.C. to the present day fishery in Newfoundland and Labrador. Purposes for, and methods of fishing are looked at across time and place, culminating in a

comprehensive examination of the precursors of the sea urchin fishing industry today.

Before delving into the history of the sea urchin fishery, Chapter 2 focuses on the theoretical basis of this study, essentially covering two separate schools of thought: vernacular theory and occupational folklife theory. An understanding of these concepts is essential to the case study that follows.

Chapter 2: Literature and Theoretical Review

This chapter outlines the theoretical framework used in this study, specifically ideas relating to the dynamics of the occupation of sea urchin fishing and the importance of vernacular knowledge of the workers within the occupation. A full discussion of the specifics of the occupation cannot go forward without exploring both vernacular theory and occupational folklife theory in order to understand the formation and advancements in each.

2.1 Vernacular Theory

Margaret Lantis was one of the earliest scholars to use the term "vernacular" as a descriptor of culture in her 1960 article, entitled "Vernacular Culture." Lantis reaches to Webster's definition of the term which deems the vernacular to be that which is, "common of a locality, region, or, by extension, of a trade or other group: the commonly used or spoken as distinct from the written." Lantis saw a necessity in using the term, as she suggested that other lexicon such as "mores", "folkways", and "customs" conventionally used to describe culture were inadequate, as they lack an organizing principle and carry connotations of the past or of tradition (202). Using the term "vernacular" frees that which is being described from ideological baggage associated with more commonly used terms.

nationalism", first saw the necessity of looking to the peasants in Germany to spark a national consciousness in its citizens who had become lethargic in their regard for their country (Wilson 820). According to Herder, Germany had begun to lose its true sense of nationality at the end of the Middle Ages. So-called foreign influences brought on by the Renaissance interrupted what Herder deemed to be native traditions, thus leading to this loss in national identity. In order to regain its lost national soul, Germany would have to return to the mindset it had abandoned in the Middle Ages, re-focusing on the natural, the spiritual, the romantic, and eschewing the scientific. True cultural development could only take place, thought Herder, if Germans returned to the point where the initial break took place (Wilson 824). For Herder, the method of connecting the past and the present for Germany lay in the language of folk poetry.

Herder's concept of folk poetry came from reading the works of Giambattista Vico, upon which portions of Herder's theories are grounded. According to Vico, the first poets were actually historians who spoke in a metaphorical language. He claimed that the early writings of Greek mythology were actually based on real events. Therefore, according to this idea, poetry could be used to learn about history and discover information about the past (Wilson 825). Herder believed that by studying the folk poems that still existed among Germany's peasants, the history of Germany could be understood. William Wilson further argues that, aside from using folk poetry to understand the country's history, Herder took from Vico the notion that folk poetry also contained

the key to the cultural patterns of the era in which it was written (825). In looking at the peasants, Herder considered them unspoiled by outside influences. He also claimed that they retained the songs and traditions created by Germans in days long past. Herder stated that:

> a nation...has nothing more valuable than the language of its fathers. In it lives its entire spiritual treasury of tradition, history, religion, and principles of life, all its heart and soul. To deprive such a nation of its language, or to demean it, is to deprive it of its sole immortal possession transmitted from parents to children. (Wilson 827)

Thus for the first time, in a folkloric context, value was placed on the knowledge of the non-dominant class, in order to complement that of the dominant class, in the hopes of bettering conditions for all in a specific society.

Peter Burke, in Popular Culture in Early Modern Europe, also looks at the work of Herder and his contemporaries and what separated them from antiquarians who had taken part in collecting endeavours of various customs or ballads in the past. Burke says:

> What is new with Herder and the Grimms and their followers is, first, the emphasis on the people, and second, their belief that 'manners, customs, observances, superstitions, ballads, proverbs, etc., were all part of a whole, expressing the spirit of a particular nation.' (8)

Burke reiterates the drive to escape the influence of foreign domination in an effort to regain traditional culture. Burke addresses problems with Herder's notion that the 'people' or the 'folk' were essentially peasants. For purposes of popular culture studies, Burke states that a liberal cross section of a society should be utilized:

> For the discoverers, the people *par excellence* were the peasants; they

lived close to nature, they were less tainted by foreign ways and had preserved primitive customs longer than anyone else. But to say this was to ignore important cultural and social changes, to underestimate the interaction between town and country, learned and popular. There was no pure unchanging popular tradition in early modern Europe, and perhaps there never had been. Hence there is no good reason for excluding town-dwellers, whether respectable craftsmen or Herder's 'mob', from a study of popular culture. (22)

Once consensus has been reached on exactly who possesses the beliefs, practices and traditions that define a society, the task becomes proper recording and/or collecting of the relevant information. Proper methods of collecting, documenting, and/or understanding the indigenous lives and/or knowledge of specific groups is the focus of Clifford Geertz in "'From the Native's Point of View': On the Nature of Anthropological Understanding." Geertz discusses his own fieldwork in Java, Bali and Morocco, and asserts that the ethnographer cannot sense exactly what it is that his/her informants perceive. In fact, the ethnographer can only hope to understand what it is that local people perceive "with" or "through" (Geertz 224). Geertz explains the dilemmas that ethnographers face in attempting to understand native cultures or societies:

> Whatever accurate or half-accurate sense one gets of what one's informants are really like does not come from the experience of that acceptance as such, which is part of one's own biography, not of theirs. It comes from the ability to construe their modes of expression, what I would call their symbol systems, that such an acceptance allows one to work toward developing. Understanding the form and pressure of, to use the dangerous word one more time, natives' inner lives is more like grasping a proverb, catching an illusion, seeing a joke – or, as I have suggested, reading a poem – than it is like achieving communion. (236-37)

Grasping how natives perceive their world or their sense of self within their world, according to Geertz, is best achieved by, "searching out and analyzing the

symbolic forms – words, images, institutions, behaviors – in terms of which, in each place, people actually represented themselves to themselves and to one another" (225). It is therefore Geertz's contention that the ethnographer must act almost as a detective, who pieces together various clues of a culture in order to solve the overall puzzle of a society.

Studies on how such bodies of knowledge serve particular groups and how this knowledge is transmitted within these groups have been conducted by many, including Barre Toelken, in "Folklore, Worldview and Communication." Here, Toelken examines the differences between Anglo-American and Native Indian culture and worldview in the United States. He specifically delves into the successes and failures that arise when both groups are subjected to similar educational policies within school systems. Toelken suggests that worldview, in both cases, "is inculcated at a very early age through the informal, traditional agencies familiar to folklorists" (267). He further states that worldviews are:

> learned chiefly before school age and thus pose a distinct (but generally unrecognized) problem for the teacher who feels all normally endowed students start off with potentially the same mental chance; that every ethnic group in America has a distinct worldview which continues to be passed on to its young (even among those urban groups who allege that they are above tradition); that, because worldview is communicated traditionally and is expressed constantly in traditional modes, folklore represents one of the best approaches to its study. (268)

According to Toelken, Anglo-Americans adopt a "lineal progression and grid system" mode of thinking in childhood that shapes the way they observe and interpret the world around them. This comes through observing their parents and the way they function within their environment. It is this mode of thinking that

causes Anglo-Americans to focus on time, and a seeming obsession with the future (269). Toelken looks to Alan Dundes' "Thinking Ahead: A Folkloristic Reflection of the Future Orientation in American Worldview" to identify Anglo-American obsessions with such temporal issues as knowing where one wants to be at a particular point in the future, as reflected in common queries such as "What do you want to be when you grow up?" In addition, it is this learned mode of thought that acts to shape the constructed geography of the environment, seen in such things as the linear structure of our cities, houses and classrooms (270).

Native Indians, on the other hand, learn an opposing worldview regarding their own environment. Toelken states that the Indian world is much more circular than the Anglo-American world. He gives examples:

> The young Indian child is encircled, first by his family, then his clan, then his tribe, then his natural setting. The dwellings of most tribes were, and still are round, and the encampment itself was usually not set up according to a grid pattern. (273)

In addition, the native Indian method of viewing time is very much past-oriented as opposed to future-oriented. The past provides a wealth of information that individuals need to function in the present. The individual is surrounded by understandings of the past (274).

These polarized mindsets provide the basis for differing cultures, and according to Toelken, help explain difficulties that are encountered when one group is required to function within the cultural premises of the other. These differences originate from the body of knowledge that is acquired through

parental example and expectation (271). This indigenous knowledge is integral in differentiating between specific cultures.

The place of indigenous knowledge in rural development is the focus of Njoku E. Awa's "Participation and Indigenous Knowledge in Rural Development." Awa explores the different classifications of management systems in working class cultures. Among these are exploitative-authoritative and benevolent-authoritative systems, both of which see workers treated almost as objects that are manipulated by management. Consultative systems, on the other hand, encourage communication between management and workers. However, when decisions have to be made, management still places little faith in the opinions or knowledge of workers. The fourth category, a participative-group management system, enlists full participation of all workers in the activities of an organization (306). It is this fourth category that Awa is most concerned with, as he examines the importance of indigenous knowledge systems in rural development. Awa cites several studies conducted in Third World cultures that identify the vast knowledge of local peoples in areas such as botany and plant taxonomy, whereby locals actually held more knowledge than professionals in the given areas. On the heel of such studies, Awa discusses the movement to harness the knowledge of these indigenous people in attempts to revitalize rural development plans in their locales, making the individuals equal participants (314).

In "Using Indigenous Knowledge to Improve Agriculture and Natural Resource Management," Billie R. Dewalt explores the values, strengths and

weaknesses of both indigenous and scientific knowledge systems. First,

regarding scientific knowledge, Dewalt states:

> The strengths of scientists are that a) they come to know an extraordinary amount about very limited areas of knowledge; b) they become very savvy about the principles or mechanisms by which things work (through the construction of theoretical knowledge); c) they have a very effective means – the scientific method – by which to approach problems and to engage in explanation; and d) the knowledge that is produced is transferable across time, space and societal setting. As practiced, these strengths have also created problems for science. The reductionism of science often leads to a woeful ignorance of the wider context within which the particular phenomena under study occur. One problem is that the selection of phenomena to be studied is determined by the ability to break it down to "researchable pieces". Complex systems, and those characterized by myriad interactions are likely to be ignored. A second problem is that scientists often activate the change of one part of the system without paying attention to the results of the overall system. A third problem is the tendency to focus only on the short term, not looking at what the potential long term implications of a change in technology might be. (124)
>
> More problematic perhaps, is that science has created a certain hubris among those who practice it. Many scientists have lost touch with the ultimate goals of what they are trying to accomplish because of their isolation. (124)

Indigenous knowledge, like scientific knowledge, has advantages and

drawbacks. In referring to Jack Kloppenburg, Dewalt points out:

> Perhaps the greatest strength, as well as the greatest weakness of [indigenous knowledge] systems, is that they are local. As Kloppenburg has pointed out, local knowledge produces what he calls "mutable mobiles" – relatively malleable knowledge that is finely tuned to the continually changing circumstances that define a particular locality. That is, the comparative advantage of local people is that a) they are very savvy about their local environment and have accumulated a lot of experience concerning those things that affect their existence; b) many of them have a keen awareness of the interconnectedness of plants, animals and soils – their interrelationships and ecology; and c) they have become very ingenious at making do with the natural and mechanical resources at their disposal. The problem is that indigenous knowledge is very rich in

> contextual detail but is immobile, having little utility outside of particular places. (125)

Dewalt deduces that both knowledge systems must be utilized in conjunction with one another. Dewalt reaches this conclusion following an assessment of several case studies whereby each type of knowledge system was utilized in a management capacity with varying degrees of success.

Ellen Bielawski's article, "Inuit Indigenous Knowledge and Science in the Arctic," explores how both indigenous and scientific knowledge can be integrated in order to manage various wildlife species and other resources. In doing so, Bielawski first discusses how knowledge is acquired by the Inuit. Four methods are deciphered. An individual may receive knowledge directly from an older family member. Secondly, he/she may simply attempt to carry out a task, thus learning the correct or incorrect method for doing so. Thirdly, a person may hear the information from another individual, and finally, he/she may pick up new information by watching or seeing someone else carrying out an activity or task (Bielawski 221). From a scientific standpoint, Bielawski identifies the attitude of scientists towards Northern regions and notes that the knowledge of indigenous peoples there is seen as a problem (225). Although the situation is improving, there is still an imbalance when it comes to using both forms of knowledge in resource management in the Northern communities explored. Bielawski says that management schemes are still predominantly western, scientific and bureaucratic (227).

Connections between theoretical frameworks discussed here and the task in this study are evident. The purpose of the initial works of Johann Gottfried Herder was to escape the cultural bounds that were being placed on Germany by outside forces. It was an effort by Herder and his contemporaries to regain a cultural autonomy of sorts. Herder saw a link between the vernacular and this autonomy. In resource management schemes today, it is necessary to incorporate the vernacular, just as described by Dewalt, Awa and Bielawski. This approach will ensure success as well as certain autonomy by those involved with such resources. Although this balance is not easily achieved, as Toelken lays out, it is through a concerted effort to understand a culture that the boundaries between ideals can be deconstructed. The vernacular knowledge of the sea urchin fisher needs to be fully understood in order to begin to incorporate this body of knowledge into a management scheme of the resource this group depends so heavily upon.

2.2 Occupational Theory

Occupational folklore studies have been largely influenced by an understanding of what constitutes folklore studies, which has in turn been determined by an evolution in the basic definition of folklore. Alan Dundes, in "What is Folklore?" defined folk as "any group of people whatsoever who share at least one common linking factor" (1). The 1970s saw an expansion on the definition of folklore, which was heavily influenced by the publication of Toward

New Perspectives in Folklore, edited by Américo Paredes and Richard Bauman. "Toward a New Definition of Folklore in Context" by Dan Ben-Amos was paramount in formulating this new understanding. Essentially, Ben-Amos concludes that folklore is "artistic communication in small groups" (13). This definition, once accepted, opened the door for occupational folklore study, as it is understood today, as the bounds regarding just who and what would be looked at were lifted. Ben-Amos left behind antiquated notions of what folklore is and who the folk are, and created a definition that does not reflect the once accepted view of the folk as an isolated, agricultural, peasant class.

Archie Green was also instrumental in advancing the field of occupational folklore studies through his development of the Working Americans component of the Festival of American Folklife, which was organized by the Smithsonian Institute in the late 1960s. This was modelled after the European concept of the "living museum". Green highlighted contemporary industrial workers at the festival, who displayed their craft and skills to an audience who had never thought of industrial workers as possessing any type of folk traditions (Santino 319).

In his "A Folklore Approach to Emotions in Work", Michael Owen Jones states that the discipline of folklore has long incorporated occupational studies into its realm. Early works were essentially collections that looked at the songs, stories and beliefs of workers in occupations that have been traditionally romanticized, such as cattle ranching, mining, logging, seafaring, oil drilling and

railroading (280). One of the earliest such volumes is Cowboy Songs and Other Frontier Ballads, by John Avery Lomax which contains over two hundred song lyrics, some with music, depicting cowboy life in the old west of the United States. According to Jones, the shift into more in-depth occupational folklore studies came in the 1970s and 1980s with the advent of organizational folklore studies and the symbolic communication within these organizations (281).

This symbolic communication is analyzed by Bruce E. Nickerson in "Antagonism at Work: Them and Us, A Widget Worldview". In this piece, he explores the age-old conflict in the work environment, that of the worker against management. Nickerson identifies the various ways in which this conflict or opposition manifests itself. He looks at cautionary tales, which were originally identified by Jack Santino as functioning didactically in order to warn workers of the potential physical dangers of the workplace, as also functioning as part of the "us versus them" dichotomy. Nickerson found, in tales he collected, that workers who recounted these tales were also convinced that the company did not care for the safety of the worker as an individual, but was only concerned with the impact of company safety practices on their insurance premiums (312). In addition, Nickerson looks at various other practices in the workplace that symbolize the workers' disdain for management such as ethnic slurs, the wearing of unique clothing to separate worker from management, theft of company property and various methods of "beating the system", such as breaking or hiding defective

equipment, and then convincing management to pay the worker to repair or replace the defective parts (314).

Jack Santino, in "The Outlaw Emotions: Narrative Expressions on the Rules and Roles of Occupational Identity," also studies symbolic or artistic communication that is present within various occupations. Santino illustrates his points using airline industry workers, telephone company workers and railroad workers. Paramount in his work is the relationship between what Santino calls superordinates and subordinates on the job (320), the former representing employers/management, and the latter employees. Santino examines occupational narratives as the vehicle for indirect expressions of conflict between the two. He found numerous examples of narratives told by subordinates involving other subordinates who carried out a sort of heroic act or prank at the expense of a member of the superordinate group (320). Other narratives involved initiation pranks carried out by seasoned veterans at the expense of the newcomers or rookies. These pranks might involve activities like sending the newcomers on a wild goose chase in search for a nonexistent tool (321).

Susan L. Scheiberg discusses the ways various employees decorate their work environment in "Emotions on Display: the Personal Decoration of Work Space." Scheiberg is interested not only in how and why workers decorate space, but also what these decorations mean (330). She comes to the conclusion that no matter what workers do to manipulate, enhance or change their work environment, it undoubtedly is connected to their efforts to make their

workplace a more satisfactory place to be. The communicative powers within this personalization are also evident, according to Scheiberg, as one worker's willingness to conform to the decorative standards laid out by co-workers illustrates his/her level of satisfaction within his/her job. Conversely, an unwillingness to conform, symbolized by decorative practices out of line with co-workers, or lack of decorative undertakings, illustrates a worker's discontent with his/her current work environment. The level of personalization evident in one's workplace, or lack thereof, may be influenced by various factors including the individual's taste, length of employment and/or number of hours put in on the job (325).

Peter Narváez analyzes the methods that CBC reporters use to vent their frustrations with their work in "I've Gotten Soppy: 'Send-Off Parties' as Rites of Passage in the Occupational Folklife of CBC Reporters." Many of these expressive forms are part of the "canon of work technique" or the informal knowledge that is required to get the job done (341). Some of these methods include the playing of pranks, informal gatherings outside of the work environment to vent, and send-off parties (346). Narváez discusses these send-off parties under the guise of rites of passage, as originally laid out by Arnold van Gennep in 1908. These parties demarcate the construction and destruction of various occupational networks, as employees advance to new positions, move to new companies or jobs, or retire. Although this movement often means the breaking of occupational networks, Narváez uses the various stages of the rites

of passage to explain that the organization essentially is able to reinforce its sense of stability at these parties and maintain the status quo (347).

In much of the literature on occupational lore, as cited here, the reason for the development of various practices and traditions in the workplace often stems from the divide between those in management and those in non-management positions. The overwhelming sense of those in non-management roles is that they know more about the day-to-day operations of the industry or resource than do those in management positions. In addition, they often sense that their knowledge is not appreciated or held as valuable by those in charge. This separation is clearly evident in the sea urchin fishery, as the bodies of scientific and vernacular knowledge related to the industry remain for the most part separate.

Also of interest here is the work that has been conducted since the fall of the cod fisheries and the subsequent moratoria in terms of efforts to revitalize rural Newfoundland and to curb the tendencies toward economic dependence on government handouts. Sean T. Cadigan looks at the cries for better management that were made by fisherman throughout the years leading up to the closure of the cod fishery, and asserts that these efforts or calls for participant management were by no means new. Cadigan delves into the early to mid 1800s in Newfoundland and outlines the protests that were made by local fishermen when more intensive harvesting gear was introduced. At the time, these new technologies included trawl lines and cod seines, and protests would

take the form of actual destruction of this new equipment by traditional hand line fishermen (Cadigan 17). Cadigan reports that these types of destructive attacks on newer equipment continued into the 1860s, and that pleas for support from government were all but ignored. This is because government hoped that new technologies and innovations in the fishery would help to maintain or even increase salt fish exports at the time. At any instance where it was suggested that fish stocks were suffering, government tended to place the blame on foreigners, and insist that new fishing grounds were always available, thus suggesting that concerns were unwarranted (Cadigan 19).

Cadigan goes beyond the cod fishery by discussing the seal harvest of the late 1800s, and again cries of local peoples for proper management. The early seal hunt in Newfoundland was an inshore affair, as cod fishermen would look to the hunt in the spring season as a means of making up for shortfalls of the last season's cod fishery. However, the dawn of steam ship technology in the 1860s saw great mercantile investment in schooners capable of taking the seal hunt offshore to where harp seals would breed in large numbers. Many outport Newfoundlanders saw this as an overexploitation of the seal herds as the ships sailed too early, taking too many immature and breeding age seals, while also wasting much of the kill. Again, government did little to curb these trends as conservation concerns dwarfed in comparison to employment needs and merchant investment (Cadigan 21). Concerns over forestry resources in the

1870s also accomplished little, as government saw the cutting of forests in the interior of the island as a step towards future industrialization (Cadigan 24).

