Newfoundland and Labrador Fish Harvesters' Perceptions of Risk

By

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Introduction

The main objective of this component of SafeCatch was to document harvesters' experiences with risky situations; their perceptions of fishery risks; as well as their perceptions about the ways safety training, regulatory and other changes introduced to the Newfoundland and Labrador fishery have influenced risk. We focus on the period of substantial environmental, industrial and regulatory change between 1992 and 2004. Our "Perceptions of Risk" (POR) component provides information that is vital to interpreting data captured in other components, including insights into the relationship between reporting and actual experience with accidents and near-misses (relevant to the FVSLA component). It builds into the overall project information from harvesters regarding how they assess and respond to risk and regulatory and other changes within fisheries with potential consequences for their health and safety. It also identifies sources of risk that are largely invisible within most fisheries research. Finally, we are able to offer some insight into the things harvesters do to try to reduce risk – an under-researched area of fishing safety with potentially significant policy implications.

Fish Harvesters' Perceptions of Risk

The complex changes that have occurred in the Newfoundland and Labrador fishery since 1990 and the limitations in existing administrative data (i.e., the problem of under-reporting) make it very difficult to document, interpret and fully explain the causal mechanisms influencing the risk of accident, SAR incident, injuries and fatalities in the Newfoundland fishery. Fish harvesters work at the point of interaction between all of these changes, and their attitudes and actions play a critical role in shaping what happens, why and with what consequences for harvesters, vessels, harvester organizations and SAR incidents and outcomes. They also have important insights into the sources of risk and have developed their own strategies for reducing perceived risk in fisheries that can contribute to larger discussions and investigations of these issues.

Most existing research on perceptions of risk has concentrated on gaps between perceived and real risks among harvesters (Murray, 1997; Poggie and Pollnac, 1997). Previous research carried out in the 1980s (Binkley, 1995; Neis and Ripley 1990) concentrated on the offshore groundfish and scallop dragging sectors finding high rates of accidents, injuries and fatalities, and a relationship between increased back injuries and the shift to boxing fish on board large draggers. Normalization of injury, fatalism and denial of risk were also key findings. Research in the early 1990s on the inshore sector (Murray and Dolomount, 1994, 1995) found high levels of anxiety among harvesters. SAR research released in 2000 pointed to a pattern of under-reporting mishaps and injuries to SAR and to workers' compensation.

The Perceptions of Risk component explores gaps between perceived and real risks among fish harvesters but our main focus is on gathering harvesters' observations and knowledge in order to deepen our understanding of risks, their origins and how they interact with fish harvesters' knowledge and practice to influence decision-making and ultimately safety and health within our fisheries. Our approach assumes that all

knowledge (lay and expert) is social-ecological knowledge in that it reflects the social and environmental position of the knower. From our perspective there is no single, objective place from which to assess risk and the best way to assess and minimize risk is through interdisciplinary and intersectoral approaches, seeking input from a variety of different knowledge agents focusing on different sources and dimensions of risk and using multiple methodologies. Fish harvesters' experiences on the water, their "positionality" (Fox 1998), inform their observations and interpretations to risk assessment, which may differ from those of scientists and other experts. Inclusion of fish harvesters' safety knowledge in research on risk is particularly important in the context of rapid change and as a means to promote understanding and awareness among those with an interest in minimizing risk through co-management of safety including harvesters, safety experts and policy–makers. We have sought to take into account social and cultural factors that can influence risk and perceptions of risk such as safety training and practices while also seeking harvesters' practical, experience-based knowledge and insights about risks, their origins and about ways to mitigate or reduce those risks.

Ethics and Methods

Ethical approval for this research was provided by the Human Investigations Committee at Memorial University and the Human Research Ethics Board at Dalhousie. We used a mixed methods approach because this provides the opportunity to triangulate findings (look for support for a finding across methods) and to compensate for the weaknesses in individual types of data collection. Our three methods include: focus groups, a phone survey, and boat tours.

Focus Group Method:

Recruitment to the focus groups began with a list of names of fish harvesters involved in professionalisation, many of whom instructed safety courses in different areas of the Island, provided by the Professional Fish Harvesters Certification Board (PFHCB). We contacted these fish harvesters and they provided names and contact information for harvesters in their areas who they thought would be interested in participating. The latter were contacted and those we were able to reach were invited to participate in a focus group in their area. Focus groups took place between March 2003 and December 2004. Sessions lasted between 2.5 and 3 hours. Participants were asked to complete a voluntary, short, self-administered demographic questionnaire. Focus group sessions followed an agenda of discussion topics that were distributed to participants at the start of the focus group. Sessions were audio-taped, transcribed and transcripts were analysed using QSR N6 qualitative software.

A total of 17 focus groups were completed involving 94 fish harvesters (83 men and 11 women) from the island portion of the province. The disproportionate number of men reflects the gendered structure of the harvesting sector (Grzetic 2004). Participants ranged in age from 23 to 65 years and the average age was 44 years. The average age when participants had started fishing commercially was 20 years but was much higher for

women at 31 years. These harvesters were predominantly from the under 35 foot and 35-65 foot sectors. Snow crab, groundfish, herring, and lobster were the most widely reported species fished by participants. Sixty-eight harvesters reported current involvement in the inshore fishery and 44 in the longliner fishery. Seventy-one respondents had taken formal fishery training courses. At least 65 were skippers, and 68 reported having core status. In terms of professionalisation designations, 64 identified as Level II, five as Level I, and five as Apprentice. Among the 11 women participants only one had core status and only four had Level II status. Eight-seven harvesters were married or living common-law and 51 fished with their spouse or common-law partner. Ninety-one participants had children. Only 11 said they would encourage their children to enter the fishery.

