

- Pálsson, Gísli and E. Paul Durrenberger  
1983 Icelandic Foremen and Skippers: The Structure and Evolution of a Folk Model. *American Ethnologist* 10(3):511-28.
- Stiles, R.G.  
1972 Fishermen, Wives, and Radios: Aspects of Communication in a Newfoundland Fishing Community. In: R. Andersen and C. Wadel (Eds.), *North Atlantic Fishermen. Anthropological Essays on Modern Fishing*. Toronto: University of Toronto Press. Pp. 35-60.
- Van den Hoonaard, W.C.  
1977 Social Context and the Evaluation of an Occupational Culture: A Study of the Shrimpers of Isafjörður, Iceland. Doctoral Dissertation. Department of Sociology. University of Manchester.
- Þórlindsson, Þórólfur  
n.d. *Að vera eða látast: Er aflaskipstjórinn aðeins goðsaga? Afmælisrit helgað Brodda Jóhannessyni sjötugum*. Reykjavík. (In press).
- Ögmundsson, Karvel  
1981-2 *Sjómannsævi*, I and II. Reykjavík: Örn og Örlygur.

## Fisheries Risk in the Modern Context<sup>1</sup>

*M. Estellie Smith*

State University of New York – Oswego

### Introduction

The sea has long been viewed as a threatening environment and the folktales of many peoples list an impressive inventory of the real as well as imaginary dangers that are said to lie just beyond the horizon, out in the deep. Though, for much of history, fishermen were forced (and preferred) to exploit in-shore waters, such fishing still faces risks of sudden storms, capsizing in swells, or being smashed on rocks due to an error in sailing judgment. However, if there were dangers lurking in these waters, how much more fearful were the risks once out of sight of land? Not only the fishery folk but those who studied them could not help but emphasize the natural risks of fishery ventures – and, as well, the exotic defenses such as superstitions, taboos, amulets, prayers and the like, all designed to mitigate such risks.

As fishermen grew more venturesome and their vessels more sophisticated, they ventured further out to sea and the risks increased; in one of the world's great fishing ports, Gloucester, Massachusetts, 1788 men were lost in the period 1861-1881 alone – a figure that continues to be added to annually as the port's boats continue to ply the waters of the North Atlantic (Connolly 1940:322). More recently, Poggie (1980:128) reports that, in the area between Rhode Island and Maine, between September 1971 and October 1978, more than 70 fishing boats sank and an even greater number of men lost their lives off the New England coast. Even the large factory ships that began commercial fishing after World War II, sailing in vast armadas of catch/processing vessels together with supply and repair ships, have presented their crews with their own types of risks.

Poggie (1980:123) emphasizes the high occupational risks in commercial fishing when he reports that:

Official statistics affirm the extreme risk involved in fishing. Indeed, fishing is far more dangerous in terms of loss of life than coal mining – the most dangerous landbased occupation in American society. The Office of Merchant Marine Safety in 1972 reported that in 1965 the commercial fisheries of the United States recorded 21.4 deaths per million man-days in contrast to 8.3 in coal mining (U.S. Bureau of the Census, 1970 as cited by Poggie 1980:123).<sup>2</sup>

Despite these figures, only too well known to fishermen, informants shrugged away Poggie's suggestion that their work was very dangerous. Rather they tended to trivialize occupational risks as, 'no more dangerous than riding in a car'

– a response Poggie attributes to “repressing their awareness of the dangers of their occupation” (1980:123).

I would like to argue, contra Poggie, that the ‘trivialization of natural risk’ that he noted should not be reduced to a psychological explanation (i.e., a repression of fear) but, rather, can be attributed to sociocultural factors, a change in the expanded environment of risk within which the modern fishery people operate. For most commercial fishermen today, it is not storm, demons of the deep, and/or cosmological views grounded in a primitive folk science that pose the most critical ‘clear and present dangers’. Rather, it is the dynamics generated from the economic, political and technological contexts within which commercial fishing operates today. This has resulted in a new prioritizing of the hierarchy of risks.

Somewhat paradoxically, my position is supported by the most recent research of Poggie and Pollnac (this issue, p.75). Challenged by Mullen (1968) and Lummis (1983) that “economic uncertainty [rather than personal risk] is the primary influence on level of superstitious behavior” (Ibid.:68), Poggie and Pollnac report that their findings, “tend to weaken the economic determinant hypothesis. Since skippers and owners have much more to lose as a result of low catches, one would expect them to have more taboos. They do not . . .” (Ibid.:75). Given the greater risk fund of skippers and vessel owners (not to mention their more extensive opportunities for manipulative profitability) the claim that skippers and owners have much more to lose may be true, at best, only in relative terms. But, assuming for the moment the legitimacy of this argument, let me attempt to show how such findings are consonant with the position taken in this paper.

I do not question that the physical risks of the occupation are still an important concern of those whose livelihood centers around the sea and, to the extent that fishing remains a high risk occupation, to that extent fishermen and shore-side family members cannot rely on purely secular safeguards or after the fact remedies. What fisheries people themselves label ‘superstitions’ are, therefore, still utilized. There are few if any individuals who do not possess some general and/or idiosyncratic safeguards (cf. Poggie and Pollnac, this issue).

However, Poggie (1980), referring to a study that he and Gersuny did in 1972, argued that taboos among New England fishermen are responses to “the perceived risk associated with protection of life and limb, and not with production of fish, a distinction not made by many theorists” (1980:124, my emphasis).