Cadigan deems the recent collapse of the cod fishery in Newfoundland and Labrador as a cumulative result of years of mismanagement on the part of government, and their inability historically to incorporate the views and knowledge of outport Newfoundlanders as they attempted to survive in what Cadigan refers to as the "moral economy". By this, he means that people would morally regulate themselves regarding access to resource materials that were essentially responsible for the continuation of their communities. They did this more so out of concern for their own welfare and the survival of their descendants than they did out of respect for nature (36). Cadigan suggests that government's underlying plan has always been to move Newfoundland away from dependency on the fishery and toward other industrial development and diversification (35). Such policies, having largely failed, have contributed to large-scale neglect of conservation, and thus, the near extinction of cod.

Looking specifically at why fish stocks do indeed collapse, Barbara Neis and Rob Kean examine the shortfalls of scientific management and make a case for a more inclusive style in "Why Fish Stocks Collapse: An Interdisciplinary Approach to the Problem of 'Fishing Up'". A need for communication between scientists and those with local knowledge is suggested when looking to acquire data regarding stock abundance in specific areas during specific time periods, as well as the efficiency of particular harvesting methods over geography and time

(Neis and Kean 87). In addition, knowledge of fishers should be considered regarding by-catch, as science traditionally has studied one species through landed catches, while not considering what else is being taken or what is discarded (Neis and Kean 88). Neis and Kean state that the tendency in fisheries management has been to regard a stock collapse as an isolated incident, and not as a result of what is termed 'fishing-up' (93). This essentially refers to the practice of reacting to downward shifts in stocks through expansion and reactive crisis management techniques and technologies that do little more than make matters worse, mainly due to shortcomings in scientific research (Neis and Kean 94). The authors insist in their work that the only way to avoid further blunders is through a more holistic approach generating new insights within the realm of resource management (93). Lessons can be learned from the mistakes of past fisheries and ideas from the literature presented in this chapter can be applied to alternate fisheries. This study aims to integrate theory and practice as it relates to the fledgling sea urchin fishery in Newfoundland and Labrador. The case study is introduced in the next chapter with a historical sketch of the sea urchin fishery.

Chapter 3: The History of Sea Urchin Fishing

3.1 Species Description

The sea urchin is a species that has had a long and prosperous history throughout the world's oceans. It has a track record that speaks for itself. One or more of its nine hundred and fifty species can be found in every ocean on Earth, living in depths ranging from shallow tide pools down as far as five thousand metres deep. Despite a dramatic increase in human harvesting rates over the past several decades or so, sea urchins continue to thrive just as they have done for almost five hundred million years (Hamilton 44).

Perhaps the primary reason for the success of this creature is its unique physiological construction. To look at it, the most striking aspect of the sea urchin is its outer skeletal system that consists of a series of wafer-thin plates that form a globe shape (Hamilton 44). Even more notable than this shell are the hundreds of razor sharp needles, spines or thorns that protrude from the shell in varying lengths, depending on the species. The urchin uses these spines in a number of ways, allowing it to become one of the most durable creatures in our oceans. Different species use the spines for different purposes. In some types of urchin, the spines act as a safe haven for offspring so they can develop in their early stages of life. The young urchin takes refuge within the thorns of the adult urchin as it matures. Others use the spines to bury themselves beneath the sand away from danger. Some species, such as the purple sea urchin of Canada's

west coast, use their spines as a sophisticated jaw-like apparatus known as "Aristotle's lantern" to expand depressions in submerged rocks in order to access potential food sources. As for defense against predators, urchins have the ability to position or point their spines in the direction of oncoming danger (Hamilton 44). As a result of the exterior composition of the sea urchin, it is indeed a formidable foe for many would-be predators.

It is what lies beneath the outer shield, though, which has led humans to count on the sea urchin as a source for food, and therefore to harvest it. Inside the shell of the sea urchin lie five gonads or roe sacks of uniform size, which have been part of the cuisine of seafood eaters for quite a long time. In today's profitable seafood markets, they have become a delicacy of considerable commercial value. The most lucrative of these markets is the Japanese, which will be examined in some detail later in this chapter and in Chapter 6.

3.2 First Evidence of Urchin Fishing

Methods of fishing sea urchins are difficult to decipher from literature prior to the eighteenth century. It is clear, however, that they were eaten. Evidence found in Mesolithic (7000 – 4000 B.C.) refuse heaps have illustrated that sea urchins were part of the diet of the people of that era (Allain 625a). When looking at the writings of Aristotle, it can also be seen quite clearly that sea urchins were included in the diets of coastal peoples. In his Historia Animalium, Aristotle uses

edibility as a factor when deciphering or distinguishing between different types of sea urchins. He writes:

> There are several kinds of sea urchins, one of which is the kind used at the table; this is the one in which the so-called eggs are large and edible, in large and small ones alike: the eggs are present in them even while still quite small. (45)

He mentions another species that was evidently eaten for medicinal purposes, that "lives in the sea several fathoms deep, and some [take] it as a remedy for strangury" (47). Aristotle continues, "The edible ones move about most of all and most often; a proof of this is that they always have something fixed on their spines...They all have Ova, though in some these are very small and inedible" (47).

A few centuries after Aristotle's fourth century B.C. work, Pliny makes a point of describing the Mediterranean sea urchin trade. Its purpose was to cater to the Roman bourgeoisie, who were quite accustomed to this type of seafood (Allain 625a).

On the Breton coast of France, sea urchin remains are regularly found in kitchen refuse heaps dating back as far as the early Neolithic period. One site known as the Moulin de la Rive Kitchen Midden, contains layers of sea urchin tests or shells, as well as limpet and mussel shells, indicating that these were a steady part of the diet around 1000 B.C., during the Iron Age. This site is of further interest as it was, until quite recently, still one of the richest fishing areas in Brittany (Allain 625a).

3.3 Early Fishing Techniques

The time period ranging from those described above, until the eighteenth century, is one for which information on sea urchin fishing is quite sketchy. Up to this point, there is clear evidence of the consumption of urchins. However, we can only assume that they were acquired by handpicking in areas where sea urchins inhabited shallow waters, as there is no evidence of sophisticated equipment or methods that may have been used to fish at greater depths. It is not until writings during the Enlightenment by Duhamel du Monceau, in his two volume Traité général des pêches (General Treatise on Fisheries), that we get our first description of actual fishing methods of the Mediterranean sea urchin fishery. He stated that urchins were harvested either with a "gangui" or a "rake with hooked teeth." A "gangui" is a type of trawl described as "a veritable dragnet...a great destroyer of the fishes". It is not until the very end of the nineteenth century that we get more detailed descriptions (Allain 625a).

3.4 Harvesting Sea Urchins in the 1900s

Methods of fishing sea urchins have varied since the early 1900s as fishing peoples have constantly altered their methods in the search for more effective fishing, while also following new and changing regulations. J. Y. Allain gives a good account of the French sea urchin fishery in the Mediterranean and the gear that was employed. First is the "caouquillet", which consisted mainly of a large mesh net and a beam mounted on an iron barrel hoop. It was used to

gather urchins once fishers had spotted them on the bottom (625b). Also used was a "fer" which was an iron bar half a metre long attached to a semi-circular piece across which a net was stretched. The entire apparatus was towed with a rope. It was used primarily for fishing in seaweed beds (625b). French fishers also used a sea urchin dredge developed from the "fer". On the dredge the iron crosspiece was 1.1 metres long and it had three ropes, with one attached at the top of the semi-circular piece and the others at either end of the crosspiece. This device was used in eelgrass beds (625b).

Other methods used in the Mediterranean until about 1950 included the sea urchin rake, in addition to what was known as the "radasse". The rake resembled a garden rake, and it had a harvesting net mounted on it as it was dragged from a boat. It differed from the "fer" in that it had teeth and was towed by two ropes, one attached at the top and the other at the bottom. In "radasse" fishing, a mass of netting was towed through the water, with the sea urchins becoming entangled in it. The netting would be attached to an iron rod about 1.5 metres long, or when fishing in eelgrass beds, attached to a chain. When urchins were being harvested in rocky areas, the netting would be weighted with a stone of about 2.5 kilograms, to enable the device to sink to the ocean floor (625b).

For the last twenty-five years, France has only allowed two types of gear in the Mediterranean, the "pair trawl" and the "grappe". A pair trawl consists of an iron rod that must be round shaped with a ring at each end. The rod supports

a semi-circular piece of iron that has a third ring attached. A net is mounted onto this frame and towed with rope attached to all three rings. A beam runs across the end of the bag to keep it open during trawling (Allain 626).

The second type of gear in use is the "grappe"; a sort of rake with curved teeth and a wooden handle three or four metres long (Allain 626). It is light enough to be manipulated in the water. Sea urchin fishers relied on this method when pair trawling was illegal, even though it was less profitable. The one advantage of this method is that sea urchins can be taken with little or no damage done to them. This is imperative because breaking of the spines will cause premature death of the sea urchins. Fresh product was and is of utmost importance.

During the 1960s, long handled dip nets were used from small boats, as well as long handled mops, off the coasts of Maine and St. Pierre (Scattergood). The ring on the dip net would be flattened on the bottom and bent in the direction that the net was being pulled. The mop, which would have a stone tied in the centre, was handled like a floor mop, and used to entangle urchins.

3.5 Emergence of the Japanese Market

Up to the 1960s and into the 1970s the sea urchin fisheries met demands in local harvesting areas, as no high level commercial fishery was in place. It was in southern California at this time that a more intense fishery of sorts began. This first intense harvesting began in California, not due to the value or demand

of sea urchin roe, but to protect the kelp forests off the coast of the state. According to case studies on the sea urchin fishery, urchins were once regarded as a nuisance as they fed heavily upon kelp, a marketable species itself. Kelp has long been used as a fertilizer, soil conditioner and growth promoter (TED). In addition to the market value of kelp, it serves an important ecological purpose as well. Strong kelp forests yield shelter and food to various fish species and marine mammals. Thousands of sea birds feed on the kelp. Kelp also serves to protect beaches as it acts as a natural breakwater against strong ocean swells that erode the shoreline (TED).

The entire kelp forest in southern California was in danger in the 1960s as a result of the huge sea urchin population in the region, as kelp forests provide the major food source for most species of sea urchins there. At this point the California Department of Fish and Game and Los Angeles County declared the sea urchin a menace. As a result, numerous divers were hired in 1971 through a federal program to take care of this problem. Kelp companies had sea urchins smashed with hammers and often collected and bulldozed. In addition to this, reefs were often covered in quicklime that would destroy the urchins in more heavily populated areas (TED).

The sea urchin roe market took off in the following years with the increase in strength of the Japanese yen against the U.S. dollar. In addition to the increase in the purchasing power of the yen, the ability of Japanese harvesters to meet the supply demands for one of the country's most sought after seafood

delicacies began to drop. In the period from 1981-1991, harvests in Japan dropped more than 40% from 24,000 metric tonnes to 14,000 metric tonnes per year. As a result, between 1988 and 1993 sea urchin product imports into Japan increased over 65% from 9000 metric tonnes to 15,000 metric tonnes per year. This boom has continued through to the present, making sea urchins the largest export item from the ocean in California, valued at over $75 million USD per year (TED).

During the late 1980s, the sea urchin fishery picked up in Maine on the east coast of the United States primarily out of necessity, as an industry was needed to replace the damaged timber and salmon industries. Luckily for the Maine economy, the most opportune time to harvest sea urchin in the region coincides perfectly with Japanese market demands. The harvesting season in Japan lasts from April until September. However, most urchin roe is consumed in Japan during December and January as part of various seasonal holiday festivals (TED). The first three days of January mark the Japanese New Year, which is seen as the most important holiday on the Japanese calendar. During this time, many foods considered delicacies, including sea urchin roe, are consumed ("Living"). The season in Maine goes from September until March, giving the Japanese a foreign resource to help satiate their peak consumption period. In fact, the sea urchin fishery has surpassed the once unrivalled lobster fishery in the Maine region.

3.6 New Fisheries in Canada

From a Canadian perspective, there has been recent success for fisheries in terms of making inroads into international markets. The number of ocean species harvested in Canada has increased over the last number of years. What was once an industry dominated by cod on the east coast of Canada now includes many once underutilized species such as crab, shrimp, monkfish, lumpfish, and of course, sea urchins. Herring roe is one example of a marketable product that was unheard of until recently. But within the new industry, it has become an important component of the overall value of the fishery ("Creating"). Recent speculation has also hinted toward the development of a kelp harvest on the east coast of Canada, again to support various Asian markets.

These changes in the Canadian fishery can be attributed to several factors. First and foremost, the depletion of once lucrative fisheries, such as cod, has demanded the continuous expansion of potential new markets. Markets all over the globe have opened up recently as a result of advances in communications and technology. The cost of international travel has decreased, allowing Canadian producers and marketers to become aware of the demands of foreign markets while representatives from these markets are becoming knowledgeable of the Canadian supply potential. Also, the ability to conduct monetary transactions internationally has improved while the costs involved have decreased. Perhaps more importantly, and on a practical level, are the

advancements that technology has brought related to processing, freezing, cold storage and transportation, all of which allow Canadian suppliers to meet international demands in a more timely and cost-efficient fashion, while better preserving the quality of the product ("Creating"). Of course, out of this situation has emerged the Japan-Newfoundland connection that is chiefly based on the sea urchin fishery. This relationship will be further discussed in greater detail in Chapter 6.

3.7 Harvesting in Newfoundland Through SCUBA Diving

Sea urchin harvesting began in Newfoundland in the early 1990s on an experimental level, with the overall objective of monitoring the profitability and sustainability of such a fishery.[17] Similar to the case in Maine, the best time for quality harvesting of green sea urchins in Newfoundland's waters coincides with the off-season of the Japanese harvest. The Newfoundland season opens on October 1 in most jurisdictions and continues until the end of April, with the most profitable time coming for harvesters in December and January. The only method of harvesting permitted in Newfoundland is SCUBA diving. Use of pumps and drags have been considered but are currently prohibited.[18] Although the peak harvest season arrives at the optimum time to complement the harvest

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[17] The type of sea urchin harvested in Newfoundland and Labrador is known as the green sea urchin. It is the most abundant species of its type in the Atlantic Ocean, according to the federal Department of Fisheries and Oceans.

[18] A pump would be used to suck sea urchins from the ocean floor using a suction/pump device, from a vessel on the surface. A drag would act similarly to a rake, that would comb the ocean floor for sea urchins.

of the Japanese, there are downsides to the venture of sea urchin fishing in Newfoundland and Labrador. The major disadvantage in the Newfoundland case is that the peak harvesting period often coincides with the period of harshest weather conditions. Because the number of available hours for harvesting is severely diminished due to weather and daylight factors, many fishermen are hesitant to get into the business of sea urchin fishing. Risks are high, both from safety and financial perspectives, while potential rewards are uncertain. In addition, sea urchin harvesting requires a specialized skill, SCUBA diving, that is often outside the realm of the conventional fisher. Despite these obstacles, the fishery is growing.

In the 1940s, Jacques Cousteau and Emile Gagnan developed a portable tank allowing humans to remain under water for extended periods of time. This Self-Contained Underwater Breathing Apparatus (SCUBA) changed the way we approach the sea ("Diving"). With equipment advancements, SCUBA gear has become a staple in sea urchin harvesting all over the world (Gillingham et al. 17). This method has numerous benefits in terms of selection of the most marketable sea urchins as well as environmental protection. Only urchins of desired size are collected and no damage is done to the urchins or to the sea floor (Miller and Bishop 4). If dragging methods were to be used, as they are in scallop harvesting, the sea urchin resource would suffer quickly, as dragging does not discriminate. Countries such as France, who have attempted to base their fishery mainly on dragging, have found out quickly that it is not viable (Gillingham

et al. 17). According to Sea Urchin Video, created by a group of Newfoundland and Labrador divers, it takes three to four years for sea urchins to reach sexual maturity, and seven to ten years before they grow to a width of two inches, the legal harvesting size, therefore making it absolutely necessary for harvesters to be extremely selective with their catches.

This selection process is but one of many concerns of sea urchin harvesters in Newfoundland and Labrador. In order to understand the occupation fully it is first necessary to look at the methods and work techniques that individuals employ on a day-to-day basis as they go about completing their work. These techniques, which will be examined in Chapter 4, range from the simplest and most mundane tasks that become unconscious reflexes, to the more unusual and innovative techniques that set individuals apart from each other, and include all the daily technical performances in between. In the case of sea urchin fishing, as with many manual labour intensive occupations, the majority of these skills are learned on an informal basis, as described by McCarl ("Occupational Folklore" 72). It will be seen that these methods and techniques constitute a specialized body of knowledge that is unique to this occupational group. It is this body of knowledge that plays a huge role in allowing members within the group to identify themselves as members of a group of sea urchin fishers, as will be illustrated in Chapter 5. In addition, it will be argued in Chapter 6 and 7 that the knowledge held by these sea urchin fishers is extremely valuable

and has the potential to create the foundation for a sense of empowerment for this group as a whole.

The information contained in the following chapters results in large part from two sea urchin fishing seasons of informal observations and conversations with a group of sea urchin divers who did their harvesting along the Southern Shore, in Conception Bay and in St. Mary's Bay, all located on the Avalon Peninsula of Newfoundland and Labrador. During these two seasons, in 1997 and 1998 I participated in the harvest, as I had completed training to become a certified SCUBA diver with the intention of participating in this fishery. As a result, I became well versed in the methods, practices and techniques of the industry, and during that time, considered myself a member of a very well-defined group of sea urchin fishers. This kind of participant observation is seen as one of the starting points to any ethnographic research. Insiders gain access to situations that may be hidden to the public, that are not usually accessible to outsiders. It means near total immersion into a culture (Schensul et al. 92). My interest in the topic, as a source of research, came after a partial season working as a sea urchin harvester. At this time, I approached my co-workers, asking if they would mind being informants, and the subject of my thesis. Because of our rapport and bond already established through working together, they readily agreed. Trust had been established and I offered anonymity as a means of protecting their identity in a still experimental and uncertain industry.

The fishing that took place was conducted under the jurisdiction of two separate experimental licenses, granted to George O'Brien and Kevin Burke. The divers who worked under these licenses included the owners, in addition to Shane Wallace, William Wallace and Ron Ford.[19] Urchins were harvested in two separate manners during these seasons. Some diving was conducted from a boat, with a tender aiding the divers beneath.[20] Diving was also conducted on many occasions from a shore-based station, whereby divers would move to a harvesting site near shore, having entered the water from shore. During these two seasons, sea urchins were sold to three separate processing plants. One is located in Trinity Bay, one in Portugal Cove, and the other on Bell Island. Chapter 4 documents the specific practices of these divers on a day-to-day basis as they went about preparing for and completing their work from the point of finding harvestable urchin fishing ground right up to delivering their catch to the processing plant. The tasks require skillful, well-rounded, knowledgeable individuals who are aware of the particulars of the industry in which they are involved.

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[19] The names given are pseudonyms. Those involved in the industry preferred not to be named, as the fishery is not yet established. Issues pertaining to the granting of fulltime licenses versus experimental licenses or permits will be looked at in detail in Chapter 7.

[20] A tender refers to an individual who remains stationed in a boat on the surface, as divers harvest beneath. The tender supplies the divers with necessary equipment and pulls bags of harvested urchins into the boat.

Chapter 4: Methods and Work Technique

4.1 Defining Technique

Each task within an occupation requires a particular skill that must be acquired if the job is to be completed or accomplished successfully. How successful one is in performing a given task becomes the standard against which peer judgment is made. These techniques do not come automatically, and are usually picked up through experience and association with other workers (McCarl 28). The work technique of sea urchin fishers in Newfoundland and Labrador is twofold, as a diver requires specific skills related to SCUBA diving in addition to skills regarding the harvesting of sea urchins. The entire documentation of the work techniques of sea urchin divers in Newfoundland and Labrador comes from participant observations of the divers named at the end of Chapter 3, in conjunction with a publication released by the Department of Fisheries and Oceans through Seabright Corporation Limited entitled Harvesting The Sea Urchin in Newfoundland.

4.2 Preparing for SCUBA

A large part of the canon of work technique of a SCUBA diver revolves around the wearing, preparation and maintenance of diving equipment. This equipment is crucial within the occupation as it literally stands between life and death, as it provides heat protection against the frigid North Atlantic elements

while supplying necessary oxygen for work below the surface of the ocean. It is necessary for a commercial diver to maintain a professional attitude about diving gear. Equipment is usually kept in a convenient carrying box, keeping the numerous items required for SCUBA diving in one place (Seabright 21). Once at the dive site, gear has to be put on correctly in order to work effectively and to avoid problems once under the water. It is also necessary to use high quality equipment to ensure safety and efficiency. This can be quite expensive, as illustrated through various conversations with one sea urchin diver. "A good set of gear can easily cost $3000, and can be as high as $5000 if you want to really go after the good stuff" (S. Wallace).