Telephone Survey Method

Phase Two of the Perceptions of Risk component consisted of a phone survey involving professional fish harvesters. The phone survey was developed drawing on insights from the focus groups and on survey questionnaires used in earlier, similar research on fish harvesters' perceptions of risk. Survey questions asked harvesters about where they fish, their vessel, gear, and the species they fished for in 2004. Questions also inquired about accidents and injuries harvesters have experienced, about things they think might affect fishing safety, about safety training and equipment. A few questions discussed their general income level, quality of life, and health status.

The survey instrument was pre-tested and adjusted and was shortened after each pre-test. Our original goal was to survey a random sample of 100 professional fish harvesters stratified on the basis of region and on the basis of level of professional certification. To find our sample, we asked the PFHCB to generate a stratified random sample of 600 names from its list of professional fish harvesters. In the spring of 2005, the PFHCB mailed a package of information to each of these individuals containing information about the study, a letter of support from the PFHCB, a contact reply form and a stamped, self-addressed envelope for those interested in participating. We received only 35 responses to this initial mail-out and, from these, were able to complete 25 phone interviews. We attribute the low response rate to this initial request to turmoil in the industry that erupted in the snow crab fishery around the time of the mailout, and to the fact that the mailout took place after many harvesters were back fishing.

We attempted to increase our response rate for the survey by asking the PFHCB to send a second package of information to the same participants in September. We received 19 responses to this second mail-out and, from these, managed to complete 15 interviews. We also discussed the research during a radio interview with the host of the Canadian Broadcasting Corporation's *Fisheries Broadcast* during which we issued an invitation to harvesters to participate. This advertisement generated an additional three responses (calls to a secure, toll free line) and to the return of one more contact reply form from our original sample. In light of the overall low response rate to these multiple initiatives, we revisited the last few pre-test interviews we had conducted using a version of the survey instrument that was very close to the final version and, with the permission of three

individuals, re-classified their interviews from pre-test to test interviews. Thus, our total number of completed surveys for this component is 46. This is not a large enough sample to generalize to the harvester population, but these lengthy surveys have provided a very important source of additional information for this component.

The fish harvesters we surveyed started fishing between the ages of 10 and 32 years (average of 16.8 years), and they ranged in age from 22 to 67 years (average of 47.4). Years fishing ranged: 4 had fished 15 years or less; 18 had fished between 15 and 29 years; and, 24 had fished for 30 years or longer. Forty-one percent of those surveyed had not graduated from high school. All 46 had received some formal training related to fishing ranging from a Basic Safety Training course to qualifications in Marine Engineering or Marine Diesel Mechanics. Sixty-seven per cent of fish harvesters surveyed worked in the less than 35' sector and 32 had Core status. Of the harvesters interviewed, 27 were skippers and the rest crew.

Boat Tour Method

The boat tours took place on harvesters' vessels and combined qualitative interviews, with demonstrations, observation and a mapping exercise. During the boat tours harvesters were asked to identify the location of risky activities on the vessel and then to describe and, where possible, re-enact their strategies for dealing with them. Using a generic diagram of a vessel deck, participants were asked to add details to the generic diagram to make it match their workspace and to identify on the diagram places or tasks they perceive to be risky or dangerous. The map serves as a visual representation of perceived workplace risk and was also used to illustrate steps they took to reduce risk. This mapping tool is adapted from a research approach developed for industrial OHS environments.[1] We completed seven boat tours, four on vessels under 35 feet in length and three on vessels measuring between 35 and 65 feet.

Triangulation

The focus groups allowed us to collect information related to the broad theme of fishing risk. This information provides valuable insights into the safety-related aspects of changes in fishing over the past decade. Focus group discussions can trigger ideas and information that might be overlooked or forgotten in one-on-one interviews but these data lack the depth of experience and information that can be derived from detailed one-on-one interviews. The semi-public nature of focus groups also means some individuals will not speak openly about certain kinds of concerns or events. This is perhaps particularly true for crew. We used our focus group data in the design of the survey questionnaire. The survey method does a good job of testing verbal, formal knowledge and allowed us to increase the randomness of our sampling and to conduct surveys in areas where we were not able to hold focus groups. Surveys are not designed, however to explore experiential and embodied dimensions of work and risk and the low response rate (approximately 13%) to the mail-out means that our respondents are not a representative

[1] Thanks to Dorothy Wigmore for introducing Nicole Power to this methodology and to Dwayne White for designing the generic map of a fishing vessel deck used in the boat tours.

sample of the harvester population limiting the generalizability of these findings. One of the goals of the boat tours was to move from a discussion organized mainly around perceived risks to one that included the strategies used by skippers and captains to keep themselves and their crew safe. We focused our attention not so much on the security or stability of the vessel as on the vessel as a job site or work platform. The boat tours moved safety and risk discussions on to vessels and provided the opportunity for harvesters to act out certain activities and to map sources of risk as well as strategies for dealing with them thereby opening up new opportunities for discussion and exploration and reducing the risk of misunderstanding on the part of the researcher.

Results and Discussion

In the focus groups, participants described a wide range of accidents, injuries, risky situations and near-misses they had experienced or observed. Risky situations included fishing in rough or changing weather, unreliable forecasting, and fishing in cold weather. They also included situations where overloaded boats, especially in the lobster fishery, had led to capsizing and swamping. Crossing shipping lanes was associated with the risk of collision and some near-misses were discussed. Many small boats did not have radar during the early years of the under 35 foot crab fishery. Shooting crab pots, dealing with loose rope and fishing for crab in small, open boats were also discussed. Focus group participants described situations where they had dealt with equipment failure, engine failure and the failure of navigation technologies. Fishing alone or with a reduced crew was associated with risk as were fishing too close to shore (in the lobster fishery), fishing far from shore, fishing in ice, and sealing in the fog. They described ice damaged vessels that began taking on water, grounding, collisions, falls into the hold, getting tangled in rope, falling overboard, slips, and tripping. Rope around the propeller and gear snagging on the bottom or on other gear increased the risk of swamping and breaking the hauler. The types of injuries described in focus groups included getting “squat” in machinery, breaking and losing fingers in equipment and rope, and breaking arms and legs.