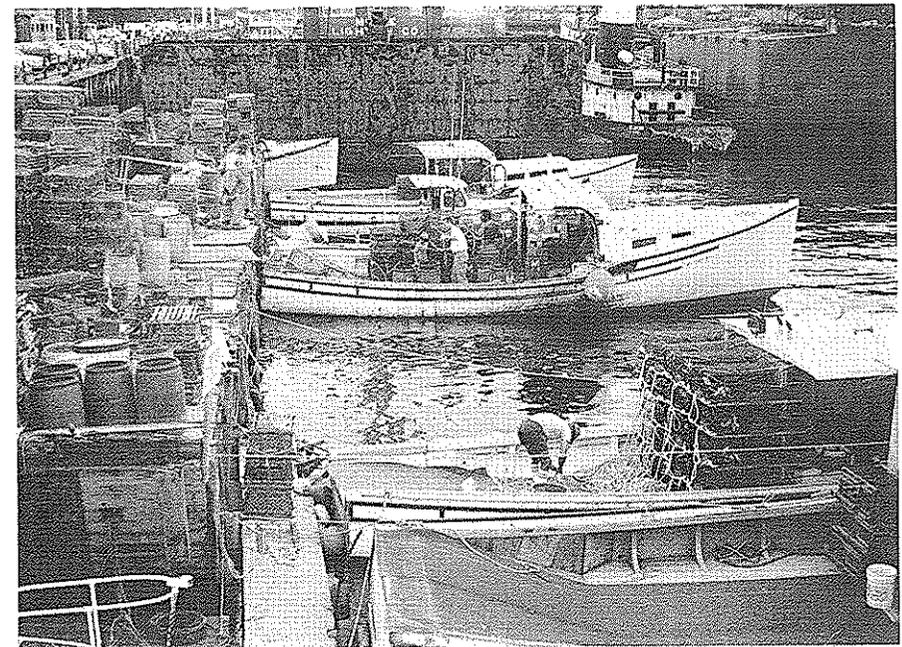
There is no evidence of which I know that indicates a greater degree of personal risk at sea today than, say, 50 or 100 years ago. Economic and political risks *have* increased significantly, however, and secular dangers require secular reasoning – i.e., causally-based strategizing in a rational and scientific mode. It would give one pause indeed if one discovered that skippers and owners (and why not include shore-based industry-members too?) were attempting to cope with the risks of the market or bureaucratically-imposed fishing constraints by reframing old or inventing new taboos and rituals – e.g., ‘Don’t whistle when you pass a Coast Guard vessel.’

If, as I am arguing, such individuals re-prioritize risks and fears – giving

primacy to the secular dangers of the market and management constraints – one would not expect them to enlarge and expand upon those ‘rituals of avoidance,’ ‘taboos,’ and “non-rational and/or non-scientifically based belief[s] concerning cause-effect relationships” (Poggie and Pollnac’s definition of ‘superstition,’ this issue, p.76).

Poggie is correct; the distinction between domains of risk is critical – and not only for the analyst. For the majority in today’s commercial fisheries the economic and political factors intruding into the getting of a livelihood in fishing are the conditions of paramount concern. This is why this paper chooses to address that secular domain.

Given this clear cognitive distinction between the natural (cum supernatural) and the cultural (cum secular) risk arenas, it is in the latter area that fishermen perceive the most omnipresent risks to reside. Yet, in addressing such risks, the people of the fisheries at once feel themselves most helpless – yet most compelled to struggle to plan practical strategies. While the fisherman cannot do much about inclement weather, while he prides himself and evaluates others on the basis of skills and knowledge of the sea developed over the years, and where he relies on a common sense usage of care around machinery, he is aware that much of the business of catching and selling fish is controlled by humans and his success depends on the extent to which he and his have control over and input



Massachusetts Lobstermen

into the workings of that system. On the other hand, he also knows that his world is the world of the sea and his vessel; even his home and the town in which he lives is not as familiar and manageable as the vessel on which he fishes and the maritime setting in which it is sited. In trying to deal with the economic as well as political forces that are, increasingly, having an impact on his earning a livelihood, the fisherman often expresses the belief that, in such matters, he is 'like a fish out of water.' The machinery of the market, and of government (especially, of late, the very special governing sphere of fisheries management) constitute, for the majority, a baffling, hostile, even irrational context.

Still, just as fishing folk designed what, for them, were rational and causal strategies (for all that we would label them taboos and superstitions) for their well being at sea, so the members of the community are attempting to devise techniques to cope with these new socioeconomic risks. Such risks are increasingly seen as the top priorities to be addressed by those whose livelihood depends on the primary exploitation of marine resources.