First, the diver must put on his/her dry suit. Most divers begin harvesting with neoprene dry suits because they tend to be inexpensive when compared to commercial grade shell suits (Seabright 21). A low-cost neoprene dry suit can easily cost between $1000 and $1500. A wet suit is used by some but is viewed as impractical in Newfoundland and Labrador after early autumn, when the North Atlantic becomes icy and the air becomes quite cold. Therefore, most sea urchin divers wear dry suits. It is very important to get this full body suit with boots on and zippered up as quickly as possible in order to avoid getting cold before one even enters the water. This becomes imperative during the winter when the air is frigid. The reality of sea urchin diving is that the suit will not usually be put on until the diver is actually at the dive site. One diver explains how many things would be attempted to avoid facing the cold:

Myself and Shane would sometimes get dressed home in the house if we were diving anywhere handy. This meant driving the truck with the dry suit on. That was awkward, but worth it. Other times we would try to get the gear on while sitting in the cab of the truck if it was really cold out. A couple of times when we were diving from a skiff, we would get dressed in the house of the skiff, with a kerosene heater to keep us warm. (W. Wallace)

More often than not, however, divers would have to dress in the open elements, during the autumn and winter seasons. Most divers use a partner, or a "buddy" system for safety reasons, so each diver will aid his/her partner and quickly zip up the other's suit.

Once the dry suit is on, the diver will next put on his/her hood. As 20% of the body's heat is lost through the head, getting the hood on as quickly as possible is essential. Often, hoods are kept in a supply of hot water, so as to provide instant heat for the head once put on. Next, a full oxygen tank is attached to a buoyancy control device (BCD) or backpack, depending on which the diver is using.[21] A BCD is recommended by diving experts, although many divers option for the backpack, as it is less expensive. Once the tank is secured tightly in place, a regulator is attached to it. The practice of securely attaching a regulator often provides a problem, especially for new divers. William explains:

> When I first started at it, I ruined a couple of o-rings. That is the small piece of rubber that keeps a tight seal between the regulator and the tank. Without the o-ring, the regulator is no good. When adjusting the regulator onto the tank, you have to constantly purge the regulator, before releasing it from the tank. If you don't purge, you blow the o-ring. I ruined a couple like that starting off. You learn in a hurry though when you have to sit around all day and not dive because of a stupid mistake. (W. Wallace)

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[21] For a full glossary of SCUBA diving terms, please see Appendix IV.

Once a tight fit is achieved between the tank and regulator, the tank is turned on and the pressure gauge is checked to make sure the tank is full, as is seen in Figure 4.1. Generally, four or five tanks are used in a harvesting day.[22] The use of tanks identical in size prevents inconvenient backpack adjustments throughout the day (Seabright 21). William relays such an inconvenient experience:

> Shane had a smaller tank that we would use as a last resort at the end of the day if we wanted to get an extra dive in. It would only hold about 2000 lbs. The tank was smaller than the ones we used usually. I strapped it on one day without adjusting my backpack to it. It was fine early on in the dive, but towards the end I felt a strain pulling the regulator from my mouth. I then noticed that the tank was falling off my back and I had to carry it to the surface under my arm. I was lucky the tank didn't pull the regulator right out of my mouth. (W. Wallace)

Figure 4.1: A diver checks his pressure gauge, once his regulator is attached to his tank.

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[22] The average time underwater with each 3000 lb. oxygen tank is approximately one hour, although this fluctuates depending on water depth.

Once the tank is ready, the diver puts on his/her weight belt, which is strapped around the waist, as seen in Figure 4.2 below. The tank must be fully prepared before this happens, because it becomes difficult to move around and make adjustments with approximately forty pounds of lead weight being carried around the waist. When diving in waters where the tide may be strong, divers are often forced to wear extra weight to counter-affect this surge. These extra pounds make it even more problematic for the diver to maneuver before entering the water (Seabright 21). Each diver assists his/her partner in putting on backpacks and tanks. Once the tank is secure on the diver's back, it is tightened in place using straps around the shoulders and waist, as seen in Figure 4.3.

Figure 4.2: A diver straps on his weight belt of approximately 42 lbs.

At this point the diver has the combined weight of the tank and the weight belt to carry. He/she then puts on the remaining equipment, consisting of the mask, gloves/mitts and fins as quickly as possible to prevent exhaustion before he/she even enters the water. The mask is prepared by applying a special lubricant to the inside in order to prevent the mask from steaming or fogging over while under water. Most divers, however, do not use this lubricant, since saliva seems to work just as well. Therefore a diver will spit into the inner section of his/her mask and spread the saliva around this inner surface. Before putting the mask on, the diver will dip the mask in water to rinse off the excess saliva, leaving just a thin, invisible film that prevents the mask from steaming over. The mask is then placed over the eyes and nose, with a strap across the back of the

Figure 4.3: A diver straps on his oxygen tank that is held in place by a backpack.

head to keep it in place. The mask has to be sealed tightly against the face to prevent unwanted water from entering.

Next, the diver puts on his/her mitts or gloves. This can be much more difficult than it sounds and often requires the help of a partner. First, the wrist seals of the dry suit must be folded inward to form a tight seal against the skin. Then, the glove or mitt is pulled on until it fits properly over the wrist seal. Getting the first glove on is usually easy, but the second glove often requires assistance as it becomes awkward to pull on a second glove with one hand already gloved, as the gloves are made of a thick neoprene.

Finally the fins are put on. This piece of equipment is left for last simply because it is too difficult to walk on dry land with them on. The foot is placed into the boot section of the fin and is pushed forward until snug. Then, a strap connected to the fin is placed around the back of the heel to hold the fin properly in place. The straps can be adjusted to give the proper fit. Once this final step is complete, the diver is ready to enter the water. This entry is often not as simple as it may seem. Jumping off a wharf can prove risky, for it is quite easy for a fin or some other piece of equipment to become hooked or snagged while trying to enter the water. Great care and caution has to be taken here, and many divers learn from experience the best ways for water entry. Shane recalls an instance where his fin became hooked in the edge of the wharf, causing him to lose balance and tumble into the water below. Luckily he was unhurt. However he did reevaluate his entry procedure and now only enters the water from a wharf

edge when an assistant is present to aid in balancing, as mobility while wearing the heavy equipment is limited.

During the cold winter months, divers have to be extra careful with regard to their regulators. The frigid air can cause a regulator to freeze open. In this situation, air will flow freely out of a regulator, quickly emptying a tank. At best, this situation will cost a diver a day's pay, as a malfunctioning regulator is simply not reliable. At worst, this could cause an emergency once under the water, as oxygen supply could run out. The best way to keep this from happening is to avoid breathing through the regulator until submerged. Breathing through it while above the surface creates condensation inside the mouthpiece of the regulator that can cause it to freeze in sub zero air temperatures. If freezing does occur, it is often necessary for the diver to have a container of hot water on hand with which he/she can attempt to thaw the frozen regulator (Seabright 21).

4.3 Staying Dry

The maintenance of diving equipment is of utmost importance for anyone who requires it for his/her daily living. In the cold winter months, when most sea urchin harvesting in Newfoundland and Labrador occurs, the major concern is with keeping dry and warm. It is consequently necessary for a diver to keep his/her dry suit "dried out" in preparation for each day's diving. Time is a very important factor here as a diver will often not return home until very late in the evening, usually planning to leave again early in the morning. Yet, during this

overnight window, it is essential to get the suit as dry as possible. There are several methods used by various divers in attaining this goal, often depending on the value of one's suit.

For divers who use newer custom-made suits, problems are rare. Their suits usually fit their bodies quite well and do not leak. Therefore, the suit is only damp from the sweating that tends to happen inside its heavy insulation. This problem is easily rectified by hanging the suit in a heated room overnight. It is usually dry and ready for use again the next morning.

Those who wear non-customized suits, however, often run into major problems with uncomfortably wet dry suits. Wrist and neck seals are often the entrance points for unwelcome water. Because sea urchin harvesting requires extensive use of the hands and arms, it is quite common when using a suit that doesn't fit perfectly to twist and turn the hands and wrists into positions where the wrist seal against the skin is broken. This usually results in an unwanted gush of icy water coming up the arm of a diver. The same happens with an ill-advised twist or turn of the head, resulting in a similar rivulet down the back or chest. This may also happen to divers with custom-made suits, but it is rare. Either way, divers quickly learn the subtleties of their equipment, and adjust their movements accordingly. This may mean simple compromises like turning the entire body towards another diver to communicate, rather than simply turning the head.

turned it inside out and laid it in the bathroom with the heater turned up high. That would be enough to dry it out every night. The smell of the dried neoprene and the heat in the room the next morning was not pleasant though. I did this for the full first season, until the neoprene got so worn out from turning it inside out, that I had to get rid of it. (W. Wallace)

Of course a dry dry suit is usually the determining factor concerning how long a diver is able to stay in the water for each dive, as well as the number of dives he/she can do on a given day. A suit that becomes wet can cause the diver to get cold very quickly, making it nearly impossible to continue harvesting sea urchins. Time literally means money in this business, so methods of drying equipment are very important in the sea urchin diving process.

4.4 Hood and Mitts

The hood and mitts that are worn with a dry suit work in the same manner as a wet suit. They fit tightly against the head and hands respectively, but they do not provide seals against the water. As with a wet suit, they allow an initial amount of cold water to enter against the hands and head. When this happens, it is invigorating if not uncomfortable for the diver. This water is held inside the hood and mitts and is warmed by the body heat coming from the diver's head and hands. Once the water is warmed (this only takes a minute or so) the hood and gloves/mitts are quite comfortable.

The process described in the previous paragraph only works when the hands and head are warm to begin with. As is key with the entire "gearing up" process, keeping the head and hands warm before entering the water is

essential. This can pose a problem as it is impossible to keep the hood and mitts dry. When this equipment is not being worn, the water soaking it becomes quite cold and, in fact, will often freeze. A common technique many divers use involves a thermos bottle or sometimes an insulated cooler filled with hot water. When the gloves and hood are not being worn prior to a dive, they are stored in the hot water. This makes them quite comfortable to put on. A good thermos or insulated box will keep water hot or at least warm for eight to ten hours if the cover is kept on as much as possible. Such a container filled with hot water is a valuable commodity to a diver in the cold winter months and is often one of the first things packed before setting out for a day in the water. William describes his first day:

> The first day I went out, Shane came and picked me up. When I loaded my gear into his truck I saw the beer cooler in the back of the truck. I figured he was bringing a few beers for when the day was over, or had some lunch in it. It wasn't until after our first dive that I saw what was in the box. When we got out of the water, Shane opened the box, and threw his hood and gloves into the hot water that was inside. I did the same of course. There was lots of room in the box for my stuff too. It made a big difference when the time came to put the gear on again. Now, I wouldn't go without taking hot water with me. (W. Wallace)

As with any physically intense occupation, sea urchin fishing requires extensive use of the hands. It therefore becomes very important for a diver to protect or take care of his/her mitts for two reasons. First, if mitts are allowed to wear thin, they lose their insulating capacity and cannot keep the hands warm during a dive. As any sea urchin diver knows, a dive with cold hands is an ineffective dive. Second, the price of replacing damaged gloves/mitts can add up

very quickly as they can cost anywhere from $70 to $150 per pair. For both practical and financial reasons, a diver takes certain measures to protect his/her hand wear. Usually a diver will apply a rubberized cement liquid to the finger and thumb tips of each glove. As it hardens, it forms a protective layer over the glove. Proper distribution of the cement will ensure that the diver loses no flexibility in the gloves, and thus the hands. Of course this cement needs to be applied when the gloves are dry, and it takes several hours to dry properly. Usually a pair of gloves can last for several weeks of intense diving and sea urchin harvesting before the cement needs to be reapplied.

4.5 Dry Suit Repairs and Upkeep

Anyone who has seen, or certainly anyone who has touched a sea urchin, knows that the spines of this creature are razor sharp. Therefore a diver must be very careful once on the sea floor to ensure that he/she does not puncture his/her dry suit, as the needles or thorns from the urchin easily pass through the soft neoprene rubber of a dry suit, causing it to leak. No matter how hard a diver tries, this usually occurs to all urchin divers at some point during a season. In fact it is quite common. William recounts one of his first diving experiences, where he dropped to the ocean floor, landing on a bed of urchins:

> I jumped in and didn't bother to inflate air into my suit to create some buoyancy. Of course I began to sink to the bottom very quickly. It wasn't deep water, so I wasn't worried about it. But when I landed on the bottom I could feel the needles sticking in me. I landed right on top of an urchin bed. It didn't ruin the suit, but it required a little work to fix. (W. Wallace)

When such episodes occur, divers have to continually make minor repairs to the suit to seal the holes, ensuring dry dives. Replacing a dry suit each time it sustains damage is simply not feasible.

To make such repairs, the suit must be inflated. To do so, the suit has to first be laid flat on the floor or ground with the back facing down. The zipper has to be shut, and the wrist and neck seals tied tightly with rope or twine to prevent air from exiting the suit. A regulator is then connected to an oxygen tank with the hose connected to the intake valve, usually located in the chest area of the dry suit. By pressing this valve, the suit will take in air and expand. The suit has to be filled to its maximum capacity, where it resembles an inflated dummy.

Because the hole created from an urchin spine is so small, the diver rarely knows exactly where on the suit the puncture has occurred, although the general area can be ascertained, as that is the place where the body was wettest. Once the suit is filled with air, however, finding the hole becomes easier. It is done using a spray bottle filled with soapy water. The water is sprayed all over the suit from top to bottom and left for ten to fifteen minutes. After this time a mass of soapsuds will become concentrate on the suit in any area from which air is leaking. The person repairing the suit then marks each area that needs to be sealed and the suit is left to dry. Once it is completely dry, special neoprene cement is used to seal the holes caused by the urchin thorns.

Further upkeep is necessary in order to make getting in and out of the dry suit as convenient as possible. Divers have to ensure that the zipper on the suit

opens and closes smoothly. This is a concern as it is usually the buddy of the diver who has to zipper up the suit, quite often while wearing a neoprene glove/mitt. This makes the task difficult, as the buddy's hand does not have a full range of motion inside the glove. In order to allow the zipper to move back and forth with ease, the diver must regularly apply a layer of wax to the heavy teeth of the zipper, as seen in Figure 4.4. The wax acts as a lubricant of sorts. With this in mind a diver usually has a candle or a block of wax in his/her diving box. Even keeping the zipper sufficiently waxed sometimes does not alleviate the problem posed by a stiff zipper. Shane explains:

> One time up in Aquaforte we were ready to do a dive. I had all my gear on and I was trying to get William to close the zipper in the back of my suit. We were outside and it was cold. William's hands were getting too cold to

Figure 4.4: A diver applies a layer of wax to his zipper as a lubricant.

pull my zipper shut because it was too stiff. We managed though. We found a nail drove into a light pole nearby with the head stuck out enough to hook my zipper onto. We managed to get the zipper on over the nail head, and I could throw my weight in order to close the zipper. We had to open it the same way when we got out of the water. It wasn't easy but it worked. The zipper was so tight. I had to wax it up good after that. (S. Wallace)

4.6 Equipment Safety Precaution

Sea urchin diving is an extremely dangerous occupation as the diver literally places his/her life in the hands of the equipment with each and every dive. In addition to the proper assembly and wearing of equipment, the most integral part of the equipment that needs to be checked regularly is the regulator and tank, which act together to transfer air from the tank into the diver's body. This regulator/tank connection has to be inspected before and after each dive. What the diver is looking for in these observations is unwanted air leaks in any part of the connection. This check is completed simply by attaching the regulator to the tank and then turning the air on. By doing this, air is immediately released from the tank and into the hoses of the regulator. If the connection is good and all hoses are properly sealed, there should be no sound of passing air. However, if any air is heard "hissing" from any hose or connection, the regulator needs to be reattached to the tank or repaired. Sometimes, the problem can develop or may not be detected until divers are in the water. Then, bubbles can be seen seeping from the join between the tank and the regulator. It is therefore

important for divers to stay close and continuously observe each other's equipment while in the water.

4.7 Harvesting Techniques

Although the maintenance and wearing of equipment may seem like a job in itself, it is only a small fraction of a diver's daily routine. First and foremost, after preparing equipment, a diver needs to locate an area that has a sufficient quantity of urchins to make a dive feasible. To do this, divers usually use one of two methods. Some will use a viewing glass. This is an apparatus that is handmade by the divers. A hole is cut in the bottom of a long plastic tube with a diameter of approximately ten to twelve inches. A round piece of plate glass or plexi-glass is sealed in place over the hole. The sides of the plastic tube cut down on glare. By placing the glass end of the tube in the water, the sea floor can be seen quite clearly and the diver can peer into the open end of the tube to easily search for urchins. A sketch of a viewing glass can be seen in Figure 4.5.[23]

Secondly, some divers will first snorkel over an area without a tank or weight belt on in order to look for urchins (Seabright 21). Again, in this fashion, the ocean floor can be scoped clearly and extensively. Some divers will even go

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[23] A viewing glass is also used by other types of fishers, as they search the bottom, often for presence of fish species, and often for checking submerged equipment. It is sometimes called a "fish finder". They are also often used to curb sea sickness, by placing the glass underwater and looking through it to reduce the sense of motion.

out before the harvesting season begins and search for suitable dive sites, thus reducing the time wasted in such endeavors once the season begins.

Once the equipment is checked for safety and put on properly, and a harvestable stock of sea urchin is located, the real work begins under the water. On a dive a diver will take two main pieces of equipment. First is a "picker" or a "rake", depending on the make up of the ocean floor. The former is used in situations where the ocean floor is very rocky or any situation where the urchins are difficult to reach. A rake, on the other hand, would be used in any area where the sea floor is primarily covered in sand, and the urchins can be collected with relative ease. Both a "picker" and a "rake" can be seen in Figure 4.6. Both

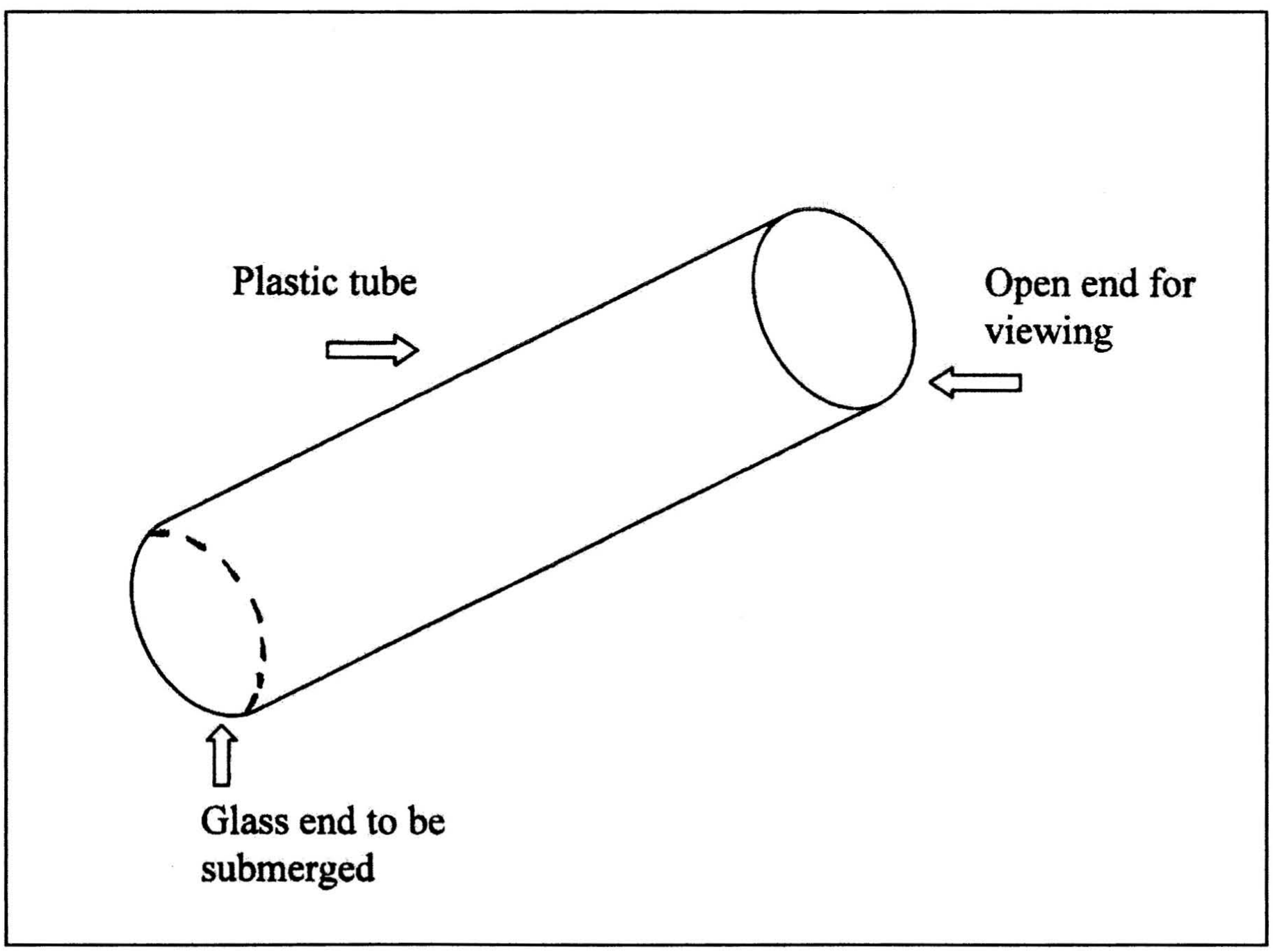

Figure 4.5: A looking glass that is often use by sea urchin divers to locate sea urchins.