Phone survey participants were asked if they had been in certain risky situations in the past ten years. As indicated in Figure One, a large percentage of the sample had experienced “being onboard in extreme weather,” “being towed in,” “being onboard when the engine failed,” and “being onboard when the navigation failed.” None had been forced to abandon ship or experienced a collision.

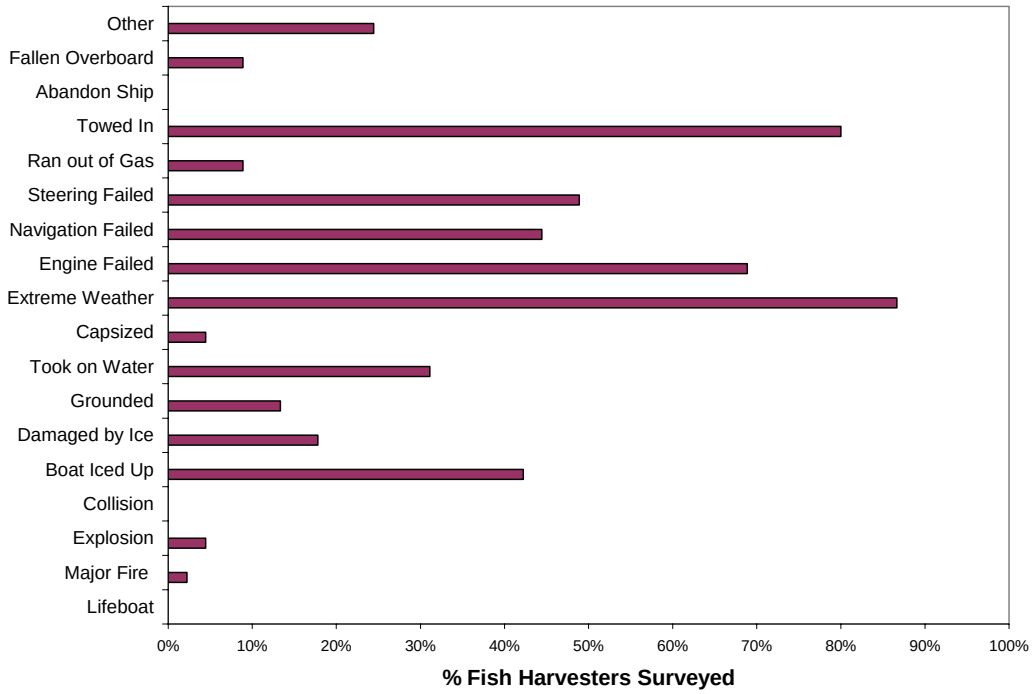

Figure 1. Risky situations experienced by surveyed harvesters in Newfoundland and Labrador.

Exactly 50 percent (23) of those surveyed in the phone interviews reported having an accident in the past 10 years and 44 percent said they have health problems that are related to fishing. Of the 23 harvesters who reported having an accident, 14 of those described experiencing injuries. Slips, trips, and cuts accounted for approximately 48 percent of these accidents; only one participant said he had fallen overboard in the past ten years. Eleven injuries were rated "moderate" or "serious," but 13 required treatment at a hospital or by a doctor suggesting more were actually quite serious. Some injuries were simply dealt with on board. Thus, of 18 harvesters who described a fishing accident, 11 indicated that the vessel went on fishing afterwards while only seven indicated the vessel had returned to port.

Harvesters tend to see some injuries as part of the job. In the words of one harvester, "That's the nature of fishing anyway. You're not going to get clear of all risk at fishing." Phone survey participants were asked if there are certain types of injuries that are a common or normal part of fishing and, if so, what are some of these types of injuries. Forty-three percent (20) of respondents listed "back problems", 37 percent (17) "slips and falls" and 37 percent (17) "cuts" in response to this question. This tendency to normalize injury may reflect real pressures to keep fishing even when seriously injured in highly seasonal fisheries where harvests from a short period will dictate annual income. For example, one focus group participant described becoming tangled in rope and injuring his foot when his hydraulic hauler failed. This did not stop him from fishing the rest of the season. "I had my foot tore up; yeah, an uncomfortable summer fishing." Only five of the 14 injuries reported in the phone survey resulted in a claim to the Workplace Health Safety and Compensation Commission (WHSCC).

When surveyed harvesters were asked: “From your point of view, what are the three things that have the most effect on fishing safety?” the most common answers were: government regulations, weather, and training/knowledge. Harvesters considered the most dangerous situations at sea to be associated with weather-related factors (bad weather, poor forecasts), vessel size factors (including stability and overloading), and problems with or lack of equipment.

Harvesters tend to normalize the risks to safety posed by bad weather. However, they also see weather risks as mediated by forecasting, experience with the vessel and with different types of conditions, and by regulations. Changes in fishing areas can mean exposure to new weather-driven situations and can create experience gaps. Changes in access to timely and accurate forecasts also mediate risk. In March of 2003, the weather forecasting station in Gander was closed and all forecasters were moved to Halifax. Those surveyed commonly agreed that local forecasts do not seem to be as accurate as they were in the past when forecasts were done from Gander. Seventy per cent of phone survey participants thought the quality of the forecast had declined over the last two years. Those who did not share this view tend to fish on larger vessels and to have access to more sophisticated technologies that enable them to directly access weather forecasts from elsewhere. One harvester commented that with appropriate meteorological information and radar maps, an accurate forecast can be given from Australia for fishing grounds in Newfoundland. Thus opinion was divided on the effects of the closure of the Gander office but most identified the closure with a decrease in forecasting quality.