The physical risks are the dramatic risks — the ones about which we all hear and from which the great novels and oft-repeated songs are spun. But for the modern fishermen and their families the other, less dramatic risks are of more immediate and pressing concern. Though fishery people are reluctant to articulate the consequences of such risks they are aware that these dangers represent a threat to the essential features of what we think of as the traditional mode of production itself, some of the components of which are what attract people to the occupation (and its attendant life style) in the first place. I speak here of such traits as the (1) low entry costs — which make it possible for relatively impoverished and/or undereducated individuals to enter the fishery initially; (2) the strongly held belief that, for someone with luck and/or ambition and daring, there is unlimited entrepreneurial opportunity; (3) certain 'quality of life' components, such as the comradere among the crews and the independence from decision-making by others, that offset the hardships; and, (4) for most still (though, again, they are loathe to speak of it in this way), something called 'the romance of the sea.' But many of these features — to the extent that they ever really existed — cannot be sustained in the face of the growing command being assumed by the market forces of the world economy; by local, regional, national and international political forces; and by the varied forces encapsulated in the term 'fisheries management.' It is to such current risks that this paper addresses itself for it seems time to stop looking at fisheries people as quaint and picturesque village folk whose lives may be summed up in a recitation of primitive albeit colorful beliefs and superstitions. Once we can delineate the primary concerns of the populations whose lives center around and are shaped by the dynamics of 20th century commercial fishing, it should be easier to make sense of the external stress and internal strain that mark relations among such sectors and, say, the ecopolitical sphere of national and international macro-systems (i.e., the sphere where public and private compete *and* consort in order to attain economic and political ends).

### A View of Risk from the Perspective of the Fisher People.

A recent conversation with a New England fisherman and his wife encapsulates the issue being addressed here.

*Fisherman:* You can really worry or fret about things like bad weather, getting caught in a steel cable or things like that — personal risks. But it don't do no good to worry about what you can't do anything about. Nobody plans for that and if it does happen it's either bad luck or something stupid you deserve to get wapped for. You take care of what you can. Hell! Nobody *plans* to get sunk in a storm. Me, I worry more about the amount of fish I'll catch, what the prices will be when I dock, getting cheated, paying the boat insurance and my crew and my mortgage, meeting trip expenses, and whether I should repair what I got or go into hock to buy new. And if I do buy new, what kind? Should I get what everyone else has so I can learn how to use it from them or get help from them when something goes wrong — or should I get something better to get an edge on the others? I do the second, I'm liable to outsmart myself and get something too complicated for me or anybody around to understand.

Most of all, these days, I worry about things like 'Am I going to get slapped with a violation?' Or 'When are they going to change the fishing regulations again?' Things like that.

*Fisherman's wife:* That's right, that's right. Sure, you think about things and get worried in bad weather — but most of the time we don't think about those things — or, at least, we don't think we think about them.

But every day, no matter what about the weather — and even when Joe's home (or, maybe, especially), we sit and worry about whether we're going to make it this week, or this month, or this year. Just about the time you think things are under control, something new happens. And you worry so much about not being able to go fishing that sometimes I wake up at night and know I've been working on the boat accounts in my sleep. Not make it through no fault of trying — that's the worry you live with all the time.

*Fisherman:* Yeah. And I'll tell you, a lot of the other risks you were talking about [e.g., accidents at sea], those happen *because* of the economic risks that seem to be getting to be a bigger and bigger part of every day. We might not go out in bad weather if we didn't know that tomorrow the 'fishcrats' [i.e., federal fisheries managers] might close the stocks and not let us go fishing for 2 or 3 weeks — maybe more. So, you fish by the threat of the regs [i.e., regulations], — not by your common sense of the sea the way your daddy did.

Pretty soon there won't be no choice left at all. You'll fish on alternate Tuesdays or whenever they tell you can. You wonder we sometimes take a drink too much? You wonder why some guys go out with the shakes from too much the night before? That's why. Sometimes the worry and the disappointments really get to you.

*Fisherman's wife:* Look at Pete and Josie. He took out that loan to buy a new Loran — and the government made those new rules about the mesh size of the nets a few days later. So that was more money, just when he could least afford it. Then, the government went and closed fishing for yellowtails [a type of flounder] and that made Pete really hard up for money. Josie got an ulcer and started nagging at him all the time for buying a new unit instead of making do with the old one.

*Fisherman:* All Pete wanted to do was be better able to find fish. That's all.

*Fisherman's wife:* Well, he should have known better in times like these. Now, he's on the verge of losing his boat *and* his house. That house has been in his family for 4, maybe 5 generations; it'll be a real sad thing if they lose it to the bank.

*Fisherman:* I tell you, you worry if you don't take the gamble — 'cause then you'll never

do much more than scrape along – if even that. But, if you do jump in, it's liable to all go sour and leave you in a real mess. You're damned if you do, and damned if you don't. But there's always some new decision, so the tension never lets up. What with one thing and another, you never can rest easy. But the worst of it is, still, that even if you do everything smart, there's going to be some bastard out there waitin' to cheat you, or pay next to nothing for your catch, or gettin' ready to start screwing around with the system because he's worried about 'saving the fish' or helping 'the poor sports fishermen' in their fancy boats. Us fishermen are just the 'bad guys' who are 'raping the stocks to fill their pockets and get rich.' Don't I wish! But it's hard to know this, or stay on top of things until, after the fact – when it's too late to do much about it. Now, *that's* the real risk that all us fishermen face all the time these days.

This lengthy excerpt (from field work last year in a Massachusetts fishing port) is typical of many such conversations. It vividly portrays the various types of risk that confront the fisherman today. Again, I do not wish to minimize the traditional risk factor of the fishery subsistence mode but this paper will try to bring into balance the dimensions and various components that make up the total world of risk faced by fishermen and their families.

The next section will explore these risks – and the strategies that are employed to cope with them – though, as will be seen, some of the most popular tactics actually increase the very risks the fisher people are trying to minimize and/or avoid.