tools are usually made from metal. A diver may make his/her own picker or have a welder put one together. As can be seen in the illustration, the tool has a wrist support hoop that makes the tool more effective, preventing it from sliding around in the diver's hand. These collecting methods are the most common. Another effective method which has been used in Newfoundland waters in the past, but is no longer permitted, involves a vacuum pump system with which urchins are sucked through a large hose and pumped into a boat waiting on the surface. This method has both advantages and disadvantages. Urchins which are easily accessible can be collected very quickly, whereas urchins in hard to reach places, such as between large rocks and crevices, are often out of range for this pumping device. Also, at the time of this writing, the cost of such a pumping

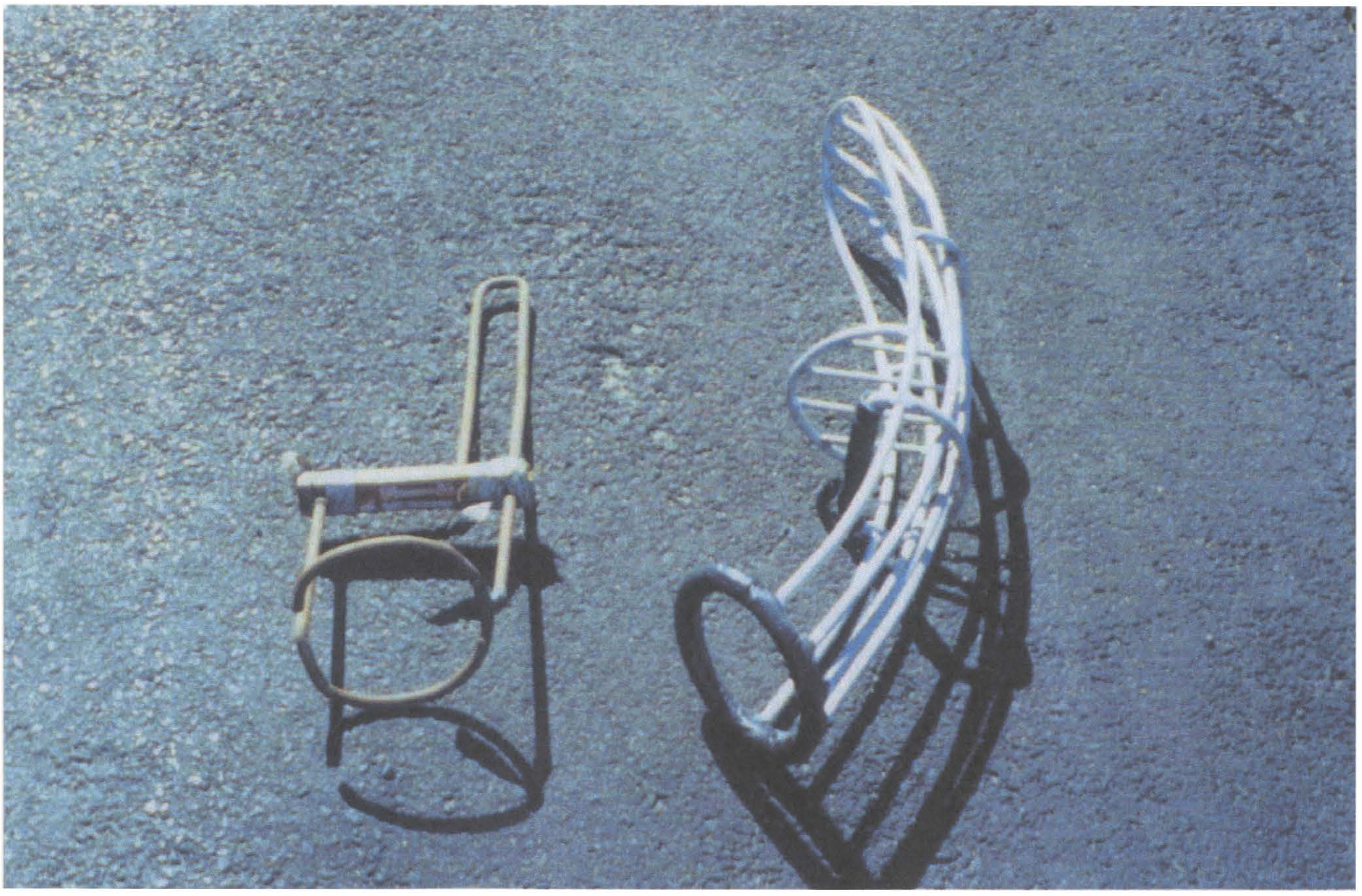

Figure 4.6: A picker (left) and rake (right) as used by sea urchin divers.

apparatus was out of the price range of most divers. This equipment was banned by DFO, as it is difficult to discriminate in terms of the size of urchins being taken with it. Too many undersized urchins were being harvested.

In addition to a collection tool, the second integral piece of equipment needed on a dive is a collection bag. A diver brings as many bags as he/she feels are necessary for the dive, which are to be filled with urchins. An average size bag will usually hold anywhere from thirty to fifty pounds of urchins. The number of bags brought on each dive depends on several factors, such as how many urchins are available, how deep the water is, and how good or experienced the diver is in collecting. The bags are made from a heavy nylon mesh and have two metal rings or semi-hoops at the top, which can be closed to keep urchins

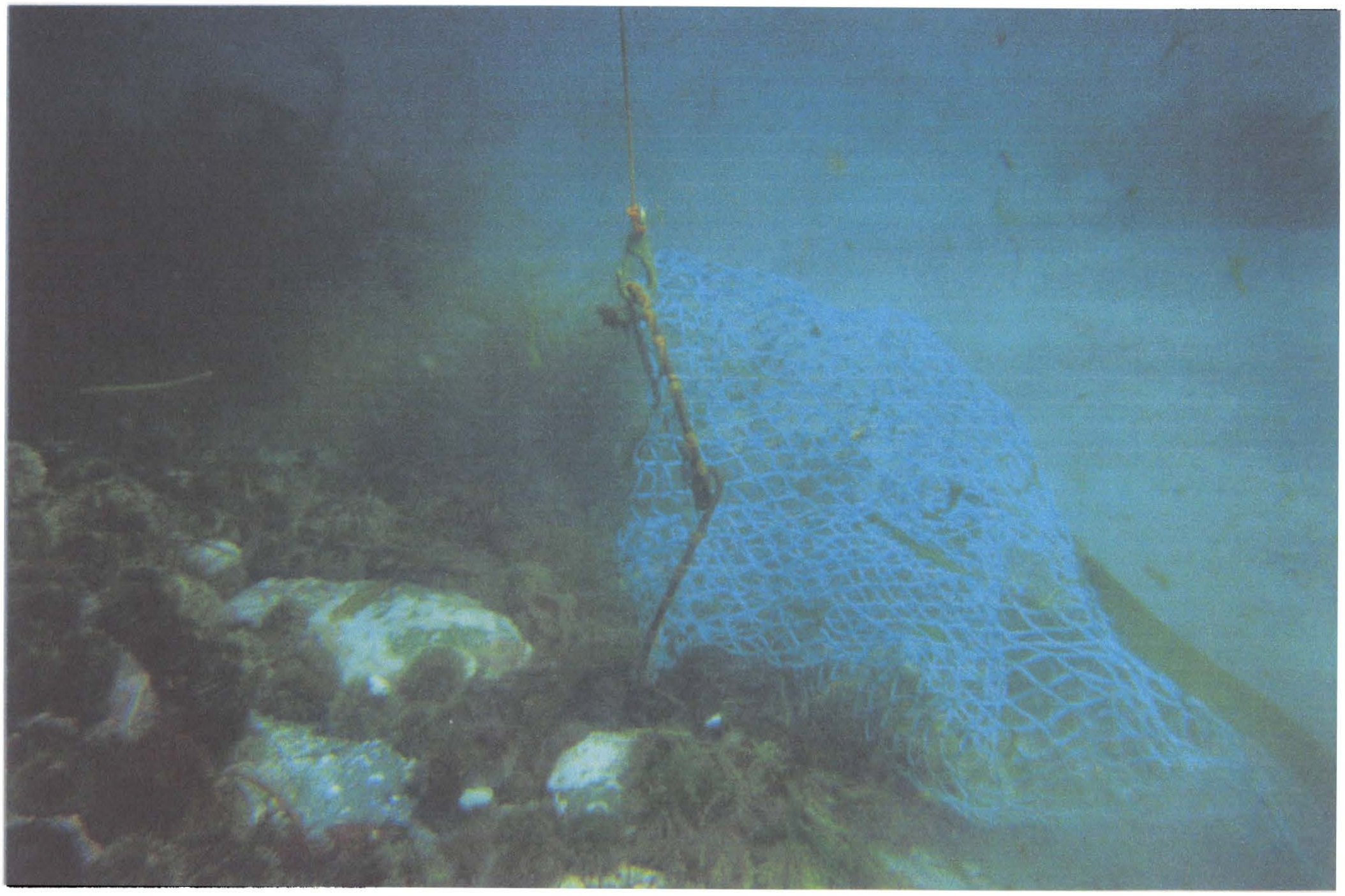

Figure 4.7: A standard mesh bag with wired hoops used for collecting sea urchin.

inside and make the bags easier to handle. An example can be seen in Figure 4.7. Although filling a bag with urchins may seem quite simple, it is a task that takes considerable practice before perfecting. One diver relays his experiences concerning his first efforts in this matter:

> I remember the first time I got in the water and tried to pick. It was over in the Pool in Ferryland. Myself and Shane went over there one evening for about an hour. I was just starting and I wanted to try it out. There was a bit of a tide on that evening so that made it all the more difficult to hold the bag under the water as the heavy mesh really gets carried in the tide. Anyway, there were a few urchins there, but pretty scarce. Picking them wasn't that hard. The only thing was I couldn't keep the bag open and most of the urchins were just missing the bag. It was pretty discouraging to pick for 10-15 minutes or so, and then look at the bag to see it was still almost empty. I just didn't know how to hold the bag open right. (W. Wallace)

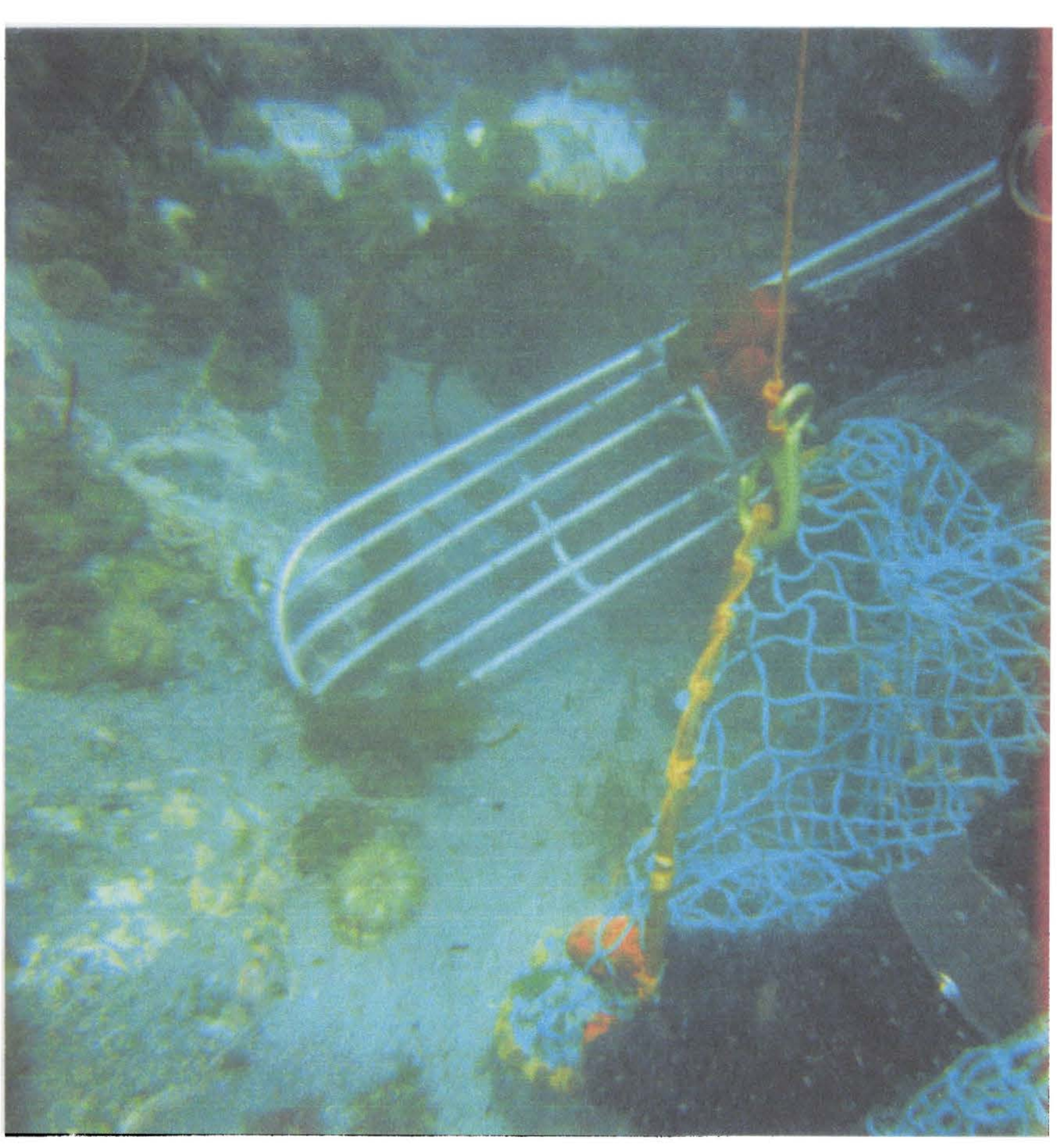

Figure 4.8: The thumb and the forefinger are used to open and close the bag, keeping urchin inside.

Holding the bag open properly is done by using the thumb and a bent index finger, as can be seen in Figure 4.8. With this finger and thumb method, the hoops on top of the bag can be opened and closed quite effectively. For best results the diver will simply close the hoops when moving or not harvesting to ensure that none of the catch escapes. This technique works well until the bag is about half filled and begins to get too heavy to be maneuvered with only the finger and thumb. At this point, a more effective method of harvesting requires holding the bag under the arm, with the arm supporting the bag in a semi-circular type fashion. The hoop on the bag is pressed tightly against the arm, and pressed against the body of the diver supporting the inside of the hoop. Of course, the key in both picking methods is to keep the distance between the person picking and the bag as small as possible.

When filling bags with urchins, the diver must try to get the maximum use out of each bag. This means fitting as many urchins as possible inside. To do this the diver must "shake up" the bag several times in order to get all the urchins to fall deep into the bag in order to make more room. This may seem arbitrary, but the spiny urchins quite often cling onto or get caught up in the sides of the bag and will have to be forced downward. Many divers learn from experience that using the hand to force the urchins into the bags can be ineffective, as it will cause great damage to a diving mitt or glove, not to mention the hand inside.

William learned this from experience:

> The first day I was at it I ruined a pair of gloves. The few urchins I had, I tried to poke them down into the bag with my mitts. That didn't work. I

> drove spines in to the gloves everywhere. I saw Shane then shaking the bag to get the urchins to fall inside. By then it was too late. My gloves were finished. (W. Wallace)

The actual filling of bags with urchins is completed in a systematic and meticulous fashion. Once a bed of urchins is located, similar to the one seen below, in Figure 4.9, the diver covers the area in an effort to take all urchins of suitable size and quality from the bed. The least amount of physical effort required means that a diver will use the minimum amount of air required to cover a bed. This is of utmost importance, as it allows for more bottom time, enabling the diver to get more work done. Therefore, a diver will normally zigzag his/her way through an urchin bed, covering the entire area and using the rake or pick to collect urchins into the bags as seen in Figure 4.10.

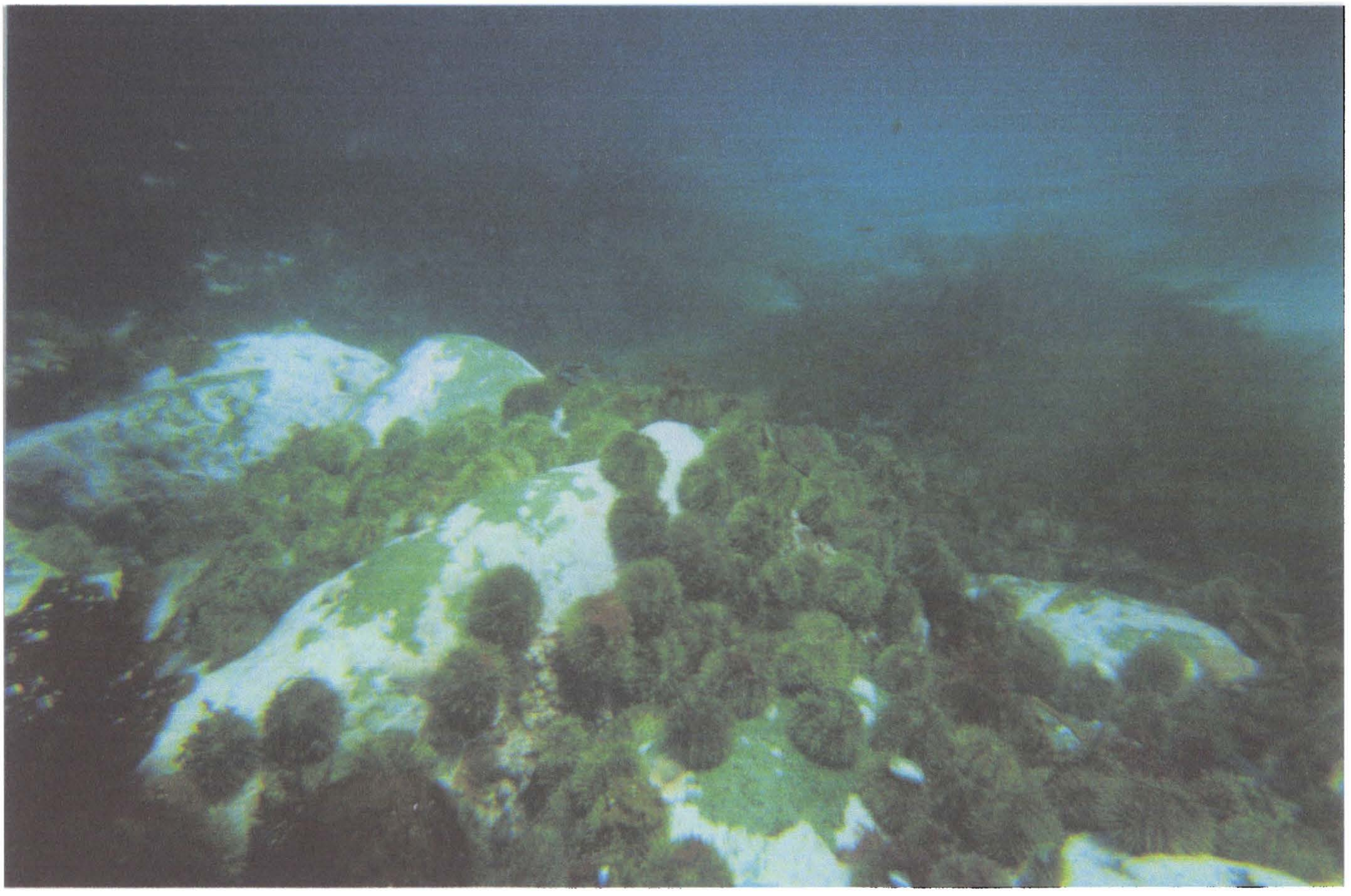

Figure 4.9: A bed of sea urchin feeding on kelp and seaweed on a rock bottom.