Regulations can both mitigate and enhance risk. The regulations they think matter most to risk include those that limit vessel length, set season lengths, that include strict rules about when gear can be in the water, and that require mandatory safety equipment and training. We began the boat tours by asking participating skippers to describe their ideal vessels. In response, fish harvesters indicated a preference for larger vessels, provided regulations and costs were not factors. They described the main advantages of a larger vessel as including increased deck space for working, improved safety when traveling offshore, and as allowing for the addition of amenities that increased the crew’s comfort during longer trips (such as a galley and toilet facilities).

Competitive fisheries like the lobster fishery are associated with a rush at the beginning of the season to set pots and secure key grounds. To alleviate this pressure, DFO has extended the time for setting lobster pots from 24 to 48 hours prior to season opening. However, local competition can still work to encourage risk-taking, particularly in the context of economic pressures, limited options, and depleted lobster stocks common to some areas. The risks most commonly associated with this fishery include: overloading the boat when setting, moving or retrieving pots; swamping the boat; the risk of entanglement in mechanical haulers used to haul pots; and the risk of entanglement in rope. In the latter part of the season, lobster fishing takes place very close to shore opening up the risk of coming up on the rocks. Mechanical haulers are now common in the lobster fishery and pose different risks from manual hauling. The collapse of the cod stocks was associated with intensified fishing effort in the lobster fishery. Increased effort

and competition for dwindling lobster resources have contributed to competition and risk-taking, particularly in some areas like St. John Bay (Whelan 2005).

Over the past decade, individual quotas (IQs) have been introduced into many fisheries including those for snow crab and cod. Harvesters generally reported that IQs have reduced pressures to fish in bad weather and to take other chances related to the race for the fish associated with competitive fisheries. However, they also indicated that the IQ safety dividend can be compromised where declining stocks, management initiatives that unexpectedly shorten the season like the recent provincial government Raw Material Sharing program, or other unanticipated changes in season length or overall quota size undermine the harvesters' ability to choose when they fish. Financial pressures and community norms that encourage competition may also undermine the IQ safety dividend.

Some other recent conservation and management initiatives include the requirement for dock side monitoring and related constraints on where catches can be landed; the requirement, in some fisheries, for on board observers; regulations with specific dates for setting and retrieval of gear including weekend retrieval in some cases. These regulations can contribute to risk because, in the words of one harvester: "We're forced out on the water when we shouldn't be out there." Risk increases when harvesters are fatigued as can happen in contexts encouraging work intensification as a result of management strategies that condense annual fishing time to shorter periods, with seasons for different species overlapping, and where harvesters are fishing from ports that are a long way from their homes adding commuting times.

Some phone survey participants wanted more regulation in the seal hunt with several suggesting that individual quotas are needed to reduce competition and associated risk-taking. When asked if there is one fishery that they consider especially dangerous, 24 percent (11) survey respondents talked about sealing. One former sealer noted "a bullet can go a long way" on the ice, echoing the concerns of others about the use of high-powered rifles. Other dangerous aspects of sealing include walking on and maneuvering a vessel in the ice: "[when you are on the ice] you're in God's pocket." This comment reflects the harvesters' awareness that they lack control over risk when fishing in ice. Focus group participants who had participated in the seal hunt identified a similar range of risks including working in icy conditions, the use of guns, lack of regulation within the fishery and fishing in boats ill-equipped for this fishery.

New Fisheries, New Risks: Turning experienced into inexperienced harvesters

> Like in our sector we were always like inshore, so we knew just to steer away from someone, small boat, right? But out there, they're not stopping. If they've got the right of way, they're keeping on trucking, right … something that we weren't used to first when we start moving off farther.

Many of the harvesters who participated in the focus groups entered new fisheries in the 1990s. Those who began snow crab fishing after all core enterprises became eligible for

seasonal temporary permits in 1996 fished for crab much further offshore than they had in the past, using different technologies. Those with a longer history in the snow crab fishery also experienced important changes as they were pushed further offshore (up to 200 miles) when the closer grounds were turned over to the small boat sector.

Study participants often described fishing for crab in inappropriate vessels and without vital equipment such as radar and survival suits during the early years of the temporary permit snow crab fishery. Most were "experienced" harvesters with many years on the water, but their experience and vessels were tied to particular fisheries and to coastal locations. As they moved offshore and into this new fishery, they discovered new challenges and risks. To illustrate and as indicated in our opening quote, skippers of small boats fishing close to shore took responsibility for avoiding each other and had rules for this. In the offshore, particularly in areas where they had to cross major shipping lanes to get to their grounds, the situation was different. Large vessels like tankers and container ships expect small boats to stay out of their way. When traveling to their crab grounds and sometimes when fishing in shipping lanes they need radar to avoid getting run down and improved navigation technologies so they know when they were entering, leaving and, in some cases, fishing in shipping lanes. The volume of gear required for crab fishing, distance to the grounds and the need for mechanical haulers also pose new challenges for harvesters. During the early days of this fishery, some added crab haulers to small, aluminum open boats increasing the risk of swamping their vessels.

Since the beginning of the small boat crab fishery, many harvesters appear to have adjusted their vessels and equipment to better suit the risks associated with snow crab fishing. However, serious challenges persist. The risk of gear entanglement is a major safety challenge for many harvesters in the under 65 foot snow crab fishery. This risk is associated with the combination of cramped deck space and the high volumes of rope and gear required for this deep water fishery. Power and Brennan used their boat tours with skippers to deepen our understanding of the nature of this risk and skippers' strategies for dealing with it. In crab harvesting, crab pots are attached to a main line at intervals of 15-20 fathoms. There are often 50-75 pots on a line with buoy lines connected to the main line at each end, along with staff buoys. Each string or fleet of pots includes 1-1.5 miles of rope and boats often carry multiple strings of pots (200-600 pots and miles of rope) when setting, moving and retrieving gear. Setting, hauling and transporting pots means dealing with rope. When setting, harvesters run the risk of becoming tangled in the rope (losing limbs) and being dragged overboard.