### Modern Risks and Protective Strategies

#### *Social Risks*

Not the least risk the fishermen face is, of course, the social distancing between themselves and their families. Not uncommonly, wives and children live what might almost be labelled 'separate lives' from the fishermen. Though the wives of fishermen are playing an increasingly active role in shore side matters (e.g., handling the bookkeeping, government paper work requirements, and participating in women's associations that help publicize the importance of fisheries to the larger community), it is still more the exception than the rule for women to play an active role in vessel affairs. Some fishermen are growing increasingly dependent on women to provide them with necessary information about shore side actions by fish buyers, the government, the town governing boards. They are especially dependent on women to monitor the activities of the fishery management councils and, as well, the National Marine Fisheries Service (NMFS), the federal agency that oversees the workings of the 8 quasi-federal regional fisheries management councils mandated to manage fishing in their respective zones.

On the whole, however, there are still many households in which the distance between fisherman and other family members is large. A skipper told me recently that he was shocked to find out that his 16-year old daughter had been dating one particular boy regularly.

I started complaining she was too young for one steady boy. But my wife tells me, 'Well, you aren't here and when you are you don't pay any attention to what I say – and it's too late now to do it different.' And I figured it was, so I just shut up. But you know, I'm out 8-12 days at a time and when I get home I want to just sleep or else have a little fun. What can you do?

#### *Territorial Risks*

It is not only risk in the market, however, that threatens the fishermen. They are facing the loss of their space: at sea, there are problems on the fishing grounds, as more fishermen crowd in and compete for the same stocks. Not all fishermen face declining landings due to such crowding; it is usually the smaller, older 'less efficient' vessels that suffer the soonest – though it would seem obvious that, sooner or later, even the best must face declining hauls. Space is also a factor as the search for variable resources increases conflict among different gear users (e.g., the fixed gear of the lobstermen vs. the nets of the draggermen). Competition is heightened by the fact that continental shelf areas are multiple-use zones and the fishermen must compete with commercial shipping, recreational boaters, off-shore waste dumpers, sand-dredging (for construction) and the like. Off-shore waste disposal and oil drilling (which most assume is only temporarily in abeyance) present pollution and stock displacement hazards, and in the traffic lanes the potential grows for collisions between fishing boats, recreational craft, and shipping vessels.

Wharf space grows ever more scarce and fish buyers as well as fishermen find it hard to compete with the recreational vessel marinas or the retirement and leisure time condominiums.

Even living space on land – for housing, for supermarkets, clothing stores, and other establishments that cater to the low or moderate income groups who have traditionally lived in fishing ports (including those who have serviced the port populations such as clerks, barbers, waitresses, appliance or shoe repairers) – is becoming too crowded, too costly, for low-income families to be able to maintain their niche. In the competition among various user groups, the interests of commercial fishermen, indeed, the industry at large, plays an increasingly secondary role in the eyes of the larger population, whether they are regional planners, political decision makers, or private entrepreneurs. Tourists, urban commuters, retirees, all are forcing the fishing families out of towns where they have long time roots. As property appreciates, so do taxes and other costs of living. Today, it is not uncommon for fishermen to have to drive miles to their boats and/or land their fish at a port other than out of which they fish. All of this increases so-called indirect fishing costs.

It is ironic that the very feature that attracted other interests to these locales – the 'quaint, picturesque fishing port ambiance' – is now a source of irritation to the new arrivals. Once deemed 'charming,' the lobster pots piled high on a neighbor's lawn are now classified as 'smelly' and 'an eyesore' to be eliminated – by law if necessary; fishing boats, in need of paint, rusty, reeking of

diesel fuel and noisily disturbing a good night's sleep as vessels leave port at 3 or 4 A.M., are a nuisance; and even the fisher people themselves 'are not really the sort you want as neighbors.' That the massive influx of population and the development that lures as well as responds to such newcomers is itself a major cause of environmental degradation (groundwater contamination due to inadequate sewage facilities, shoreline wastes, the destruction of ecologically valuable salt marshes, etc.), is little considered by these arrivistes. In short, many fisher people see themselves rather than the fish as 'an endangered species.'

### *Political Economic Risks*

As mentioned above, traditional strategies do not protect the fishermen from the growing number of socioeconomic risks grounded in the managerial sector of the political economy. Thus, it would be to their advantage, clearly, to participate more fully in shore side affairs. But the extent to which fishery people do *not* play an active role is almost a truism in fisheries research. My research indicates, however, that there are many barriers to such participation, some of them long-standing, still more of recent derivation. For example, when the fishermen take the time to public meetings — time that must be scheduled according to the shore sector's schedule, not the fishermen's — this is unpaid, non-profitable time away from his job. The most economically marginal and thus the most vulnerable are the most threatened but the least likely to attend meetings since they are the least able to afford such losses. Those in this same category also tend to be the least educated and therefore reluctant to speak in public, to those several label 'the educated big shots.'