4.8 Landing the Catch

Once the bags are filled or a diver is nearing the end of his/her oxygen supply, whichever comes first, the next task is to get the bags of urchins to shore. The method used at this point depends on whether the divers are harvesting from a boat or from the land. If they are using a vessel, the method of getting urchins aboard is relatively easy. A tender, as the person is known, awaits in the vessel on the surface and pulls filled bags of urchins in with a hook attached to a

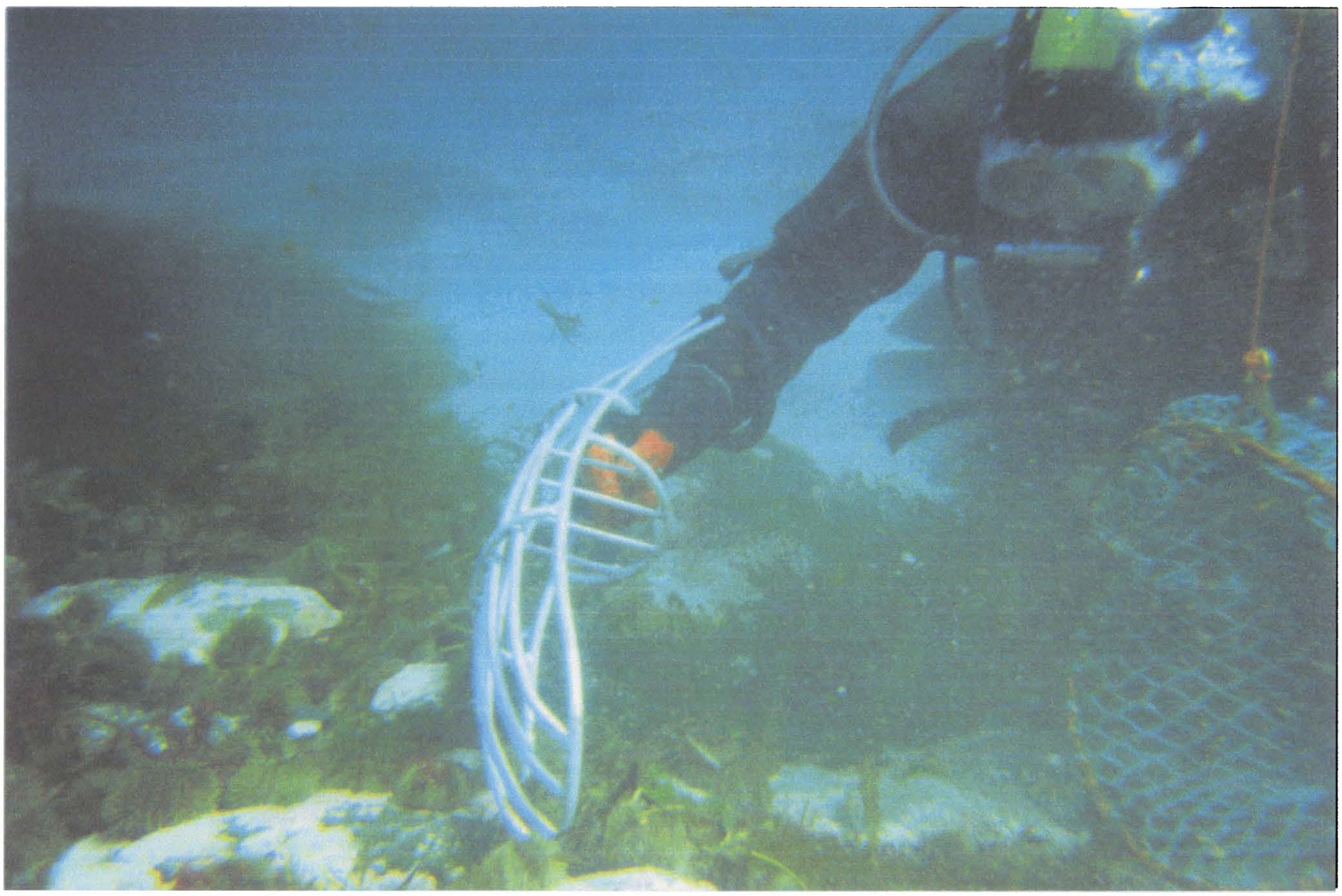

Figure 4.10: Using a rake to collect sea urchins into a mesh bag.

rope, as the diver hooks the bags on below.[24] This is much easier than pulling from land as bags can be taken up as soon as they are filled, most often from a distance of fifteen to twenty five feet below the surface to a maximum of fifty to sixty feet below.

From land, however, the task can be quite tedious. When divers are harvesting close to shore it is convenient and practical to have an assistant on shore to pull in bags as often as possible during a dive. When a diver is within fifty feet of shore, an attendant can easily pull in bags and throw the rope back within the vicinity of the divers with regularity, lessening the number of bags that need to be brought in at the end of the dive, while maximizing bottom time for the divers. Ideally, divers want to spend as much time as possible harvesting sea urchins, and as little bottom time as possible completing other tasks involved with landing the bags filled with urchins.

If divers are harvesting without the use of a boat and are at a distance of more than fifty feet from shore, landing catch becomes extremely difficult. At this distance an attendant on shore can provide little help, as he/she is unable to throw a rope to the diving area. Assistants on shore operate by throwing a rope with a hook or fastener attached to the end to the vicinity of the divers. The divers then take the rope and attach filled bags of urchin to it for the assistant on shore to pull in. Distances more than fifty feet make throwing the rope to the

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[24] A tender is essentially the individual who drives the boat for the divers. He/she stays in the vicinity of the divers at all times. In addition to controlling the boat, the tender most often will pull filled bags of urchins into the boat, sending empty bags back down to the divers below. Tenders can begin culling through the urchins taken into the boat, as divers continue to harvest below.

divers accurately and with consistency very difficult. Also, at such a distance, divers cannot swim back and forth with individual bags as it wastes too much air.

In this case the divers have to get the catch to shore themselves, near the end of the dive. They do this using a long piece of rope as well as what is known as a lift bag; as William explains:

> Myself and Shane would usually dive without anyone hauling bags for us, especially when we were in Witless Bay. The urchins were good there and plentiful, but we usually had to go over two hundred feet from shore to get them. It was hard work getting them in. Usually we would dive in and carry a lot of gear out to the site with us. We would take about fifteen bags, a lift bag, and about three hundred feet of rope, plus our pickers out between us. We would tie one end of the rope onto the wharf where we got in. That's a lot of gear and it was a long haul out to the site. Usually, we would each burn about five hundred pounds of air before we even had an urchin. Once we got out there we would just lay all the gear in the middle of the bed of urchins and start picking. The urchins were good size there with good yield. Otherwise, it would never have been worth our while to be at it there. I would pick until I got down to around five hundred to seven hundred pounds of air left. Then I would head in. Although I think my picking was faster, I wasn't as experienced as Shane as a diver, and he was able to stay down longer than me by lowering his air consumption. So if I had five hundred pounds left, he usually had around eight hundred to a thousand pounds left. Heading back to shore was much easier than going out as I had no gear to lug in. So I would usually get to shore with a couple of hundred pounds of air to spare. Once on shore however, this was when the hard work would begin for me. Before I would begin hauling, Shane would work on tying all the bags together and attaching them to the rope. He would then fill the lift bag with air using his regulator. He would just take the regulator out of his mouth, and release some air from it into the bag. The lift bag would be attached to the bags of urchins. As the lift bag is filled with air it begins to head for the surface lifting the bags of urchins off the ocean floor. Once he had the lift bag attached, Shane would come to the surface and signal to me that is was ready to pull. By this time I would usually have the weight belt, fins, mask and tank taken off. Fifteen bags of urchins would usually weigh over a thousand pounds. I would pull them hand over hand for about two hundred feet, right into the base of the wharf where we had started. Getting them to start moving was the hardest. Once I had them moving I would struggle to keep them as my hands and arms would burn from the

> strain. Shane would follow along with the bags, sometimes on the surface if he was short of air, just to make sure they didn't get hooked in any rocks or something on the bottom. Once I had them into the base of the wharf, they had to be pulled up onto the wharf. Shane would unhook them and reattach them two by two until I had them all pulled up onto the wharf. (W. Wallace)

Pulling urchins from a long distance as in the situation described is only practical in areas where urchins are of good quality and quantity. Divers lose out on bottom time in this situation, which cuts into the catch. But on the positive side, they save the cost of paying an assistant to stand on shore and pull in bags.[25]

4.9 The Cull and Transporting of Urchins

After divers have landed their catch they face the task of culling their urchins before they transport them to the processing plant. Some sort of culling table is needed. The type of table used depends on where the cull is taking place. If urchins are to be culled in a common area, then a table constructed for that purpose might be used. This is usually a makeshift device, perhaps made from the cover of an insulated gray fish box, or the tailgate of a pickup truck. Bag by bag the urchins are dumped onto the table and sorted according to size. The minimum width of an urchin permitted to be harvested is 1 7/8 inches. Anything smaller than this is not to be taken from the water. Quite often though, divers inadvertently take smaller urchins, as objects viewed underwater appear to be twenty five percent larger than their actual size, and have to return them to the

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[25] Usually each diver pays an assistant on shore fifty dollars per day.

sea after this sorting process. Divers who are culling for the first time use a measuring stick that shows the size limit, so undersized urchins are not kept. However, after some practice, the size restrictions can be observed simply from sight. Measuring is not required. Also, with experience, divers learn to keep the number of undersized urchins taken to a minimum.

The urchins that are kept for processing are held in fish/crab pans. These containers are also known as totes. Each pan/tote will hold anywhere from sixty to seventy pounds. Of course, a truck or trailer of some sort is necessary to move the urchins from the dive site to the place of processing. Quite often, one pickup truck is not enough. As Shane says, "We needed two trucks...one for urchins and one for gear."[26] This is one of many characteristics that separate the sea urchin fishery from the more traditional fisheries of Newfoundland and Labrador. Sea urchin fishing is, in the truest sense of the word migratory, in that fishers are constantly moving from one site to another to harvest sea urchins. This often means traveling from harbour to harbour, bay to bay, or community to community. Unlike those who fish or have fished for cod, crab, lobster, and the like, the sea urchin fisher does not have a base from which he/she operates. Therefore, there is no fishing stage or storage shed where equipment can be stored on a regular basis, as no port or station is used with any regularity. All

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[26] The amount of equipment that has to be transported from site to site is great. Two divers would need to carry two diving equipment boxes, containing all the SCUBA gear for each diver. Eight to ten oxygen tanks would usually be carried for one day of diving. An insulated cooler box filled with hot water is often needed. Rakes or picks are taken for harvesting. As many as twenty harvesting bags are taken, in addition to rope, lift bags and floats.

equipment must be carried from site to site if the sea urchin fishers are to carry out their work effectively and efficiently.

Because the sea urchin fishery is an underutilized species fishery, employing small numbers of fishers, the supply of urchins to processing plants is relatively small. Therefore, processing plants will rarely send out trucks to pick up catches. Even when trucks are sent out, they will usually not come to the harvesting site. Often, they will meet divers at some rendezvous point, where the urchins are transferred from the diver's truck onto the processor's truck. This is not a simple or convenient process. First, there are only about three or four processing plants in the province that operate on any sort of regular basis. Second, the ones that do pick up urchins will often only do so once or twice per week. Therefore, divers are often left trying to store or hold urchins themselves while waiting for a time when it is convenient for the processors to pick up the catch. This creates a problem for divers, as temperature control is essential in order to keep sea urchins fresh once they have been extracted from the water.

It is imperative in sea urchin processing that the catch remains living right up to the point when the shells are broken open and the roe or spawn inside is extracted. Under optimum conditions, urchins will survive three to four days once taken out of the water. This is only made possible by keeping a stable air temperature of about -1°C around the stored urchins. During most of the urchin season it is difficult to keep a stable air temperature. In the autumn months of October and November the air temperature is often too warm, causing urchins to

"spawn out" prematurely if left in the warm air.[27] Therefore, in order to avoid this and because air temperatures fluctuate and are unpredictable, divers will often keep the urchins inside the harvesting bags and leave them in the water until it is time to go directly to the processors. When doing this, a sheltered area has to be found. If the urchins are left in the water in a location where the tide is heavy, the bags of urchins will roll in the tide, often killing them. If the thorns break off the urchins, which is prone to happen in the described situation, the urchins will also die. Shane explains a situation where this happened:

> We left eight or ten bags of urchins in the water one night down over the wharf in Ferryland. It didn't seem like a bad night, but when we went back the next morning all the urchins were dead. The spines were broke off and they were turning gray. They had rolled around all night in the tide. After that we had to find a better place to keep them. (S. Wallace)

Therefore, during the early months of the season, divers who do not have access to a cold storage facility are forced to find a suitable place where urchins can be kept in the water.

During the winter months of the season, however, the opposite is the case, as divers have to be concerned with their catch becoming frozen in the frigid winter air. Again during this period, it is often best to leave the urchins in the water until the last possible minute. However this is often not possible, especially in instances where divers are harvesting in a location that is inconvenient for storage purposes. In such instances, divers will often go to great lengths to salvage their catch, as in the following recollection:

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[27] "Spawn out" essentially means that the urchin will naturally spawn through its back, leaving the creature virtually useless to processors or markets.

I remember one night in January and we had about 1300 –1400 pounds of urchins out in the shed. We were going to meet the plant's truck that night at 3:00 am when they were on their way to the airport. We were selling to them then out in Trinity Bay. It was freezing hard that night, about -10°C I'd say. The urchins had been out of the water since four o'clock that evening. Anyway, we had them out in the shed with the wood stove going and the urchins wrapped in tarp in the fish pans. We had a thermometer under the tarp and we spent the whole night running back and forth to the shed trying to keep the temperature around -1°C or so. We would rotate the pans, move them away from the heat, close to the heat, take off the tarp, put it back on. It was a racket. You wouldn't spend so much time looking after a youngster. And in the end, we didn't get anything for them. About $1,000 worth of urchins spoiled. (W. Wallace)

As is reflected in this chapter, the work of the sea urchin diver is extensive, exhaustive and extremely dangerous. Divers work long hours when they have a day that has suitable weather and diving conditions. Divers often go through five oxygen tanks each in one day. Their work is labour intensive, as divers have to transport urchins in bulk from the sea floor in large nylon mesh bags to the surface. This has to be carried out while wearing extremely heavy diving equipment that impedes the body's range of motion. From here, the urchins have to be taken to the point of processing in bulk, in transporting pans or totes. This means carrying these sixty to seventy pound pans of sea urchins from the point of landing to a truck or trailer for moving. Despite the long, difficult hours, safety needs to remain paramount when partaking in multiple dives in one day, with divers paying particular close attention to bottom time.[28]

The canon of work technique that allows divers to carry out such work is learned from diver to diver, and through the process of trial and error. Through

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[28] The importance of bottom time will be discussed in detail in Chapter 5.

these processes, a diver gains a very specific body of knowledge that allows him/her to partake in the occupation of sea urchin harvesting. This body of knowledge does more than simply allow divers to operate within their occupation. The knowledge that is gained is also invaluable in terms of its potential to aid in the management of the sea urchin fishery, as will be discussed in Chapters 5, 6 and 7. As a result, those involved in the industry develop identity and become empowered.

Chapter 5: Identity and Empowerment

5.1 Part of a Group

Studying folklore texts in and of themselves can be problematic, as outlined by Neil Rosenberg in "Folklore in Atlantic Canada: The Enigmatic Symbol." Rosenberg examines collections of "Newfie" jokes, which do little but perpetuate insulting stereotypes. He states that collecting such texts simply for the purpose of documenting accomplishes very little as a folkloric study. He argues that the only way to justify such collections is to examine the entire dynamic surrounding the stereotyping process in its social context (79). This call for a full contextual study is taken further by Barre Toelken, in The Dynamics of Folklore, who states that any study of folklore or a folk group, "must take into consideration the multiple and complex interactions that occur among members of a close group, whenever a traditional performance of any kind takes place" (55). Noting these interactions requires observing the entire context in which such a performance takes place. This context may include such things as the weather, the time of year, the narratives, past experiences or a particular activity that is taking place or being carried out by the group. Toelken further argues that "no text can be fully understood without considerable reference to the dynamics of its context, the total live situation, in which it came forth" (56). This is important for understanding how sea urchin fishers achieve a sense of identity.

Other factors unite these fishers, aside from the canon of work technique discussed in Chapter 4.

At the heart of a contextual study are the individuals that comprise the group in question. A clarification as to what makes such a folk group is necessary for this discussion to proceed. Folklorists in the nineteenth century automatically equated folk groups with peasants, thus limiting the range of individuals, groups, regions, texts, performances and oral traditions worthy of study. Sophisticated networks outside of the so-called "backwards classes" would be overlooked when considering only this antiquated definition. In the "Preface" to International Folkloristics, Alan Dundes has offered a much broader definition, defining a folk group as, "any group of people whatsoever who share at least one common linking factor" (vii). He asserts that the actual linking factor is of little importance. It may be related to place of origin, place of work or occupation, religious affiliation, or family connections. Folk groups can be as large as a country and as small as a family group, and individuals may belong to multiple folk groups (vii).[29] Although this definition is rather broad, it is perhaps the most widely accepted in folkloristics.

Of course there are more detailed and specific definitions of what constitutes a folk group. In the introduction to the Handbook of American Folklore, W. Edson Richmond identifies a folk group as follows:

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[29] Elliott Oring, in "Dyadic Traditions", has gone so far as to suggest that a folk group may consist of a number of members as small as two, referred to as a dyad (19).

> The group are dwellers in a particular geographic area, or they are committed to a special way of life – nomadic or static – or occupation – farming, fishing, millworking, teaching, healing, et al. – or they share an interest in a special ritual – religion, fraternal organization – or avocation – model building, collecting, jogging. Out of such interests and situations grows their folklore, which then serves to emphasize the relationships of each individual member of the group to each other…it is a means of identification. (xii)

This definition suits the purposes of this study as it identifies specific occupational groups, in particular that of fishers. More importantly, this explanation emphasizes the connectedness between group members, and the sense of identity that results from this shared way of life.

A sea urchin harvester, as a result of the duties of the occupation, belongs to a distinct group within the larger occupational group of commercial SCUBA divers.[30] A harvester, therefore, has to absorb a body of knowledge associated with both which must be combined in order to achieve the goals of the occupation effectively. First and foremost, an urchin harvester belongs to a group of commercial divers who use the appropriate equipment to work below the water surface on a regular basis to earn a living, as was discussed in Chapter 4. Also among this group are underwater welders, labourers, researchers and aquaculture workers. The urchin harvester draws his/her identity from both the larger group and the sub-group, and the knowledge that he/she has attained from being a member of each.

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[30] Sea urchin harvesters, it could be argued, also belong to a larger group of fishers, but an analysis of their connection to this group is beyond the scope of this study.

5.2 Safety as a Unifying Force

As Alan Dundes writes in "Defining Identity Through Folklore," "any identity system is dependent on an individual's belief in his personal affiliation with certain symbols and with their meanings." There is a common set of traditions or customs each member of the group relates to in a manner that sets them apart from other groups (150). Among these are the narrative traditions of the group. Sea urchin fishers, as well as all commercial SCUBA divers in general, focus on safety as an integral part of successful sub-aqua employment.

What is learned in training courses is essential to safe SCUBA diving. It is here that divers are instructed on the importance of safe and reliable diving equipment, the use of that equipment, the buddy system, proper diving communications, dive planning, boat-diving strategies, the importance of surface intervals, bottom time and how to calculate sufficient surface intervals (PADI v).[31] In addition to what is learned in training programs and through experience, many divers become aware of the possible dangers of the job by passing on stories of the mishaps of others, which are attained mainly through oral means, as divers discuss among themselves the practices and hardships of other divers. These stories are often told among divers seemingly as simple, interesting or unfortunate stories. However these stories serve an underlying purpose, as suggested by Barre Toelken in The Dynamics of Folklore. Toelken, in discussing

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[31] Surface intervals are very important in order to avoid decompression sickness, or "the bends." This occurs when nitrogen from breathing air dissolves into the body tissue. If a diver remains underwater too long, the excess nitrogen will form bubbles in the blood vessels and body tissue when the diver ascends, causing a serious medical condition (PADI 192).

humour in dangerous settings of loggers as a folk group, states that humourous stories, pranks or jokes act as a way of mitigating the fears and anxieties of those in the occupation who are afraid to openly discuss or air their own apprehensions or nervousness about the occupation (66). Although the stories and episodes discussed here, which are either nationally media covered events or informal stories relayed by my informants, do not reflect humour of any sort, they achieve the same purpose. They promote awareness among divers as to the risks, hazards and dangers of the job. Fortunately for divers, these mishaps are rare, as reflected in the fact that reports come from within a wide geographic range. Most divers would admit that they would much rather not hear of these instances which are often tragic; however, these narratives, and the dangers described therein, are part of the occupation. They do serve a purpose as they remind divers to take as many precautions as possible.

Robert McCarl notes the difficulties of the folklorist in recording how workers within a specific group deal with hazards or dangers on the job in "Accident Narratives: Self Protection in the Workplace." He says:

> It is difficult for the folklorist to truly capture the feelings of workers who face danger everyday on the job, and who communicate in the natural context of the lunch room or during the work break the insider's view of not only what the real dangers are, but how the individual responds to (and ultimately) anticipates and avoids the recurrent exposure of the trade. (35)

This insider-outsider obstacle has been overcome in this study as I considered myself a member of the group of sea urchin divers, having travelled, worked, and

dived with them for two fishing seasons, and having in fact taken part in the tradition of narrative exchange.

The following narratives function in a similar manner to the rituals and practices of fishermen in a southern New England town, as discussed by John J. Poggie Jr. and Carl Gersuny in "Risk and Ritual: An Interpretation of Fishermen's Folklore in a New England Community." Their discussion focuses in large part on the beliefs of fishermen, such as not bringing a woman on a trip or not shaving on a trip (141). These beliefs function as reminders to adhere to particular behaviours, much in the same way as divers' narratives remind divers to act in a cautious manner. They help those involved to cope with the potentially hazardous environment in which they are operating (144).