Harvesters have sought to mitigate the risk of entanglement in a variety of ways. At a structural level, they have sought to maximize the deck space available but their ability to do that is limited by the cost and by vessel length and volume limits outlined in the Department of Fisheries and Oceans' vessel replacement regulations. Strategies for reconciling the demand for space with these constraints have included the purchase of longer vessels which are then shortened, widened and deepened, and moving the wheelhouse to the bow. Despite these structural modifications, they end up with extremely limited deck space and miles of rope to manage as they stand on a moving and often wet and slippery platform trying to carry out their work.

Further efforts to limit risk associated with the management of rope in this environment vary from vessel to vessel. Some try to minimize the movement of the gear and rope and to control the pathways through which the rope flows. They do this by striving to shoot in calm weather, keeping stacks of pots low and tied down, putting carpet and non-skid paint on their decks to minimize the risk of slipping, and trying to keep their deck clean and tidy. Buoy lines and main lines are stored by the side of the wheelhouse or pounded off. Some manipulate their shooting speed and limit shooting to daylight hours. Skippers ensure that only the crew required to shoot the pots are on the deck at that time and some hire crew whose job it is to watch the moving rope. They instruct crew to minimize the movement of their feet on the deck by supporting their back with their legs, bracing their legs against the deck, gunnel or railing and keeping their feet on the deck so the rope won't go around them. Crew members tend to do the same job all the time and new crew are assigned to easier, safer jobs. The shooter (or the captain) stays close to the hydraulic controls in case something goes wrong and a knife for cutting the rope is stored near the pot shooter. One way to minimize crew movement and hence risk is to set up an assembly line for shooting in which one worker takes a pot from the stack, baits it, rolls it to another, who then passes it to a third to shoot off the gunnel (See Figure 2.).

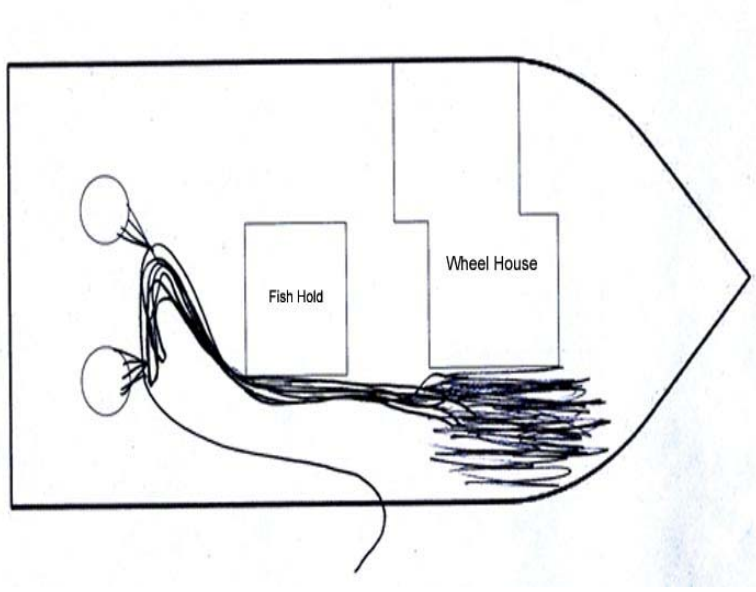

Figure 2. Composite diagram of rope management to reduce risk of entanglement taken from boat tour maps.

Common Sense, Safety Training and Safety Equipment

Harvesters described their strategies for dealing with rope and injury prevention more generally as using "common sense" and commonly attributed incidents involving rope and accidents to "carelessness", that is, not being cautious, aware and alert. Examples of carelessness discussed by participants include: fishing in rough weather; not getting enough sleep; fishing while not well; and being distracted by family or other worries.

“Using common sense” involves applying direct and indirect experience and using judgment. Common sense management of rope and of the vessel overall is mediated by larger, contextual factors such as environmental conditions, regulations, social pressures and cultural practices.

Since the early 1990s, there has been more attention to safety training in the media and in fish harvester organizations. The focus group and the survey data suggest a tension between experiential approaches to fishing safety and reliance on formal safety training. This tension was mediated by age and experience, with older fishers less likely to place a lot of importance on training than younger harvesters (see Figure 3.). They were sometimes unlikely to see the value of training for themselves but more accepting of its value for young people. Older fish harvesters learned about fishing and fishing safety through mentorship and through experience on the water. In the survey, they tended to rate the importance of safety training and equipment lower than experience and “common sense” in terms of their relevance for reducing risk. An older focus group participant commented: “And I, assuming I know everything that’s … needed to know through experience over the number of years you’ve been in it, 20 years you’ve been in it, you’ve learned it all.” Most (including younger harvesters with formal training) recognised inexperience as a risk factor in near-misses, accidents and injuries.