One skipper I know was extremely concerned about what he saw as the need to attend the monthly meetings of the New England Regional Fisheries Management Council (one of 8 governing bodies established in 1976 to manage the resources of the U.S. continental shelf and designed, rather paradoxically, simultaneously 'to conserve the stocks and improve the fishing industry'). However, each time that he attended the two- to three-day meetings, or one of the many public hearings designed to elicit public input on projected management rules and regulations, his crew grumbled at the lost fishing days, his wife nagged about decreased household monies, and the buyer to whom he regularly sold, complained about short landings. Contrariwise, however, when he and others like him are absent from meetings or hearings, not a few of the fisheries managers are quick to argue that this indicates not only the disinterest of fishermen in participating in the framing of rules and regulations that govern their livelihood but also indicates the need to have such a governing body in the first place since it indicates fishermen are more concerned with making money than helping to manage the stocks for long term benefits to all. As one council member put it to me: 'The fishermen are too greedy to take a day off from fishing to show up at these meetings. They cry when it's too late — when regulations to save the stocks go into effect or after the fish are all gone.' A fisherman standing nearby overheard and responded angrily,

You get paid for coming here; I lose pay for coming. You get money whether you're right or wrong in your 'guesstimates' about the stocks. You can afford to be high and mighty and say, 'It's better to be safe than sorry — so let's tighten the landing quota.' If you're wrong with your constant under-estimates, you're safe — and I'm sorry. So you don't give a damn if your figures are off. You can sit here and dilly around; I got to get out there and *earn* my day's pay — if you let me.

It's not just here that the enforced absence from shore activities and the different temporal framework of work activities puts the fisherman at risk. They have found it equally difficult to attend tax rate hearings, town meetings on dock fees, and other events in their locales that determine the cost of living or vessel operating expenses. In one town where I've worked, the members of the fleet have tried for years to get better wharf facilities. But even when this is an agenda item and they miss a trip to attend hearings, agendas get reordered and discussions on other items may lead to a postponement of the topic, sometimes for several sessions. After two or three such delays, the fishermen give up and stop attending — only to find that, at the next meeting, the issue was discussed and voted down with no opposition. This is not always accidental and some town boards are well known for the delaying tactics used by key individuals to prevent the fishing community from being heard.

But, with all this, it is still the more explicit category of risks represented by the market and the fisheries managers that looms largest in the everyday concerns of the fishermen and their families. Even in the most closely knit groups (e.g., the group of Italian immigrants who now dominate the Gloucester fishing fleet) there is constant concern among the members about the extent to which they can be treated unfairly by those with whom they economically interact. Bartlett (1977:100) tells how one such fisherman views those others to whom he is inextricably linked:

Thirty years ago the old fishermen led him on the rocks and he learned; don't trust other fishermen. But fishermen belong on the right hand of God compared with fish dealers. You don't choose a dealer by his honesty, but by his degree of dishonesty. The fishermen assume all dealers are thieves; it's just which will rob them the least — or is most willing to share in the thievery.

The American fisherman is caught up in a complex marketing chain that increases the risk of depressed prices because, somewhere in the process, it will be decided there is an over-abundance of fish on hand.

The fish will be briefly held by as many as eight people before it is eaten. [The skipper and crew] have possession first. They sell it to the buyer at the fish dock. He may sell it to the trucker who takes it to New Bedford, and there it is sold to the cutting house. It then goes to another trucker who takes the fish to New York, then to a dealer and perhaps still another trucker, then it goes to the restaurant — or market-owner. Finally, the customer takes possession of the fish, carries it home, and eats it. Of course, each time the fish changes hands, its price goes up (Matteson 1979:81).

Some of the current market risks faced by the fishermen are also touched upon in a development report prepared by a consultancy firm for the city of Gloucester (McPherson 1973). In analyzing the role of the fishing industry in this major world port it was noted that competition from foreign frozen fish – cheaper and more convenient to market around the country, more adaptable to the life styles of modern American families given the ease of table preparation – has cut heavily into the market for Gloucester's fresh fish landings.

In a paper discussing traditional market relations in a California fishing community, Stuster (1980) stresses that the fisherman is at risk primarily because

[Fish] is produced in unpredictable quantities and must be marketed quickly to preserve quality. Because of the unpredictable supply, fishermen are usually forced to continue to fish even when prices drop . . . Furthermore, because fresh fish must be sold immediately (within a day or so of landing) production cannot generally be stored until market conditions improve . . . The urgency to sell one's catch is further compounded by the desire to return to the grounds; unnecessary time spent in port is viewed as money lost (1980:5).

These remarks of Stuster emphasize that the traditional economic risks of fishermen continue to exist – and, for the independent petty commodity producer, even intensify – in today's world. Few fishery people are naive enough to see this category of risks as one that can be guarded against by prayer, amulets, or the respecting of taboos. The limits are cognitively drawn between the dangers of the sea per se and those that emanate from the shore – the latter representing the political economy of the socioculture and the world system in which he and the fishing community to which he belongs are inextricably embedded.

### The Political Economy of Fisheries Management

A major change came to the fisheries with the passage of what is now called the Magnuson Act, a bill that the fishing industry worked hard to have passed and applauded when it was implemented in March, 1977. They saw its intent as being the ousting of foreign fishing vessels from traditional American waters. But, as McCay shows in her capsule summation (1980:20), there was a lot more to it.

In 1976, the United States Congress enacted a law which extended national jurisdiction over fisheries out to two hundred nautical miles . . . This "200-mile limit" law, the Fishery Conservation and Management Act of 1976, sharply restricted foreign fishing in the coastal waters of the United States and its territories. It also mandated the development of appropriate plans for the management of fisheries through the aegis of regional management councils and codified that objective of fishermen as "optimum yield" [a concept of stock conservation based on projected biologically-determined landing maximums as modified by what are deemed to be such 'relevant' sociocultural factors as economic and political realities].