A number of danger-related narratives circulated amongst the men with whom I dove for urchin. Because of the essential nature of properly maintained and functioning equipment, it should not be surprising to note that safety narratives often focused on malfunctioning equipment. Two of the following instances involve the use of a surface supply air system, or as it is sometimes called, hookah system. With this apparatus a diver breathes through a hose that is connected to an air compressor on the surface, most often located in a boat. The advantage of such equipment is that the diver is free of the extra weight of carrying an oxygen tank on his/her back. There is also an unlimited supply of air with surface supply whereas most tanks provide approximately 3000 lbs. of compressed air, which is usually enough for less than one hour in the water,

depending on the depth.[32] The drawback of using surface supply is that the diver has no close proximity to the oxygen supply, which is in effect his/her lifeline. This can prove to be toxic, as is seen in the case of Glenn Dennis, a sea urchin diver from British Columbia who got carbon monoxide poisoning while harvesting. His surface supply intake hose had a crack in it, allowing exhaust from his Honda motor powered air compressor to enter his oxygen line. He passed out, barely reaching the surface safely ("Harvest" D1).

Another diver by the name of Kevin Lee Bablity, also of British Columbia, was not so lucky. Just days after dropping out of a commercial dive course, he drowned when he jumped in the water, not knowing that his air supply was shut off ("Harvest" D1). These cases, initially documented in the media, have become part of the narrative tradition of SCUBA divers. These stories resurface again and again, and certainly any time the subject of surface air supply is raised. Another potential hazard of the surface supply system is described by Newfoundland harvester William. "I've tried it and I don't like it. I spent most of the dive untangling the hose. It was usually around the prop of the boat."[33]

Dealing with the boat on the surface, and the tender in the boat, can prove hazardous as well. The following narrative, recounted by Shane, tells the story of a former colleague of his:

> A buddy of mine nearly got it once because of an inexperienced tender. He came to the surface to board the boat. The tender didn't see him, and

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[32] The depth affects the length of air supply as oxygen becomes more compressed as depth increases. As the air becomes more compressed, less is available.
[33] Prop refers to the propeller of the boat which is extremely sharp, and can easily cut through an air supply hose.

> the boat was coming toward him in reverse, with the prop engaged. Gary put up his arm to protect his face. The prop grabbed the neoprene of his suit under his arm and it began to wrap around the prop. Luckily, the neoprene was so heavy that it drowned out the motor and no damage was done. But the tender never saw him. (S. Wallace)

As stated in Lake Erie Fishermen, one of the primary tasks of all commercial fishermen is to minimize the amount of expense and effort needed to catch the maximum amount of fish (Lloyd and Mullen 2). In sea urchin harvesting, this means getting the most out of each dive. Time is literally money. Of course this can be extremely dangerous as divers are often tempted to stay that extra minute or so to the point where their air supply is depleted. A diver by the name of Gerald Cletus Boucher of British Columbia died while harvesting sea cucumbers. He ran out of air on a final dive while trying to untangle a net. He was unable to free his two weight belts as the buckles had slipped behind his back. He never reached the surface ("Harvest" D1).

Divers remind each other of their own mishaps or mistakes on a regular basis, often in jest, but also as a reminder as to potential problems. One diver recalls the encounter a fellow diver had while filming a video on sea urchin fishing for the Department of Fisheries and Oceans:

> This was funny mainly because it was all on the video. George and Mark were doing this video for Fisheries and Oceans. George was pointing out the different types of feed and Mark was videotaping. George was scrambling here and there, not realizing that he was running out of air. Then you could just see it in his eyes that he had no air left. His eyes opened up real wide as he was looking at Mark and pointing at his

> regulator. The tape ended right there, and Mark went over to him and gave him his safe second.[34] They both came to the top that way. George was so busy making the video he never bothered to look at his gauges. (K. Burke)

Another episode is recounted whereby a diver entered the water, not having secured his equipment properly, providing for an unsettling event for that diver, as retold by Shane:

> I jumped in and was waiting on the bottom for William. When he came to the bottom, I could see his eyes were wide open. He didn't have the regulator in his mouth. He bolted to the surface and put the regulator in. It had been there all along beside him. He just panicked and went to the surface. All he had to do was put it in his mouth. (S. Wallace)

These stories constantly resurface among the studied group of divers, as safety is paramount to successfully completing the job. In "Characteristics of Occupational Narratives," Jack Santino discusses cautionary tales, which act in the same manner as the biblical parable in that they teach. These tales suggest a system whereby the cause of the accident can be determined, and if the proper procedures are followed, the accident can be avoided in the future (202). In all cases, the causes of the accidents can be equated to one of two things. Mishaps occur either as a result of human error or as a result of equipment malfunction. These stories suggest that a diver has to be mentally aware at all times, not only of his/her surroundings, but also of the proper use of his/her equipment. In addition, constant checks and tests are necessary in order to ensure that equipment is always ready and safe for use, and is in proper working condition.

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[34] A safe second refers to a second regulator attached to the oxygen tank of a diver which may be used in the event of the failure of the first regulator, or to aid a partner or buddy diver.

Stories or tales analyzed by Santino suggest that there are dangers in trying to do too much work, as well as in being careless or reckless (202-03).

Robert McCarl, in his "Accident Narratives: Self Protection in the Workplace," looks at narratives that come from the collective experiences of workers in various occupations that deal with injury, near-Injury and death. McCarl explores the function of such narratives:

> The accident and the accident narrative force this dialogue into a worker's consciousness by first drawing attention to the specific technique involved and then verbally framing this technique in a story which reveals something about how this aspect of the job is anticipated. If work technique, the actions and rhythms of accomplishing work based on an inherited body of technical and social expectations, lies at the heart of occupational culture, then accident accounts provide ... insights into the culture's response to past violations of these expectations. (36)

As McCarl suggests, once an episode enters the narrative tradition of the group, it becomes etched into its body of knowledge. The recurrence of these stories, in addition to the contexts in which they are told, suggests that these cautionary tales are as important to the group as any knowledge of diving equipment or harvesting techniques. In fact, McCarl suggests that knowledge gained through such traditions acts as, "new information that a worker can add to his repertoire in the work context that aids him in avoiding potential mistakes" (37).

These narratives also function to empower the divers in that they can be reassured that by following the advice of such stories, they can guarantee a certain informal control over workplace safety. The dangerous environment in which divers work represents a constant threat, and the resultant narratives reflect both proper and improper ways to deal with these threats. The

information gained through the narratives becomes "artistically framed," according to McCarl (41). Although the outcome in some narratives is disastrous and unnerving, divers realize that by acting accordingly, they can and will avoid such encounters.

5.3 Shared Knowledge of a Group

In addition to being members of a group of sea urchin divers, or on a larger scale, a group of divers in general, sea urchin fishers are also part of a more specific group who shares a wealth of information on the sea urchin fishing industry. This shared information involves where to find sea urchins, how to determine the marketability of sea urchins, and the most efficient method of harvesting sea urchins.

In It's a Working Man's Town, Thomas W. Dunk uses the writings of Stan Gray in exploring the attitudes workers have towards their own body of knowledge on their occupation. Gray's words fit the attitudes of sea urchin fishers well:

> The workingmen contrast themselves to other classes and take pride in having a concrete grasp of the physical world around them. The big shots can talk fancy and manipulate words, flout their elegance and manners. But we control the nuts and bolts of production, have our hands on the machines, gears and valves, the wires and lathes and pumps, the furnaces and spindles and batteries. We're the masters of the real and the concrete: we manipulate the steel and the lead, the wood, oil and aluminum. What we know is genuine, the real and specific world of daily life. Workers are the wheels that make a society go round, the creators of social value and wealth. There would be no fancy society, no civilized conditions if it were not for our labour.

> The male workers are contemptuous of the mild-mannered parasites and soft-spoken vultures who live off our daily sweat: the managers and directors, the judges and entertainers, the lawyers, the coupon clippers, the administrators, the insurance brokers, the legislators ... all those who profit from the shop floor, who build careers for themselves with the wealth we create. All that social overhead depends upon our mechanical skills, our concrete knowledge, our calloused hands, our technical ingenuity, our strained muscles and backs. (225-6)

Dunk further argues that it is a detailed knowledge of a process or a piece of equipment or a job site that allows workers to get things done. Although this knowledge is not often recognized by people in positions of power or authority, it is this knowledge that the workers within an industry see as separating them into distinct groups (144). Sea urchin fishermen realize that they are the experts in their field and no one else possesses the knowledge or the skills to carry out their work effectively. As Shane points out:

> Nobody knows what is going on in this fishery, only us. Fisheries officers have come up to us and asked us what we were doing. They didn't know. They don't know what you're allowed to take, how much you can take, or sometimes even what you are taking. The divers are the only ones who know how this whole thing operates. (S. Wallace)

This notion laid out by Dunk is studied in further detail by Amy E. Skillman in "The Humor of a Tradition Bearer in the Lumber Yard." She discusses the anecdotes, jokes and occupational knowledge of lumberyard workers in Southern California. According to Skillman, any of these traditions may act as a, "cultural identifier among people who have the same set of shared experiences, a way to distinguish themselves from those who do not share those experiences and to distinguish their skills from non lumberyard workers" (67). Sea urchin fishers consider their knowledge of the industry to be superior to that of the authorities of

the Department of Fisheries and Oceans, as they are the ones who actually go underwater and observe and harvest in the environment of the species. DFO officers do not venture into the environment of the sea urchin. The separation between the two reinforces the attitude of the sea urchin fishers and promotes a feeling of autonomy, as they are closer to the industry than anyone else.

5.4 Cohesiveness of the Group

Michael Argyle, in The Social Psychology of Work, examines the factors in the workplace that create a sense of cohesiveness, allowing a group of workers to see themselves as separate entities from other groups. The framework set out here further illustrates the group identity of sea urchin fishers. Some of these factors that apply to the group of sea urchin fishers studied here include: physical proximity, same or similar work, an incentive system, size, and attitudes toward other groups (117-21).

According to Argyle, individuals who work in close proximity to each other develop a connection, or a sense of cohesiveness after a period of time working together, even if the tasks they complete vary (117). The group of sea urchin harvesters studied here fished together from October to April, for two separate seasons. A typical workday for this group entailed driving to a dive site together, aiding each other in the preparation of equipment, harvesting together, culling together and transporting urchins to the point of sale together. Although diving was not feasible every day, the group did travel to potential dive sites on a

regular basis. Therefore, although harvesting was not conducted every day, divers collectively travelled, discussed dive sites, markets and the industry in general on a daily basis. Throughout these two seasons close relationships developed between group members to the point where socializing outside of the work environment became regular. In fact these connections went beyond the sea urchin season, and the group members often took part in other recreational activities, such as sport fishing and vacationing together.

Argyle also suggests that conducting the same or similar work in close physical proximity allows group members to identify more closely with the group, as they develop and share strategies to deal with any obstacles they may face in the occupation (117). The cautionary narratives discussed earlier in this chapter fit Argyle's criteria as they function to decrease the risks of the job. As members of the group are intimately familiar with the tasks that every other member of the group has to carry out, these stories serve to unify the group as a whole. Also, harvesting methods are shared, as well as knowledge of high yielding areas for harvesting. This shared knowledge leads to the incentive system, the next factor described by Argyle.

A group bonus system or incentive system makes for a more cohesive group, says Argyle. When the efforts of each group member are in the best interest of all members of the group, workers tend to be more productive as they understand their importance to the group dynamic (118). The group of divers considered here was equipped with the same harvesting techniques and

knowledge. No one diver had any advantage over the other in terms of access to harvestable urchin. One exception would be the skill of one diver when compared to another as a commercial diver. It was known and accepted by all members of the group that Shane was the "best diver" as he was able to stay submerged longer than the others, thus getting more work done. He utilized less energy underwater than the others, therefore allowing his oxygen supply to last longer. Nevertheless, harvests were split in equal portions between divers on any day that diving was conducted from shore. When diving was carried out from a boat, as much as half of the profit went to the boat owner, while the remaining shares were split equally among the divers. It was therefore in the best interest of the divers to act as a unit, aiding each other as much as they could, in order to complete as much work as possible. Following harvesting, culling and transporting of urchins was carried out by the entire group in a unified fashion. These tasks were carried out in a calculated, efficient manner on a regular basis, as each member knew his role in attaining high productivity, resulting in higher group benefits, and thus higher individual benefits.

Argyle also suggests that size of the group is a major factor in its cohesiveness, as smaller groups experience higher levels of interconnectivity. He measures the effects of group size by looking at levels of absenteeism among workers in large occupational groups, as opposed to those in small groups. Levels of absenteeism were much less in smaller groups (119). The study group of urchin divers consisted mainly of four core members, although a few other

divers would work with the group on an occasional basis. As with Argyle's study, attendance on the job site was a factor for this group, as when one diver could not make it for any reason, the full group would refrain from diving on that day. This also reflects the fact that each group member was integral to carrying out the tasks of any given day.

A final factor that Argyle cites is the attitude of group members to other groups, which is often quite negative if outsiders are seen as having goals or ideas that contradict or annoy them (121). This type of viewpoint towards outsiders was evident in the group of sea urchin divers. In many cases, members of the communities in which the divers harvested would systematically drive by the dive sites, in an effort to see exactly what was going on. The attitude of the divers was that these people were not accustomed to seeing such activities in their communities and therefore were just seen as nosy. The divers looked negatively upon such community members, as the divers did not trust them. In fact, they often thought that such observers were simply looking for reasons to contact local authorities, more specifically the Department of Fisheries, to report any wrongdoings of the divers. The result of these feelings frequently resulted in a fabrication in the information relayed to any seemingly untrustworthy outsider observers. The divers would regularly lie to anyone who asked questions about the price of urchins, how to harvest, how many urchins were available, and where the urchins were being bought. Although the partial purpose of this was to "thwart the nosiness of the outsiders," there was also a

protection of sorts of their place in the industry. Shane said on several occasions, "if you tell them anything, the next thing you know, they'll be at it."

Chapter 6: Vernacular Knowledge

6.1 Defining Vernacular Knowledge

Popular knowledge, local knowledge, traditional knowledge, indigenous knowledge and vernacular knowledge are all terms that have been used interchangeably to describe the body of knowledge held by a specific group as it relates to their surroundings or way of life. There is a plethora of meanings associated with each of these terms, many of which act in a negative fashion, as they are seen to throw into question the credibility of the knowledge itself. A number of definitions are examined here in order to find commonalities, and to draw parallels to other folklore terminology, as well as identify some of the obstacles that have been encountered with these folkloric terms.

In looking at sea urchin fishers in St. Lucia, Gary Warner describes popular knowledge as the observations that fishers make that can be a valuable addition to scientific knowledge, and used in the conservation of sea urchin stocks. This knowledge is accumulated through years of living in the environment that these fishers rely on to make a living (39). Warner sees real value in this knowledge, and illustrates how it is used to improve the lives of those who possess it, while improving their relationship with more formal management bodies. Warner's study on popular knowledge will be further analyzed later in this chapter.

Stephen B. Brush, in "Whose Knowledge, Whose Genes, Whose Rights?" provides several definitions of indigenous knowledge, effectively problematizing the term and illustrating the complexity of its usage. He writes:

> ...broadly defined, indigenous knowledge is the systematic information that remains in the informal sector, usually unwritten and preserved in oral tradition rather than texts. In contrast, formal knowledge is situated in written texts, legal codes, and canonical knowledge. Indigenous knowledge is culture-specific, whereas formal knowledge is decultured. (4)

A clear division is identified here between formal or scientific knowledge and informal or indigenous knowledge. It is this seemingly arbitrary split between what constitutes one, and not the other, that has caused numerous problems with resource management, not the least of which has been the aforementioned management of cod fish stocks off the coast of Newfoundland and Labrador.[35] This division however, is not always as clear-cut as Brush suggests, and according to Robin McGrath, does not need to exist at all.

McGrath uses the term traditional knowledge in "The Pond Gave a Sigh: Traditional Knowledge of Ice." She defines traditional knowledge as "the set of concepts, propositions, and theories unique to each particular culture group in the world" (9). She goes on to say that this knowledge is often learned from the elders in one's family or community, and it is simply a combination of simple logic and accumulated wisdom. According to McGrath, as with scientific knowledge, those who possess traditional knowledge use language that requires a level of decoding, and they choose to share their knowledge only in particular situations,

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[35] As discussed in Chapter 1, there has been much debate as to the reasons for the cod stock depletion and as to the potential of a joint management scheme.

such as the fishing loft. McGrath looks at the information that scientists were able to learn from local fishers in Newfoundland regarding icebergs off the coast of the province. One specific example relates to the warning signs that fishers were able to detect regarding when a large body of ice was about to roll over. The scientists were able to take this information and incorporate it into their own research (9). While McGrath asserts the importance of both traditional and scientific knowledge, she also discusses problems that may arise when the two come into conflict with each other, and a decision must be made as to which to accept. She argues, in fact, that the two are not necessarily mutually exclusive, and that there is high potential to integrate the two into a more concise, cohesive body of knowledge.

Complexities associated with the term indigenous knowledge are identified by Ladislaus M. Semali and Joe L. Kinchloe in their book What is Indigenous Knowledge?. They assert that the concept is often associated with the primitive, wild and natural, thus causing such knowledge to be scrutinized, and the validity of those bodies of information to be questioned. However, for those who possess it, this type of knowledge has come to reflect the dynamic way that individuals understand themselves in their environment, and how they organize it and react to it in order to enhance their lives (3).

Problems exist with such interpretations as those cited by Semali and Kinchloe, in that those who possess such information are viewed by more dominant cultures as uneducated, rural peasants, much the same way as early

folklorists categorized the "folk".[36] With the advent of contemporary folklore scholarship came a broadening of the understanding of who "possesses" folklore; along with that, came a re-evaluation of common folklore lexicon. In looking at definitions of popular, indigenous, traditional and local knowledge, it is therefore necessary to consider the term vernacular. In discussing Newfoundland vernacular music, Peter Narváez defines the word vernacular as referring, "to both those traits of culture that people actually make for themselves…and to its more conventional meaning of indigenous culture, culture that develops in a given locale" (215).[37] Narváez uses the term vernacular as an alternative to the more conventional descriptor, folk. Folk has more ideological baggage, as understandings of its meaning are ambiguous. Additionally, as Brush argues, indigenous may also be interpreted as only describing, "non-Western cultures and ethnic minorities" (5). Vernacular has become a more inclusive term, venturing beyond the narrow scope as described by Semali and Kinchloe, as well as Brush. The term vernacular knowledge can easily be applied to the body of informal knowledge created and held by individual groups, and surpasses much of the negativity associated with more traditional terms.

The debate as to the importance of popular knowledge in comparison to scientific information is quite often at the forefront when it comes to the management of natural resources. However, as has been stated by all scholars

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[36] Discussions of folkloric attitudes of early folklore scholars can be found in "What is Folklore?" by Alan Dundes.
[37] Further discussions of the term vernacular, as it relates to folklore studies, may be found in the writings of Primiano (religion) and Brunskill (architecture).

cited here, who have weighed in on the debate; when traditional knowledge meets with modern scientific knowledge, the latter tends to suppress the former, either by denying its existence or validity or by incorporating it without any acknowledgment.

6.2 Vernacular Knowledge and Participatory Management

Participatory management, or co-management, as it is often called, refers to the sharing of power in the management of a resource between government agencies and community-based stakeholders (Pinkerton 331). Features of this management style include a focus on human resources and development, a respect for local, traditional, popular, indigenous, or as it is termed here, vernacular knowledge, community empowerment, social justice and genuine discussion between government and community stakeholders. More conventional styles of management are structured on a top-down basis, with economic rationality and responsibility at the centre. A one-way flow of knowledge based on the findings of science and technology is assumed, and relations between government and community can be described as patron-client (Warner 32). This conventional style of management falls under the guise of what Gramsci has dubbed hegemony, as dominant groups in society, through a process of "intellectual and moral leadership" gain the consent of subordinate groups within that society (Gramsci 57). John Storey further explains that in this type of society, although there is oppression and exploitation, there is for the

most part consensus and a high degree of social stability, as the subordinate groups in society appear to conform to the ideas and policies of the ruling class (124).

There is no set model of participatory management, as the term covers a wide range of situations and possibilities, with varying levels of decision-making capabilities attributed to local community-based stakeholders in a resource (Warner 30). However, the amount of decision-making authority granted to such community groups is often minimal. The call for participatory management in the fisheries has been ongoing in numerous parts of the industry. In large part this call has come in the form of informal analysis of the plight of the fisheries by those directly involved in them. One specific example is the effect of offshore dragging on the inshore fixed-gear fisheries.[38] Fishers argued that offshore dragging had a negative impact on the amount of fish that would migrate to shore in adjacent areas, thus lowering the amount of fish being caught by inshore fishers (Palmer 16). In addition to this, the physical size of cod caught by inshore fishers was observed to be much smaller, according to those fishers, after the advent of offshore dragging. Allen Williams, an elderly man who had fished the waters off the Southern Shore for years prior to the announcement of the moratorium, and noted by others in the community of Ferryland as an individual who knew those waters well, suggested that the larger breeding fish were being

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[38] Offshore dragging for cod was done in larger boats, often more than ninety feet in length that go to sea for multiple days. Inshore fixed gear was used in smaller boats, often called skiffs, which fished using more traditional methods, such as the cod trap.

taken from their actual breeding grounds before they were given the opportunity to migrate shoreward (Williams). Williams' claims were shared by many other established inshore fishers in the province. In all of these cases, the formulations arrived at by those possessing local knowledge was all but ignored.