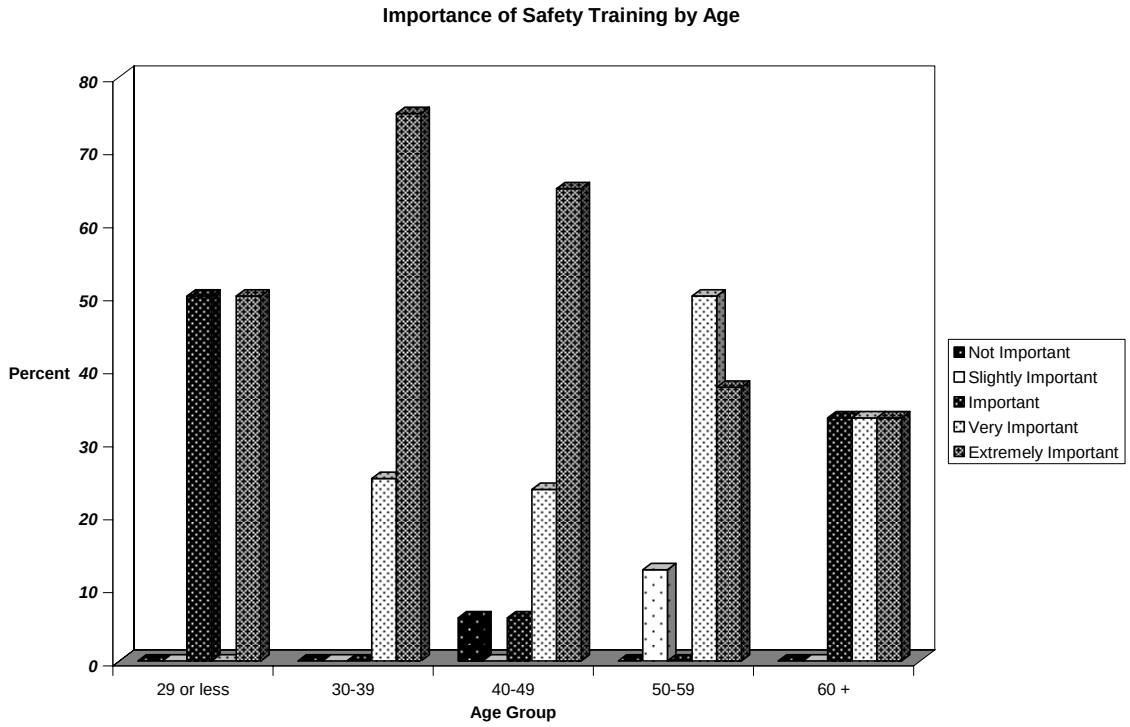

Figure 3. Importance of Safety Training by Age of Phone Survey Respondent.

Some harvesters felt increased seasonality, as well as changes in crew recruitment and turnover patterns had increased the need for formal safety training among younger harvesters.

> [T]alking about safety. All these fellas are fishing all their lives. Maybe they don't need to do courses as much as me or young people in the fishery. But I may fish two months of the year or whatever, coming up through all the time, and we don't know, we need to do safety courses, I think. I mean learn how to even set crab pots and set... new people in the fishery coming in to watch out for the risks. The young people my age don't know nothing about the fishery.

As has been found in other research, harvesters commented that safety training tends to change harvesters' perceptions of risk by increasing their awareness of particular kinds of risks, especially those related to the use of technologies, vessel stability, navigation, and liability. As indicated by one focus group participant, "The safety courses, like they open your eyes to a lot of stuff that you never seen before. You got to laugh at a scatter thing that they're showing you, but you walk away with something." Only four of our phone survey participants had done no safety courses (Lifeline, BST, MED). These four generally ranked the importance of safety training lower than the majority who had done some training. However, the sample is small and it is possible that this attitudinal difference preceded the safety training experience.

Respondents also indicated that harvesters tend to follow the example of others when deciding whether to invest in more safety equipment: "Like a few years ago you'd hardly ever see a fisherman wearing a life jacket or life jackets aboard a boat. One guy starts getting them and putting them aboard the boat the other guy gets them. It's like VHF radios, life rafts and flares and what not. You know everybody now is starting... if one gets it then the other guys says well he got it, he got it for a reason, I'm going to get one."

During the boat tours we asked the question: "How do you stay safe while fishing?" Harvesters' responses highlighted a tension between a regulatory focus on survival equipment and training and their focus on the daily requirements of fishing work. While harvesters generally positively assessed classroom-based survival training (although not always for themselves), and saw the value of navigation, communication and life-saving equipment, they also pointed to the importance of experience in knowing how to fish safely on a day-to-day basis. As one fish harvester said, there is a difference between "being smart and common sense."

Harvesters reported numerous strategies to fish safely, including traveling to and from the grounds with other vessels, routine maintenance and related record–keeping. Harvesters also reported modifying their deck space to prevent chronic injuries by adding anti-fatigue mats or tables on which to pick cod out of their nets or sort crab thereby reducing bending and the risk of back injury. Modifications such as covering the deck floor with carpet or adding sand to the deck surface also work to prevent potential immediate injuries from slips and falls caused by slippery decks. Other strategies were built into the daily routine of work, for example, securing the boom hauler while steaming in or out. Harvesters also developed ways of managing the movement of their bodies on a moving

vessel by bracing a leg against the deck. Decisions about what to wear sometimes reflected safety concerns. For example, some crew kneel to pick crab and wear kneepads to prevent injury. Harvesters referred to these strategies as using common sense, which generally refers to knowledge about safe fishing practices acquired through experience and on-board mentorship by other harvesters. Common sense is accumulated over time, and for those entering a new fishery, like crab, the accumulation of common sense takes time and often occurs by trial and error.

The high cost and limited availability of safety training were among the issues discussed in the focus groups and the phone surveys. The cost barrier was linked to harvester struggles with a cost-income squeeze linked to declining quotas, relatively low prices and increasing fishing costs not only for safety equipment and training, but also for insurance, fuel, bait, licenses, dockside monitoring and observer coverage, vessel purchase, maintenance and repair, and, in some cases, the cost of quota. Strategies for dealing with this cost-income squeeze include letting their vessel insurance lapse; cutting crew sizes – sometimes fishing alone for lobster; greater reliance on family members as crew members, and buddying-up (fishing more than one license from a single boat). Some have also increased the size of the boat share relative to the shares to crew driving down crew incomes and potentially contributing to crew turnover (CCPFH 2005).