The fishermen discovered, as one skipper put it, that the new law meant that, 'the government now owns the fish that used to be free. I guess that means they're going to own us too, pretty soon.'

In New England, currently, the activities of the Fisheries Council and NMFS (plus the Department of Commerce within which NMFS is located) are perceived as the overwhelming source of risk relative to the survival of the industry and, especially, the entrepreneurial dimension of that industry.

The protective strategies employed to counter or at least moderate such dangers are as secular as the risks themselves. Generally such strategies fall into three major categories: (1) shore side social linkages at the formal and informal levels; (2) sea-, dock- and shore side ecopolitical activities – public and secret, formal and informal, legal, quasi-legal and/or ethically questionable circumventions, and outright illegal; (3) technological.

(1) The social linkages are varied and are grounded in kin ties (consanguinal, affinal and fictive) as well as locational and occupational commonalities. There are bonds generated by having a common religion (and belonging to the same congregation), coming from the same village or region in Europe, ethnicity (which may give the added dimension of a common second language), and fleet/port/regional commonality. The latter may be called into play when fishermen from outside of the New England region 'invade' local waters. There are also connections based on membership in associations derived from fishing the same resource or in the same zone (e.g., the Massachusetts Inshore Draggermen's Association). The ties formed can be the basis for aid in a financial crisis; provide valuable information; or lend assistance in some emergency.<sup>3</sup>

Increasingly important are ties among fishery women, particularly those who have formed political action groups or sodalities to enhance the public image of the fishing industry by, say, sponsoring seafood festivals or working through the mass media to publicize the plight of the fishermen. Such women can also be valuable sources of information concerning matters about which the fishermen would otherwise remain ignorant (e.g., prices paid other fishermen, regulatory avoidance strategies, regulations being considered but yet to be implemented, shady practices by fish buyers, investment or relocation plans by other fishermen). Women, traditionally, have made an important contribution to the maintenance of the fishery mode but, in a world where demands for record keeping and documentation are on the rise, women are playing an increasingly explicit role. Further, in some of the smaller, economically marginal, 'family vessel' operations, the shore side employment of women provides valuable alternative income, whether through actual wages or because seasonal employment makes them eligible for unemployment benefits that helps in lean times.

(2) The largest category of strategies would appear to be those grounded in ecopolitical activities. They usually involve only a few individuals – a wife or professional accountant who 'cooks' the account books so as to avoid paying full taxes on earnings or, at least equally important these days, can keep vessel records so that no regulatory violations occur; a private arrangement between a buyer and fisherman that accomplishes the same ends as above and, as well, may give a skipper extra earnings above those shared with the crew – or allows a vessel to land catches of prohibited types or quantities of fish. There are circumventions of fishery management regulations – e.g., "... under the emer-

agency regulations boat owners realized they could catch three days' allowance of fish in one day of fishing if they left the dock at 11:59 P.M. one day, fished the next day, and returned to port at 12:01 A.M. the third day" (Dewar 1983:159).

There is, so far as I was able to find out, little bribery of officialdom — though there is the occasional private contact between some shoreside industry person and a political or administrative figure that may be the source of advance information or, alternatively, the use of the latter as 'a friend at court.' A far more common illegality is the smuggling of contraband (these days usually drugs) and my data lead me to estimate that as many as 15% of the fishermen have engaged in this at least once or twice. The majority of those involved operate on a small scale — most claiming they do it on an irregular basis and then only to be able to keep on fishing in the face of economic pressure brought about by the volatility and unpredictability of the resource and management process. I have been told that, 'an extra couple of thousand at the end of the month when you need it can make the difference between losing your boat or staying alive.'

### Technology and Risk

It is within the category of technology that we may see most clearly how inter-systemic are (a) risk, (b) strategies employed to avoid or at least ameliorate risk, and (c) the increase in or creation of new dangers by the very strategies employed in (b) to offset (a).

Douglas (1966, 1985 and Douglas and Wildavsky 1982) has contributed an especially provocative voice to the debate on risk. One of her most interesting hypotheses stems from the question of "why so many . . . judge everyday hazards to be safe and think themselves able to cope while they cannot." She answers this by setting every individual within a context of mutually interdependent fellows who may offer or withdraw support depending on the extent to which the action which generated the need for such support was deemed reasonable or socially unacceptable. Thus, "If a group of individuals ignore [sic] some manifest risks, it must be because their social network encourages them to do so. Their social interaction presumably does a large part of perceptual coding on risks" (Douglas 1985:66). Carrying this beyond the constraints of Douglas's focus, one could further hypothesize that, lacking adequate interaction (and thus a coding of risks), new dangers would be perceived as risk compounded since there would be neither criteria for appropriate response nor assurance of support. It is just this situation that has been created by the massive intervention of fishery managers and the bureaucratic 'software' technology that is being imposed on the industry in the name of conservation of the stocks.

Such a statement is not meant to minimize the material (rather than organizational) technological changes that have occurred in the fishing industry over the past century (and particularly since World War II). These have affected a qualitative change in both content and context. The latter is of special significance since it has led to dramatic changes not only in the environment per se (e.g., the condition of the stocks as affected by increased predation and other factors such as

pollution), but, as well, in the way we identify the 'environment.' Even the most insular of fishery people are cognizant that their world no longer consists of their immediate niche and the people as well as resources in it. They talk of the 'political climate in Washington' or the strengths/weaknesses of their social networks with significant decision-makers in the same way that older fishermen once limited their concerns to each day's weather or the state of their fishing nets.