6.3 Sea Urchin Fishing in St. Lucia

Literature focusing on the social aspects of sea urchin fishing is scarce. Gary Warner's study of the sea urchin fishery on the island of St. Lucia in the Caribbean is an exception, however, and is quite useful in illustrating the potential importance of the vernacular knowledge of harvesters as it relates to participatory management of an industry. Warner's observations are of particular interest as he documents the sea urchin fishery of a region that has successfully emerged from a period of depletion.

In St. Lucia, the sea urchin fishery began at a minute subsistence level where the commercial value of harvests was minimal. It continued this way up until the 1960s. The white-spined sea urchin is the species caught in the Caribbean, and it is usually found in shallow waters within free diving range.[39] Warner explains that, traditionally the fishery in St. Lucia was family-based with harvests providing subsistence income and family use. For some, it provided a source of income, during the winter months, when the agriculture season was over (32). Warner further states that, although the fishery was in essence what

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[39] Free diving refers to the practice of diving without the aid of any equipment.

Harden refers to as a "commons regime" in that it was open to all, the actual number of divers was limited. There is a parallel situation between the urchin fishery in St. Lucia and the salt cod fishery in Newfoundland and Labrador. Entire St. Lucia families would be involved in the harvesting, cleaning and cooking of the urchins, even though only one or two family members would actually dive. Up until the 1960s, this style of fishery apparently did nothing to deplete stocks, as urchin extraction did not outstrip or compromise the supply. Urchins were kept at a sustainable level on an annual basis (Warner 33). This family-based industry is not unlike the Newfoundland salt fish industry in the days before the advent of fresh frozen product.[40] Newfoundland and Labrador's fishery also was able to operate effectively without jeopardizing codfish stocks. Here, most often male members of the family would actually go out in the skiff on a daily basis, and other family members would take care of the gutting, splitting and drying procedures on shore. This salt cod fishery was able to sustain itself, and despite periodic seasons of feast or famine, the fishery remained viable. It may be argued that another factor as to why cod fish supplies were not jeopardized under this style of harvesting, was that intensive labour demands were such that not everyone was able to actually fish, because so much work was left to be completed on shore.

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[40] The shift toward fresh frozen product occurred in Newfoundland and Labrador after Confederation with Canada in 1949. For a detailed look at the salt cod fishery in Newfoundland, see Mark Ferguson's "Making Fish: Salt Cod Processing on the East Coast of Newfoundland, A Study in Historic Occupational Folklife".

The parallels between the St. Lucia sea urchin fishery and the Newfoundland salt cod fishery end when considering strategies to rebuild depleted stocks. In St. Lucia, a joint management shared between government and fishers was instituted and was successful in bringing back a viable fishery. However, in Newfoundland, depleted cod stocks have not returned. The current sea urchin fishery in St. Lucia can, though, be used as a model for success when looking to the emerging sea urchin fishery in Newfoundland and Labrador.

6.4 Comparing St. Lucia to the Newfoundland Case

The new sea urchin fishery in St. Lucia that does consider the knowledge of urchin fishers can easily be compared to the current fledgling sea urchin industry of Newfoundland and Labrador. For completely different reasons, the number of harvesters in the province is also relatively small. With the loss of the commercial cod fishery, many Newfoundland and Labrador fishers have no doubt turned to what were once underutilized species. Primary among these are crab and shrimp. For the most part, fishermen have turned to species whose harvesting methods conform somewhat to those of the cod fishery in that the harvesters make their catch at the surface of the water, from a vessel of some sort. These fisheries are new in terms of their importance to the quality of life of fisheries workers, as well as the overall economy of the province, but the knowledge and equipment necessary to partake in these fisheries is not completely foreign to the Newfoundland fisher. Even at the height of the cod

fishery, some of the species that are sought now as a primary means of income were once harvested for supplementary income.

Also, and perhaps more importantly, the federal Department of Fisheries and Oceans (DFO) has not yet determined the potential for a sea urchin fishery in Newfoundland and Labrador. Therefore, the number of licenses granted to date has been limited. In fact the "licenses" are dubbed as exploratory, and are essentially permits.[41] Therefore, the number of divers who can get involved in the industry is kept to a minimum.[42] In any case, as in the current form of the fishery in St. Lucia, the number of sea urchin fishers in Newfoundland is low. Also in St. Lucia, since a participant-managed fishery was instated, the number of sea urchins harvested on a yearly basis has not damaged the overall stock, as the supply has replenished itself adequately. This mirrors the current Newfoundland and Labrador case as well with many areas of the province's waters left unexplored, again as a result of the low numbers of fishers involved in the urchin industry. Harvesting of the green sea urchin by SCUBA diving is not seen as a major threat to the species, as the urchin can flourish in water depths well beyond the range of SCUBA divers (Miller and Nolan 2).

Warner's study explores the initial collapse of the sea urchin fishery in St. Lucia as market pressures increased once the monetary benefits of the fishery were discovered (35). This type of environmental tragedy has been focused on

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[41] The difference between a license and a permit is that a permit has to be updated and reissued on an annual basis, whereas a license is permanent.

[42] Although policy is firmly in place regarding the granting of "licenses", most divers spoken to throughout this study were suspicious of others joining the industry illegally. However, no evidence was seen that anyone had.

in several studies involving commons regimes. One mutual factor seems to be that the devastation of a given resource occurs when profit-driven forces replace community-based regimes. The former has no long-term vested interest in protecting or saving the balance of an ecosystem in a given area (34). The resource is systematically depleted to the point of exhaustion. This situation is all too common and resembles the scenario involving the Newfoundland cod fishery, as explored in Chapter 1.

6.5 The Value of Vernacular Knowledge

Warner's research focuses on the importance of vernacular knowledge in restoring and revitalizing the St. Lucia sea urchin fishery. This case study needs to be examined for the purposes of this study in order to place a value on the knowledge of local Newfoundland sea urchin divers. In St. Lucia, divers now collaborate with the local Department of Fisheries in co-management of the region's sea urchin fishery. The knowledge possessed by the divers themselves is recognized as being vital to the protection of the resource and therefore the fishery. Some divers in the area resort to spear fishing in addition to sea urchin diving on a year round basis in order to earn an adequate income. As a result, these divers are constantly in the vicinity of sea urchins and are able to observe the creature in its natural habitat (42).

From these observations comes a wealth of information. Local urchin harvesters have been able to pinpoint the period when urchins hatch, as well as the conditions in which they do so. One diver in Warner's study says:

> The eggs generally hatch around October or so. You see the weeds come and cover the sea eggs, so you know they are hatching. So when you come and collect the sea eggs, you see the small ones there. Sometimes you find them in bundles, covered up. If you pick up the bundle and take out the seaweed, you find the eggs. That way the water can't move them...When they mature, you see the prickle on them become a brownish color....The sea urchins do not stay in one spot, they move around. The reason why they move is to look for food. There would be some in the grasses, some on the reef, some on stones. When you get the surf, you would get them on the reefs. ...The other way to know if it is mature, if you don't break the shell, the eye to the top is pink; and if you smell it, it smells very nice...The dead ones are causing the lack of harvesting. You're supposed to harvest the eggs every year to make room for the new ones. (40)

In St. Lucia, the Department of Fisheries uses the information relayed from divers in issuing the proper regulations for each harvesting season. In essence, all boundaries of the fishery are set based on a collaborative effort between the divers and the Fisheries Department. The number of divers involved in the harvest on a yearly basis is controlled through the issuing of licenses. Pre-season information is made available each year in order to inform harvesters of the potential for the upcoming season. The geographic limits of the fishery are set each season. Once the season begins, the fishery is monitored on a regular basis to ensure that catch and size regulations are met and that the stocks are able to withstand the quotas set for the given season (Warner 38). As evidenced here, the harmonious integration of formal and informal knowledge

systems results in efficient harvesting, and subsequently prosperity for the fishers of the region.

Warner outlines the reasons for incorporating community involvement into fisheries management:

- government departments do not have the capacity on their own to collect all the necessary data, as well as to provide ongoing monitoring and enforcement of regulations;
- the involvement of the community in data collection and management decision making leads to greater compliance of the community with regulations and results in reduced enforcement costs;
- community-based management can lead to improved biological knowledge;
- community involvement promotes a sense of collective responsibility for the sustainability of the marine resources; it allows for a better balance to be struck between present and future consumption, and between commercial and other interests;
- community involvement provides a better perspective for defining the property rights of the community;
- community involvement helps to improve the relationship between the government and the fishers;
- community involvement enhances the status of fishing and other forms of marine resource harvesting as an occupation. (36)

This community involvement, as discussed by Warner, highlights knowledge of the environment and the resource itself. Similarities are evident here between this industry in St. Lucia and the Newfoundland sea urchin fishery.

6.6 Harvesting Knowledge

The risks of open access harvesting within a commons regime can be, and has been, detrimental to the viability and sustainability of numerous fish species, not the least of which has been the Newfoundland cod fishery. A

specific knowledge system of the resource plays a large part in preventing such depletion. Such is the case with the Newfoundland sea urchin fishery. It is the high level of information possessed by fishers within the sea urchin fishery that allows them to practice techniques that not only result in the harvesting of marketable sea urchins, but also helps in the preservation of the resource.

Experience steers harvesters toward which sea urchins should be taken, and which should not. Paramount among the factors taken into account in this process are maturation levels, sea floor environment and food sources. As is explained in the following section on the Japanese sea urchin market, these factors are important, as they help in determining the value of the product sold. Divers learn from experience that seven to ten year old sea urchins are at the harvestable level and this age is determined mainly by the size of the sea urchin. The minimum 1 and 7/8 inch width of a sea urchin is associated with this level of maturity. As was discussed in Chapter 4, the culling of mature urchins is very important, as urchins below the size limit will not be bought by processing plants. Harvesters, therefore, make great efforts to not take small urchins as they are better left for harvesting in a future year.

Divers also take into account the environment in which sea urchins are found, and the food sources that are available within this environment. Divers will case an area thoroughly in order to determine whether or not environmental conditions are optimal for harvesting. If not, divers have learned to move on to better suited areas and not waste time harvesting urchins that will have little

monetary value. Also, divers have learned that it is best to leave these areas untouched as potential exists for sea floor environmental conditions to change over time, possibly improving and making for a more harvestable area in the future. This knowledge is common among sea urchin divers and has come mainly through experience. The need for such knowledge has emerged mainly from the demands of markets, most specifically the Japanese market.

6.7 Knowledge of the Japanese Market

One major factor that needs to be considered by sea urchin divers is the market that is the eventual destination of their catch. The Japanese consume between 90% and 95% of the world's current sea urchin production, and 100% of Newfoundland's product. This is no surprise given the fact that Japan is the world's largest consumer of fish products (Gillingham et al. 5). The Japanese, when importing sea products, place paramount emphasis on quality. This is not new in the Newfoundland fishery as local fish plants have had countless experiences in dealing with Japanese businesses in their quest for another delicacy of the far east, capelin roe. Newfoundland fishers are therefore accustomed to fishing for product that will be of taste to the Japanese. However, the specifics of the sea urchin fishery differ greatly from the capelin fishery.

Within the sea urchin fishery, there are five factors that are considered by Japanese consumers in determining the value of the product: freshness, colour, yield percentage, taste and presentation. Some of these are within the control of

the diver, while others are not. In either case, the consumers are in fact those who determine the success of any harvest, as they control the markets in Japan, thus affecting prices paid to divers. Meeting the demands of the consumer is one of the primary considerations of the sea urchin diver as he/she scours the ocean floor for viable urchins (Gillingham et al. 9).

In looking at freshness, the foremost reason for its importance is the fact that the sea urchin roe is ultimately consumed raw, usually as a dish called "sashimi" (raw fish) or "sushi" (fish decorated with rice and seaweed). It is therefore imperative that the product arrives at the marketplace as quickly as possible (Gillingham et al. 8). Thus, it is in the best interest of divers to get urchins to the processors as quickly as possible. In situations where divers cannot, and are forced to hold their urchins for two and sometimes three days, the task of preserving their freshness becomes tedious. As described in Chapter 4, divers are forced to find an area in the salt water where urchins can be left relatively unharmed. This space has to be one where the current or tide is very low, as the urchins cannot be rolled around on the ocean floor inside the bag, once they are laid to rest there. The area has to be relatively sheltered. In finding this area, knowledge of the tide and swell patterns of a given location is essential. Shane describes such an area in Ferryland, "...we used to leave them over in the Pool. It was the only place in the harbour fit for it. Right back in the gut is good. There is a big run out in the mouth, so it's no good there." Great efforts are taken to ensure that not one spine on one urchin is broken before

getting the catch to buyers, as broken spines weaken the defenses of the urchins, and speed expiration.

Another factor of importance is the colour of the roe inside the urchin. A bright yellow or bright orange is preferred.[43] Ultimately, the diver will never see the actual colour of the urchins that he/she harvests and sells to the processor, thus it may seem like an impossible task for the diver to determine roe colour; however, it is not. With experience, a diver can get a fair idea of the colour of the roe being harvested by doing some investigating of a dive site prior to harvesting. A diver will essentially find a patch of urchin and test the quality of urchins around

Figure 6.1: A diver cracks sea urchin underwater in order to check for potential yield and roe colour.

[43] The yellow and bright colours do not affect taste, but are preferred as they are aesthetically pleasing.

the boundaries of the patch, as well as in its midst. This is done by swimming along the edge of the patch, and using a knife or cracking tool to open urchins at selected intervals, as seen in Figure 6.1. A knife is inserted into the centre of the top of the urchin and the shell is separated into two parts. This way the gonads stay intact on both sides of the shell. The colour of the roe is examined and noted in relation to a variety of factors such as water depth, bottom type (i.e. rock or sand) and type of kelp and/or other food type available. The diver determines which area has conditions favourable to high quality urchins and decides to harvest this area. Most often, this method provides successful results. In time the diver becomes familiar with various types of harvesting conditions and is able to decide which areas are favourable and which are not, simply by looking. The viewing glass, described in Chapter 4, can be used to view the sea floor for food sources, bottom type and urchin appearance, all of which are an indirect indication of gonad content (Seabright 22). This can be done without ever having to get in the water and possibly wasting valuable time at a site unfit for harvesting. With experience, the amount of time spent testing urchins for quality decreases, increasing the time spent harvesting, thus increasing productivity.

In the same manner, while checking urchins in a given patch, divers will also pay special attention to the amount of roe inside the urchin. The yield rate, as it is known, has to be approximately 12% if the harvesting is to be profitable.[44]

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[44] Although market prices vary based on availability and quality of urchins, the standard price paid for sea urchin roe as of the time of this writing is eight cents per pound for each percentage of roe present in the urchins. 12% yield would bring a price of ninety-six cents for each pound of urchins harvested. 1000 pounds of urchins harvested in one day, which is quite possible, could

This percentage is calculated by comparing the weight of the cleaned roe sacks to the total weight of the urchins. Therefore, the weight of the roe inside the urchin must be at least 12% of the total weight of each urchin (Gillingham et al. 8). As one diver describes, judging the amount of roe in an urchin only on sight is a skill that does not come immediately:

> When I first started, I would never check them out. I wouldn't crack one of them. I just swam around taking whatever I saw. When we got out of the water I'd crack a few and sometimes find nothing. I spent an awful lot of time taking urchins that were worth nothing. And then even when I started opening them, it was hard to tell what percent they were. If there was anything inside I was usually happy. But when the word came back from the plant, it was sometimes too low. After a while though, it got better. With the roe, it just takes checking a lot of urchin. The real full fat roe sacks are the best. I really didn't know one until I saw one. (R. Ford)

In testing dive sites for marketable sea urchins, Newfoundland divers have distinguished three bottom types considered best for harvesting. According to George O' Brien, an experienced diver, and one of the original sea urchin harvesters in Newfoundland, those ocean floor surfaces are the beachfront bottom, the reef bottom and the flat gravel bottom. The beachfront bottom is essentially a rock bottom that starts near the shoreline and tapers off into a sand bottom. The reef bottom is simply a rough rocky bottom and the flat gravel bottom is just that. When testing these areas, the diver should first test the quality of urchins along the edge of the kelp line, noting the types of kelp the

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bring a pay of $960. Of course, as weather conditions often dictate the number of dives that can be done, it is rare that this much money can be made on a daily basis.

urchin are feeding on.[45] Certain feeds are known to divers to produce the best colour roe and the largest, firmest roe sacks. On the other hand, a brown rockweed, which is very common, produces a darker colour roe and is, therefore, considered a poor feed.

The first three factors can be directly controlled by the harvester, whereas the final two cannot. The taste of roe is considered by the Japanese when deciding the value of the product. As sea urchin roe is outside the realm of the average Newfoundlander's or Labradorian's diet, and requires an acquired taste, most divers have no method to distinguish taste. Shane, however, who has eaten sea urchin roe, found himself no more knowledgeable after the snack. "I ate it and I didn't think there was any taste to it. It was just like salt water really, with a kind of rubbery texture to it." The one thing that divers do know is that bright colour is associated with good taste by the Japanese (Sea Urchin).

The final factor of importance to the Japanese is the presentation of the roe sacks once they are ready for consumers in Japan. This is sometimes the task of the processor in Newfoundland, although it is most often left to a secondary processor in Japan. In any case, the roe must be presented in an aesthetically pleasing fashion whereby it is distributed in a proper uniform way on a traditional wooden tray packet (Gillingham et al. 9).

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[45] The best kelp feeds are considered to be laminaria digitata and laminaria longicruris, according to their scientific names. Divers know these kelps however as broad-leaf kelp or strap kelp and cabbage kelp respectively (Sea Urchin).

The food customs of the Japanese place primary importance on aesthetics; food should not only taste good, but look good too. Shapes, colours, and textures of both the food and the ware are selected according to the aesthetic principles of Japanese cuisine ("Japanese Cuisine"). Many Japanese believe that attention to detail and neat presentation of dishes will vastly improve the appearance of the food that is served while also increasing the appetite (Lee). The Japanese enjoy the artistic sense and beauty of the display and arrangement of the food, that even goes as far as the choice of receptacles used for serving it. Sometimes, even the rooms where the dining takes place is considered as part of the art. The more beautiful the food looks, the more delicious it is thought to be. Much thought is put into the preparation of food by the Japanese, which often ranges from a sense of season, to a feeling for nature, or to an eye for colour, all of which must be skillfully incorporated ("Even the Colour").

As Newfoundland and Labrador sea urchin divers harvest the ocean floor for their catch they have, whether consciously or unconsciously, incorporated these Japanese food traditions into their own body of knowledge, as it pertains to harvesting. The preferences of the Japanese consumer is etched in the mind of the sea urchin harvester.

Chapter 7: Synopsis, Conclusions, and Recommendations

Based on the research conducted, the potential for the use of vernacular knowledge within the management of the sea urchin fishery in Newfoundland and Labrador is vast. If this body of knowledge is to be incorporated, communication needs to be developed between the fishers and those in positions where policy is created. The practices of the cod fishery before the initial moratorium of 1992 need to be put aside, and along with it the elite professionalism currently in place that questions or ignores the legitimacy of vernacular or popular knowledge systems. This seemed to have started with the initiation of the Fisheries Resource Conservation Council (FRCC) in 1993 by the Government of Canada. The impetus behind the formation of this council was to bring a degree of transparency to fisheries management through the establishment of such advisory committees. The FRCC seeks to integrate industry knowledge gained from day-to-day working experience with scientific advice emerging from research. The Government of Canada claims that it is committed to a more effective role in decision-making policy for those with practical experience and knowledge in the fishery (FRCC). The unfortunate reality is, however, that the federal Minister of Fisheries and Oceans is under no obligation to accept any advice forwarded by this or any other similar group (White Paper 14).

On May 14, 2003, Newfoundland and Labrador's House of Assembly passed a resolution seeking negotiations between the province and the

Government of Canada on the establishment of a joint management scheme for the province's fisheries (White Paper 1). According to the provincial government, joint management is the most effective way to achieve responsible fisheries management and related economic development (White Paper 2). The Royal Commission on Renewing and Strengthening Our Place in Canada, released in 2003, stated that intergovernmental collaboration is the only way to save a fishery that is characterized by a collapsed groundfish industry and a vulnerable shellfish industry. The current state of the fisheries, under the jurisdiction of the federal Department of Fisheries and Oceans, mistakenly sees its management depending largely on the science of the federal department (114).

Despite the repeated crises of fish stocks in the Newfoundland and Labrador region, funding for science in this region has declined over the past ten years. The interrelationship between seal populations and groundfish populations has been largely ignored. Monitoring of capelin stocks, known to be a primary food source of groundfish, has diminished. The industry now depends almost completely on shellfish stocks, although scientific information on the species most affected, such as crab, is extremely limited (White Paper 8).