All of these changes have potential implications for fishing safety, some positive (buddying-up) and some negative (crew turnover). There was also some indication in the focus groups that so-called trust agreements with processors (agreements where processors gain control over licenses, vessels and/or landings in exchange for credit towards vessel purchase and construction) tend to increase the influence of processors and others who are not on the vessel over decision-making in the fishery including decisions on when to fish thereby increasing risk. Processors sometimes pressure skippers to abandon common sense and begin fishing in bad weather or at night. Important implications for injury prevention arise from conflicting pressures between making a living and putting safety first. On the one hand, fish harvesters certainly recognize the need for safety equipment and training and the need to minimize the risk of injury by monitoring when, where and how they fish, as well as who they fish with. On the other hand, they were quick to point out the financial pressures sometimes associated with purchasing the equipment and responding to the requirements for training in light of the cost-income squeeze in the industry.

Surveyed harvesters were asked to indicate which safety and navigation technologies they carried on their vessels. They were also asked to indicate which items they knew how to use. All items we asked about are carried onboard by over half of the harvesters we surveyed, with the exception of Digital Charts and Satellite Phones. These two particular items are recent evolutions of older technologies, which may suggest why they are not as common. Many fish harvesters carry paper charts (76%) in place of or in addition to Digital Charts, and cell phones (91%) or VHF (93%) rather than Satellite Phones. These newer items are most likely to be found on larger vessels that venture further offshore. Carriage of PFDs, life rafts and flotation or survival suits is still limited

among those surveyed. In general, most harvesters indicated that they knew how to use these technologies (See Figure 4.).

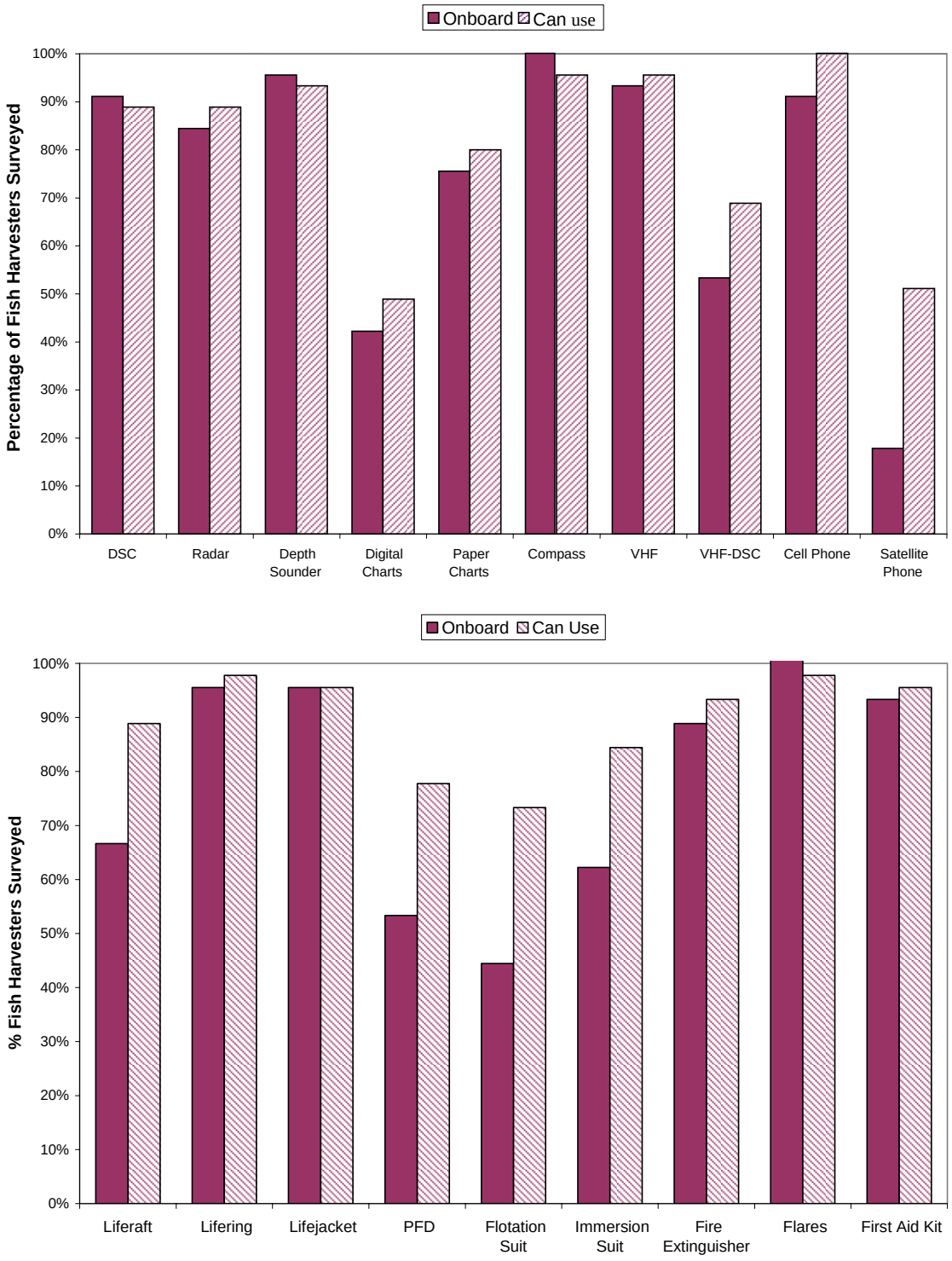

Figure 4. Carriage and knowledge of navigation, communication and safety technologies on fishing vessels in Newfoundland and Labrador.