Obviously, people of the fisheries are concerned with the ways in which technology can be utilized to help them cope with environmental risks which fall into two major categories, natural and sociocultural.

Technological hardware addresses the concerns in the first sphere. Well-functioning and soundly designed equipment minimizes random accidents as well as (at least in theory) decreases sea-related physical and economic risk. Directly concerned with safety at sea, there is the electronic gear that warns of bad weather and/or helps to get assistance in a crisis; the survival suit, inflatable lifeboat with rescue flares, etc., that, along with air-sea rescue programs decrease at-sea risk.

There is also the hardware such as fish-finding gear that enhances search potential; icing machines and better storage facilities on the vessel that improve chances of getting higher landing prices for better quality fish. Since the primary economic goal of the fisherman is to land a good catch at a good market price, a 'highliner' (the most consistently successful fishing captain(s) in a fleet) usually has the best gear and crew. Such a skipper can take the vessel out in weather that might keep less seaworthy or less well equipped boats in port; he and his crew can earn an income when others do not. Indeed, they increase their earnings in such situations since, because others are not landing fish, this often means higher than usual prices for the fish that is landed. Top of the line fish-finding gear makes it more likely that the vessel will find fish when less 'state of the art' vessels return at best only marginally successful. Further, the captains of such vessels usually have the pick of the crewmen, another factor that enhances both quantity and quality of fish landed. This, of course, feeds back into the physical sector since such crewmen are both more productive and less likely to be a hazard to their mates because of their lack of skill or inefficient performance. Thus, there are fishermen who dispute that, given their cultural perception of and reactions to either type of risk, the technological hardware represents one fundamental variable in differentiating high/low risk contexts.

But the latest technology is expensive. Each vessel owner must weigh investment risks and do a short- and long-term cost/benefit analysis. This is extraordinarily difficult; quantifications are fuzzy and volatile factors, given the constantly changing worlds of both the market and fisheries management — not to mention the maritime context itself. Indeed, it is not always clear as to what are costs and what are benefits. There are new skills to learn and this can require being able to bear a preliminary financial loss due to (a) a resistance to learning unfamiliar techniques, (b) lack of background skills necessary for learning these new techniques, (c) the reduction in income due to the inevitable downturn in

fishing efficiency during the initiatory phase.

Secondly, old skills can be lost surprisingly soon – and younger crew members may never have learned them. If the equipment malfunctions (or, as in the case of certain types of safety gear, is never tested to learn its operations, or periodically checked for operational efficiency) and traditional, non-mechanical or other alternatives are not available to substitute in an emergency, the potential of risk increases *because* of the new technology.

Thirdly, in an ironic twist, the latest equipment can lead to too much faith in the capacity of the hardware 'to take it,' to always respond as needed, as well as too casual an attitude towards fishing risks. For example, the greater the amount of safety gear, the more one relies on technology rather than human attentiveness to the possibility of danger; one assumes 'nothing' can happen – and grows careless. I call this decrease in caution relative to potential risk (a cognitive orientation that can be related to a rise in accidents), 'the Titanic syndrome.'

All these dangers aside, the very success of such vessels has added to the risks faced by industry members and generated by the other risk sphere, that generated within the sociocultural sector and specifically related to fisheries management. Personnel from the latter category are making increasingly vociferous demands for control of the technological capacity of the industry to reduce stocks below a viable reproductive level. Managers claim that, unless the industry is controlled, its increasing potential for predation will destroy the very productive base upon which it rests. The fish managers are calling for both limited entry (e.g., licensing the number of fishermen and/or vessels permitted to fish) and limited effort (constraining the amount of catch). The argument is that it does no good to limit the number of vessels or fishermen alone since constantly improving technology will simply allow an ever shrinking number to catch as much if not more fish – especially given diminished competition in fishing areas.

Industry members respond that there is little point in protecting the stock to such an extent that the industry is ultimately wiped out. Protesting a closure at a public meeting of the New England Management Council, one New Bedford scalloper shouted angrily, 'Sure, save the fish and destroy the fishermen! Then, with no American fleet left, the foreigners come in and fish for us – at twice or three times the price once U.S. consumers have no option but to buy from them.'

It is a poignant dilemma and one for which no country has yet found an adequate resolution. Setting catch limits often requires fishermen to return fish to the sea since they are prohibited from landing them despite having captured them in their nets. The fishermen argue that dead fish do not reproduce and such a ruling creates 'criminal waste.' They cannot determine, they say, what their nets will bring up. The managers respond that (a) the catching of one or another species is not nearly so random as the fishermen (who at other times brag about their ability to know where to go for certain species) would like to have the managers believe; (b) the fish are not always dead when returned and, (c) most in point, without such prohibitions the fishermen would lack any constraints

and continue to overfish until the stocks declined below a viable reproductive level.

In response to this last claim, the fishermen respond that market economies would lead them to stop fishing long before that lower level was reached. Trips, they say, would become too costly relative to rewards and they would switch to another species, go to new grounds, give up fishing voluntarily, or be forced into bankruptcy. Both economists and marine biologists argue against this scenario, claiming that, first, as fish become more scarce, the market price increases so that fewer fish bring as much or greater rewards; second, better technology can increase capture potential despite lower stocks and thus lower costs ultimately; finally, the marginal utility of the biological base and the market are not so interdigital – the lower limits of a stock's reproductive potential (particularly schooling fish such as herring) can be reached long before the stocks become so scarce that trip costs exceed profits.