If new fisheries, such as that of sea urchins are to be successful, a genuine embracing of the body of vernacular knowledge held by members of this fishery needs to occur. From here, an effort needs to be put forth to actually collect all of the information that is available. This requires an initial communication between fishers and government. If this is to happen, a first step

needs to be taken to educate local authorities within the fisheries management scheme with regard to what is happening in the industry. As was pointed out here by my informant Shane, very little is currently being done to monitor the sea urchin fishery, and divers, therefore, work in a vacuum of sorts.

Once collected, popular knowledge needs to be verified or tested and then incorporated into management systems along with existing scientific information. In addition, efforts should be made to ensure that the body of vernacular knowledge is passed to all new entrants in the fishery as this information is undoubtedly at the foundation of a viable fishery. The confidence and sense of empowerment of the fishers is evident here. As Shane points out:

> We know how to make this work. We know where the urchins are, the best ways to get them and what the best conditions are for harvesting. If they are going to open up this fishery, they need to know this stuff. Nobody from DFO passed this to us. It can help them in opening up the right areas, and protecting other areas. Also, safety issues and proper training should be looked at. Maybe they need to offer a course just for sea urchin divers. These are all things that we could do. (S. Wallace)

Large portions of the findings of this study might be beneficial in establishing a co-management system of monitoring a commercial sea urchin fishery in Newfoundland and Labrador for the approximately 200 at the time of this writing (S. Wallace). As outlined in Chapter 1, the shortcomings of federal management of other fisheries need to be addressed. The failures of the cod fishery must not recur, especially if the sea urchin fishery is going to be opened to larger numbers of fishers. Coastal communities are unlikely to sustain further social and economic devastation as that brought on by past mismanagement.

The evolution of the sea urchin fishery, as studied in Chapter 3, illustrated that industries have come and gone in various regions around the world for different reasons. Lessons need to be taken from these other regional industries in order to ensure a viable resource in Newfoundland and Labrador.

Chapter 4 explored the vast body of knowledge that sea urchin divers must possess in order to successfully harvest sea urchins. The techniques, practices and skills focused on here are necessary for any individual who wishes to take part in this occupation. Along with this body of knowledge go distinct features of belonging to such a group as sea urchin fishers. Chapter 5 looked at identity and autonomy among sea urchin fishers as they relate to one another and their industry, in addition to the narrative traditions of the group. In Chapter 6, the provincial sea urchin fishery was compared to another more established sea urchin fishery, where participant management is paramount. This fishery in St. Lucia is used as a potential model for the Newfoundland and Labrador fishery. The knowledge of the Newfoundland and Labrador fishers stems from the demands placed on the harvesters by the markets they supply.

Throughout the entire study, the dynamics of a folk group have been documented in addition to the benefits of giving credence to vernacular knowledge systems. Themes of identity and community have been tied to the occupational folklife of a unique group, with an eye to suggesting improvements for future developments within the new Newfoundland and Labrador fishery.

7.1 Suggestions for the New Industry

One certainty that emerges from this study is that participants in the Newfoundland sea urchin fishery do have a wealth of information that should be deemed valuable by those who manage and create policy within government fisheries departments. What follows is essentially a list of the assets that these fishers possess that are necessary components of sea urchin fishery management in Newfoundland and Labrador if the disastrous errors of past management schemes are to be avoided.

First and foremost, those presently in control, most notably the federal and provincial fisheries departments, need to make conservation a priority in their policy-making procedures. They cannot bend to the special interests of big business. Neis and Kean illustrate that it is when science is immersed in government bureaucracy or is heavily funded by industry that resistance generates regarding reduction of quotas, fisheries closures and alternative approaches (90). What then needs to be recognized by government is that it is when profit driven forces take a controlling stake in resource based industries that community-based regimes become secondary, leaving resources susceptible to exhaustion. Numerous examples of this occurrence can be cited, most notably the collapse of the cod fishery in Newfoundland and Labrador. On a smaller scale, although just as devastating, logging and mining towns have suffered the same fate as the greed of large business interests have left communities without a basis for their existence. Government legislators have a

role to play here as well, as community stakeholders need to be given equal roles in the management of the resource industry in which they work. With local stakeholders having such a voice, the conservation of sea urchin stocks in Newfoundland and Labrador would undoubtedly be a primary concern of the management group, as is the case in the St. Lucia example cited in Chapter 5, thus ensuring the longevity of the resource.

As J.D. House states, the contribution of government in terms of revitalizing outport Newfoundland has to be in the form of "capacity-building" (241). The phrase capacity-building, has been defined as follows:

> Enabling indigenous people of developing countries to carry out development processes successfully by empowering them through strengthening domestic institutions, providing domestic markets, and improving local government efforts to sustain infrastructures, social institutions, and commercial institutions. Capacity-building also means that we need to recognize indigenous interest groups, encourage local efforts, provide incentives for privatization, and link local, regional and international strategies to enhance productivity and wise use of natural and human resources. Above all, a 'bottom-up' or grassroots effort for sustainable development must be encouraged in developing countries. (James xvi)

House takes this definition and refers to Newfoundland and Labrador as a 'developing province' (241). This notion essentially means that empowering local residents in small communities through full governmental support will help create and secure their own futures.

In a joint management role, sea urchin fishers would have the knowledge needed to run a fishery on a more established scale than the current exploratory fishery. Those who have partaken in this exploratory fishery need to be

consulted in order to help set season start and end dates, as they know when sea urchins spawn in the various coves, harbours and bays around the province. This is valuable because spawn dates fluctuate between geographic areas, depending on the water temperature. Setting correct season dates is extremely important also from a conservation standpoint as it prevents the unnecessary harvesting of urchins during periods when roe yield is not high, or even after urchin have already spawned. Also, regarding the status of exploratory permits, perhaps it is time for government to grant licenses for the fishery. These could still be kept to a minimum in order to keep large numbers out of the fishery. The benefit of granting a full time license would be that it does provide a more secure future for those involved in the fishery, and would allow them to invest more in their enterprises, thus further professionalizing the industry. Unfortunately, government is hesitant to make such concessions in the wake of the debacle of the early 1990s. Simply granting permits to fishers is a tool used by government to limit its responsibility to them in the case of a major stock decline, or a closure (Clarke 149).

In addition, sea urchin fishers, through their direct experience with the resource, know the exact areas where harvestable urchins are more likely to be located, as they know the food sources that exist in these areas that highly influence the quality of the roe inside the urchins. With this knowledge, fishers need to work in conjunction with Department of Fisheries and Oceans scientists to create harvestable zones in the province where it is known that suitable sea

urchins lie. Also, a rotation system needs to be put in place whereby fishers could only harvest from designated zones during approved times. Again, conservation of the resource is paramount here, as it would give sea urchins a chance to reproduce, mature and replenish in these determined zones. This is essential to an established sea urchin fishery, as it is a known fact among both scientists and harvesters that sea urchins require up to seven years to mature to a harvestable level. The use of this knowledge on the part of fishers to set up these zones would also aid in limiting the numbers of licenses being granted and numbers of divers becoming involved in the fishery. Sea urchin fishing would not be an open access resource. It would be controlled, monitored, and thus successful in this respect.

As well, by incorporating these zones as suggested above, fishers could use knowledge attained from participating in other fisheries. Many who work as sea urchin harvesters in the autumn and winter seasons also work in other fishing industries during the spring and summer months, such as crab and lobster fishing. Knowledge of bottom depths and even the presence of sea urchins can be attained through these other fisheries, as urchins are often inadvertently caught in traps and pots set for crab and lobster. This information needs to be recorded and considered when creating policy for a sea urchin fishery.

Since the fall of the Newfoundland cod fishery in 1992, the policy of fisheries departments, both provincially and federally, has been to recreate an

industry that is professional in nature and not without entry restrictions, as it was with the cod fishery in the years prior to the moratorium. The wealth of knowledge held by those who have taken part in the exploratory sea urchin fishery allow for the potential creation of a very professional industry. Training courses need to be coordinated by those with both vernacular and scientific knowledge whereby those entering the industry get access to firsthand knowledge regarding optimum harvesting techniques and conditions, in addition to safety issues pertaining to the industry.

The utilization of this vernacular knowledge on the part of fisheries departments would do much to further empower sea urchin fishers. As has been illustrated throughout this study, the focus group of this work already feels a sense of autonomy as they consider themselves the foremost knowledge stakeholders in their industry. Again, they do not consider fisheries departments, either provincially or federally, to be in tune with the resource or the fishery. Official recognition of their knowledge and status within the industry would prove to further increase their sense of empowerment and autonomy. Also, making local fishers recognized managers in their own fishery would do much in terms of preserving the resource. Individuals are less likely to bend or break regulations over the proper running of a resource industry when they see themselves as stakeholders within that industry. Also, as fisheries surveillance funds continue to be cut by governments, the ability to police and manage local fisheries by local fishers can only further aid in the conservation process.

7.2 Suggestions for Further Research

As with any study, the focus here is limited. Potential for other areas of research pertaining to the new fisheries in Newfoundland and Labrador is vast. A comparison between the sea urchin fishery and other fisheries of underutilized species might be conducted in an effort to identify the potential of the participants in possible management schemes. Because fisheries for underutilized species tend to be experimental and exploratory, they are often in a stage of infancy in terms of policy making. Hence, there are great prospects for the active input of these fishers in terms of integrating vernacular knowledge with that of scientific knowledge as governments develop these industries. This study could inform those involved in the management and process of fishing underutilized species in order to determine the most effective roles for various types of knowledge to provide maximum economic gain for individual and state, while maintaining the ecological integrity of our natural resources. In the same vein, sea urchin fishing could be compared to the current state of the crab and shrimp industries, which are now experiencing both a boom in production as well as a forewarning of potential future shortages. Using the case study of the failure of the cod fishery, in combination with the potential success of the sea urchin fishery, other currently popular species such as crab and shrimp may also benefit.

This thesis has also examined sea urchin harvesters as a folk group. A more broad comparison may be made with the most conventionally prevalent

fishing folk group in Newfoundland and Labrador, cod fishers, so that a direct comparison may be made in terms of safety, narrative, identity and community created through shared experience. Another direct comparison would be that between urchin divers and other commercial diving occupations, whose purpose may be different, but who still face the same dangers and concerns of urchin fishers.

Perhaps a significant discussion absent from this study is the role of women in the sea urchin fishery. While it is widely acknowledged that women played a large and integral role in traditional fisheries in Newfoundland and Labrador, namely the cod industry, their role in urchin harvesting would be limited to plant processing workers. No women were involved in the group of divers studied here, and the group knew of no women who worked as sea urchin harvesters in the province of Newfoundland and Labrador at the time of this writing. The work of divers has been privileged over that of plant workers here, which is one reason why a discussion of gender is lacking. Including such employees would then bring about a discussion of gender divisions in labour practices related to the urchin fishery as a whole. Perhaps the fact that women are a largely absent group from this particular industry is a complete study on its own.

7.3 Conclusions

When I embarked upon this study in 1998, I had set objectives in terms of the information I wished to glean from studying this folk group. Because I had worked myself as a sea urchin harvester, my emic status within the group assisted in terms of understanding the industry, gaining confidence of informants, and ease of documentation. As I delved further into my research and fieldwork, I was surprised at the undercurrents that ran deep beneath the surface of my work. In order to appreciate the present state of a new fishery, I had to venture to the past to understand the failures of others. What I have ultimately concluded, through my analysis of the cod fishery, is that knowledge – recognized – is power. As a result, I now understand where this image of powerlessness I first witnessed in 1992 originated from. Knowledge was not recognized. The sea urchin fishery, in its current state of early development, is not as regimented as the former cod fishery was. Because of this, fishers in the industry are beyond the legislators in terms of what is known of the resource in Newfoundland and Labrador. Because they are the current authorities, sea urchin fishers are experiencing a sense of power that their predecessors in the cod fishery, who operated under the jurisdiction of the federal Department of Fisheries and Oceans, never had. Whether this sense of power will remain once formal authorities formulate policy on the sea urchin fishery in Newfoundland and Labrador is yet to be seen.

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Appendix I: Breakdown of Canada's Population, 2001-2003

(Canada Demographic Statistics)

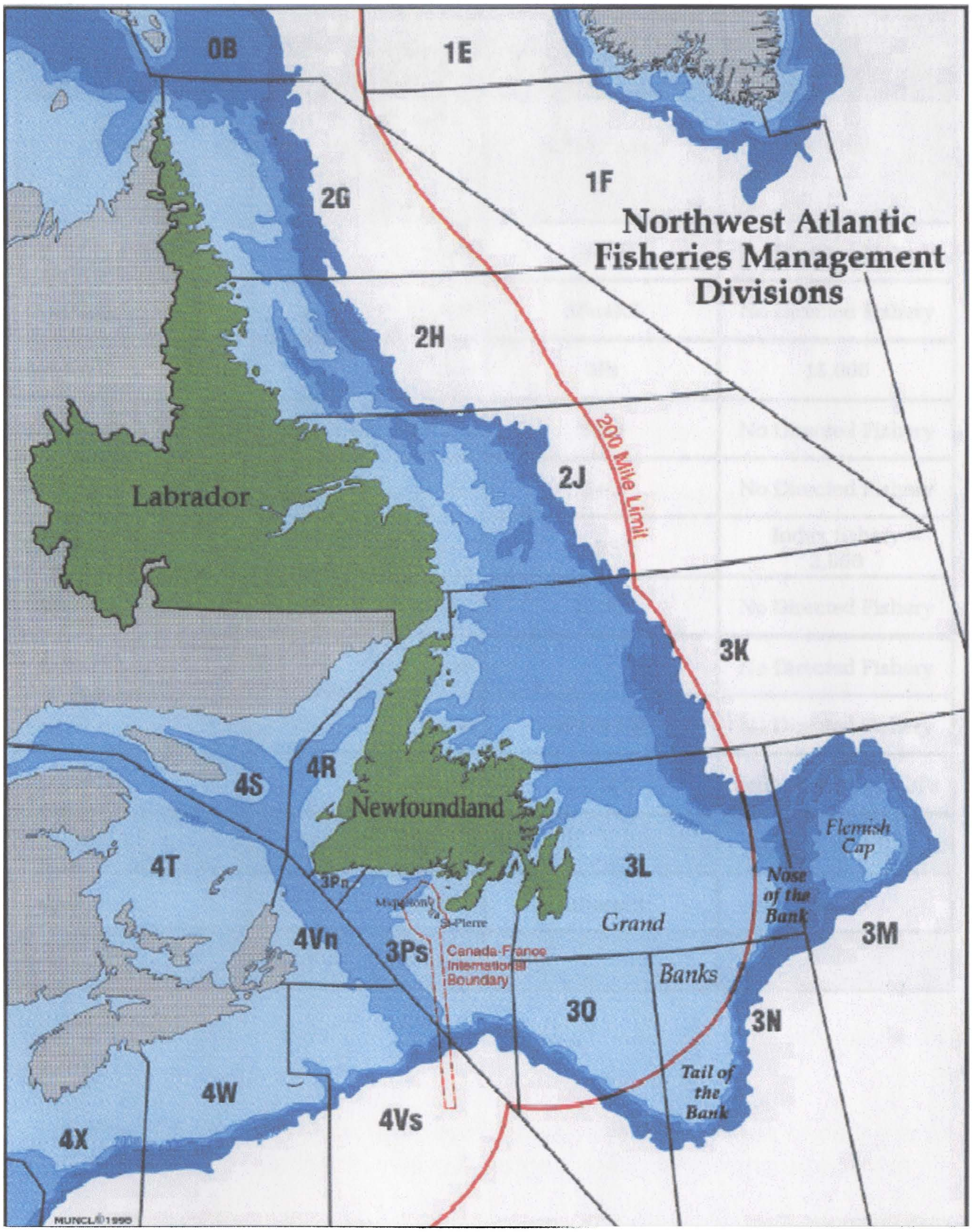
Canada's population

	January 1, 2001[pr]	January 1, 2002[pr]	January 1, 2003[pp]	2001 to 2002	2002 to 2003
				%	
Canada	**30,921,275**	**31,240,487**	**31,499,560**	**1.0**	**0.8**
Newfoundland and Labrador	536,344	533,305	531,145	-0.6	-0.4
Prince Edward Island	138,434	139,330	140,412	0.6	0.8
Nova Scotia	943,025	943,756	944,456	0.1	0.1
New Brunswick	755,360	755,391	756,368	0.0	0.1
Quebec	7,395,952	7,435,504	7,467,626	0.5	0.4
Ontario	11,777,260	11,964,104	12,109,514	1.6	1.2
Manitoba	1,146,975	1,148,181	1,150,564	0.1	0.2
Saskatchewan	1,019,466	1,014,403	1,009,225	-0.5	-0.5
Alberta	3,032,355	3,086,034	3,134,286	1.8	1.6
British Columbia	4,077,047	4,120,891	4,155,779	1.1	0.8
Yukon	30,243	30,102	29,841	-0.5	-0.9
Northwest Territories	41,018	41,186	41,389	0.4	0.5
Nunavut	27,796	28,300	28,955	1.8	2.3

pr	Updated postcensal estimates.
pp	Preliminary postcensal estimates.
Note:	These estimates are based on the 1996 census counts adjusted for net undercoverage.

Appendix II: Northwest Atlantic Fisheries Management Divisions

(White Paper 59)



Appendix III: Fisheries Under Moratoria or Declining

(White Paper 7)

Summary of Major Fisheries Under Moratoria or Declining in Waters Adjacent to Newfoundland and Labrador			
Species	**Average Annual Catches 1981-1990 (tonnes)**	**NAFO Area**	**Status**
Northern Cod	214,000	2J3KL	No Directed Fishery
Gulf Cod	82,000	3Pn4RS	No Directed Fishery
3Ps Cod	42,500	3Ps	15,000
3NO Cod	35,000	3NO	No Directed Fishery
Redfish	17,000	2+3	No Directed Fishery
Gulf Redfish	25,000	4RS	Index fishery 2,000
American Plaice	40,000	3LNO	No Directed Fishery
Witch Flounder	8,500		No Directed Fishery
Haddock	9,600	3Ps/3LNO	No Directed Fishery
Snow Crab		2J, 3PS	Reductions in 2J, 3Ps
Subtotal	473,600		
Capelin	60,000	Adjacent	30,000
Total	**533,600**		

Appendix IV: Glossary of SCUBA Terms

backpack: Designed to securely and comfortably hold a tank on a diver's back.

BCD: Buoyancy Control Device *buoyancy compensator* - an inflatable vest worn by the diver that can be automatically or orally inflated to help control buoyancy; abbreviated BC.

bottom time: variable definition; in square wave diving, the time between descending below the surface to the beginning of ascent. In multi-level diving, the time between descending below the surface and beginning the safety stop. (Other definitions may apply depending on the specific type of diving.)

buddy: It's always strongly advised that you don't dive alone. Part of the dive procedure is finding a good buddy to dive with you.

decompression sickness: A painful and potentially fatal malady an environment of high pressure to one of lower pressure, commonly known as “the bends”.

depth gauge: A device that indicates how far a diver is below the surface of the water.

dive tables: A printed collection of dive times for specific depths, by which the diver can avoid contracting DCS.

dry suit: A water-tight garment that keeps the diver's body warm by providing insulation with a layer of gas, such as air; for diving in waters that are too cold for comfortable wetsuit protection, usually below 65°F.

equalize: If you've ever held your breath and dove down, you may have noticed that you feel pressure in your ears. The same thing happens when you scuba dive. If you do nothing, it can get very painful. You equalize by closing your nose and blowing as you dive deeper. Your ears will automatically pop when you come back up.

first stage regulator: Regulator attached to the scuba tank that lowers the tank pressure to ambient pressure + a pre-determined pressure (e.g., ambient + 140 psi).

free diving: Also known as “breath hold diving”, this is a method of diving where a diver simply holds her breath and submerges, using little or no equipment.

giant stride entry: You put on all your scuba gear, waddle to the edge of the dock, and take a giant stride into the water!

hoods: Garment worn over the head to reduce thermal loss.

hookah: A surface-supplied compressed air apparatus, for use in shallow diving in calm waters. The air is delivered to one or more divers through a long hose.

intake valve: Valve located on the chest area of a dry suit whereby oxygen is drawn into the suit for purposes of buoyancy.

lift bag: After being tied to an object to be lifted, the bag is inflated and will start to rise.

logbook: A diary of a divers dive history. Provides evidence of the depth and breadth of a divers experience.

mask squeeze: Occurs in rapid descents where the diver neglects to equalize his/her mask. The increase pressure causes tissues around the eyes to swell.

octopus: An extra breathing second stage for use in the event of a failure or an out-of-gas emergency with a diving buddy. They are usually coloured yellow.

psi: Pounds per square inch; a common measurement of air pressure.

regulator: In scuba, any device which changes air pressure from one level to a lower level.

snorkel: A hollow tube swimmers or divers can breathe through when they are close to the surface.

weights: Lead weights that make you sink. This, along with your BC, allows you to control your buoyancy.

wet suit: Any suit that provides thermal protection in or under water by trapping a layer of water between the diver's skin and the suit.