More in depth research is needed concerning harvesters' knowledge about these navigational and safety technologies and their capacity to use them in challenging environments like an emergency. We noted a tendency for some harvesters to equate safety with owning safety and navigational technologies, an attitude that could contribute to a tendency to take greater risks and to over-reliance on the technologies based on the assumption that, should something go wrong, they will be able to save themselves and the boat. In addition, while navigation, communication and safety technologies can mitigate risk in some contexts they might also contribute to it. Thus navigational technologies, such as GPS, are very helpful when traveling to offshore grounds for gear retrieval, staying on course and reducing the risk of collision. However, over-reliance on these technologies and potential knowledge gaps related to their safe operation can undermine safety. Electronic equipment like GPS technology and laptop computers with digital charts often ceases to operate when power supplies fail and, therefore, can be useless when engines fail. Thus, harvesters should carry paper charts but not all do. In addition, GPS technologies can help plot a course and make it easy to return to particular grounds and gear but may not distinguish between water and land. Thus reliance on GPS technology has been associated with fishing vessel groundings. Finally, some types of safety equipment, such as life rafts and survival suits, take up a significant amount of space on board vessels. Space limitations on vessels under 65 feet in length sometimes force harvesters to limit the equipment they carry and compromise their capacity to store the equipment safely in places where they can access it easily in the event of an emergency.

Some focus group participants saw a tradeoff between fishing efficiency and fishing safety. "Well they could make improvements but then she wouldn't be as good a fishing boat. Like you could have higher rails on the side of your boat but then you'd have job with gear, like that kind of stuff."

Job Satisfaction and Risk

Despite the significant risks associated with fishing identified by participating harvesters, most report a high level of satisfaction with their jobs (See Figure 5.).

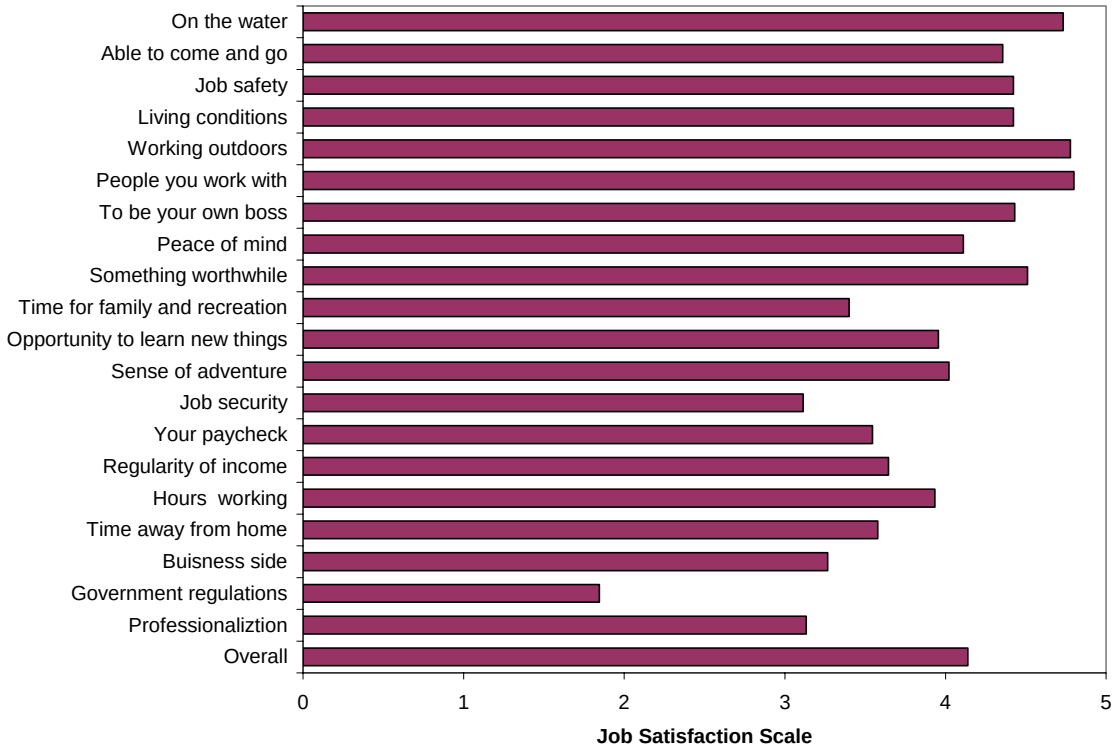

Figure 5. Mean rating of job satisfaction for various aspects of work in the Newfoundland and Labrador fisheries (satisfaction scale: 0 = very dissatisfied 5 = very satisfied)

On the survey question asking them to rate their satisfaction with different aspects of fishing, the items that scored highest on the satisfaction scale were: “being out on the water,” “working outdoors” and “the people you work with.” The items that scored lowest were: “government regulations,” “job security,” and “time for family and recreation.” Interestingly, the items that scored highest in satisfaction are those that are associated with traditional notions of fishing: being outdoors, on the water, working with familiar people. Government regulations and the notion of job security are rather new developments in the fishery. Fifty-four percent of harvesters said they would definitely go into fishing all over again, but 33 percent said they would only if the industry was like it was when they started fishing. Harvesters’ comments suggest they feel that they are now told when and how they should work, and that they have suffered a loss of autonomy and control in their work as a result.

Conclusion

Significantly, fishing safety regulations and training are primarily concerned with ensuring the safety of the vessel and thus minimizing the risk of sinking, collisions, fire and foundering. From a regulatory and training perspective, less attention has been paid to the role of changes in fisheries management in risk and to the fishing vessel as a work environment including workplace design and training related to ergonomics and safety practices during routine work. The management of rope is an example of a set of vessel design issues and safety practices that can play a critical role in reducing risk of injury

and death but that has not received substantial attention from safety experts or research. Working on poorly designed or in poorly managed work environments can reduce the potential for common sense to mitigate risk. Attitudes towards safety training appear to be mediated by age and by experience with such training. While older harvesters and young harvesters are less likely to see safety training as very important, younger and older harvesters generally see if as very important for younger people who lack experience. We asked our phone survey participants "Do you or would you encourage your children to fish for a living?" Of the 46 surveyed, only 6 responded yes to this question. Thirty-eight said no and 2 said maybe or somewhat. These results are consistent with the findings from a recent CCPFH (2005) which suggest that traditional recruitment and apprenticeship patterns associated with the <65 foot sectors are breaking down with potentially serious implications for safety in the future.

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