### Macro-Ecopolitical Factors

In a quasi-fictional/documentary study of a New England fishing town, Moorhouse (1979) captures the sense of tension that exists between, on the one hand, the would-be fisheries managers from the political, economic, and scientific sectors, and, on the other hand, the fishery people. He describes a public meeting on the issue of a new ruling dividing a favorite fishing area into two contiguous zones with differing regulations for fishing. At the meeting is a state senator who decides that

the evening had probably been worthwhile after all. It needed to be in weather like this. Some of his colleagues . . . had thought him a fool to venture forth just to hear fishermen let off steam on an issue that had long ago been settled beyond their reach. Fishermen did not figure highly in the calculations of American politicians for there were not enough of them to make much difference to the vote . . . The Commonwealth of Massachusetts itself could not do a damn thing to change the statute, with all its corporate power. Not even Washington was the ultimate arbiter of these fishermen's fate. That had been slowly and tortuously settled over a couple of decades by international politicians and public servants perambulating round the world . . . These people were peanuts, and they knew it: only they didn't know that they'd already been roasted (Moorhouse 1979:163-64).

Though this was written about New England one does not have to strain to hear echos of the bitter disputes that have racked the EEC in recent years. In large measure this is because fisheries management, like most other productive systems today, is a complex tangle of political, economic, environmental and social considerations – that we attempt to unravel in the dark and fog generated by constantly changing alignments based on local, national, and international competition, as well as public and behind-the-scenes negotiation, on the basis (if we could but admit it) of inadequate data.

The ecopolitical ramifications of fisheries management are varied and complex and there is room here to mention only three. Siegel (1980:19, as cited by

Hennessey 1983:77) is concerned with the fishermen's growing sense of being at risk because of the number of decisions that are being removed from his control. He charges that the process of council management "acting through the federal government, has been making many of the basic decisions normally made by fishermen; catch rates, gear seasons, number of trips, and fishing areas."

The myriad of regulations, constantly being added to, reformulated, suspended, withdrawn, elaborated, and reinterpreted, create such essentially economic risks as having to fish whenever and wherever one can — according to the rules. "All these regulations did not occur simultaneously . . . they came about in a fundamentally serial, remedial, and incremental manner . . ." (Hennessey 1983:77). The danger of unwittingly violating the laws and regulations and then suffering penalties and fines that might range from a critically timed confiscation of catch or loss of a fishing permit, to the seizure of a vessel, increases risk annually at an exponential rate.

At first, under the management of the so-called '200 mile limit act,' the New England Council permitted an open access fishery for allocating cod, haddock and flounder to vessel class groups while imposing trip limits. This proved unworkable and so a quarterly quota system was initiated. Then, as the Director of Marine Resources for the State of Maine (and a mandatory member of the New England Council) has described the process

Weekly catch or trip limitations by vessel class were added, in an attempt to spin-out the quarterly allocations as long as possible. Along its path of evolution, the plan accumulated other quotas for certain [recreational] vessels, geographical quotas, and Canadian allocations (Appolonio 1978:29).

Hennessey comments in amazement (1983:78) that, in the New England region alone, "The combination of these quotas, allocations, and trip limitations amounted to more than 100 different quotas of different kinds!" In agreement with Appolonio he states that, "The cumulative impact of this 'architecture' of complex regulations was 'widespread violation of and noncompliance with the law and probably a significant reduction in the reliability of landing data'" (Appolonio 1978:30). Hennessey summarizes the situation by stating that

Each remedial move by the councils . . . required the subsequent issuance of additional regulations in a vain attempt to gain control over a deteriorating situation. The end result was an ineffective and painful management record which was fostering noncompliance to myriad regulations.

It strikes not a few that it is little wonder that the majority of the fishermen constantly complain that their livelihood is at greater risk from the 'fishcrats' than from any dangers posed by the sea, the weather, or the unpredictability of the stocks. The situation increasingly frustrates the fisherman as well as increasingly puts him at risk legally — while, simultaneously, costs of the management proc-

ess spiral upwards and the system itself becomes so dangerously Byzantine that it is incapable of practical implementation.

The final risk to be discussed is one generated by the circumstances just described above. It is touched upon by Appolonio when he decries the quality of the catch data that is obtained from fishermen. Though biologists and other fisheries managers rely heavily on such figures to establish the perimeters of the management effort, Appolonio questions the scientific utility of such data. Even if one could safely assume that industry members could provide the required data within the same statistical framework as that expected by the biologists, there are the added problems that the tracking of such regulations and paper work (1) are foreign to the fishermen and their traditional work modes; (2) violate the usual rules of secrecy about fishing that are widely maintained and have long been an integral part of the fishing mode; (3) are especially to be manipulated if the vessel has intentionally violated any of the existing regulations which the completion of the paper trail is designed to detect. Yet, it is on the basis of what is possibly (or even probably!) faulty, false, and incomplete data that, supposedly, landings are tracked, fish stocks are monitored, and new regulations are mandated. Thus, for example, from the fishermen's perspective, it is a sum-zero game. If (as has been the case since the management council process began) the fishermen near the limits of the quarterly quota for cod only halfway through that period, because 'there are so many fish out there you could walk on water!' minimizing the amount of cod they have landed, is liable to lead biologists to argue for a closure on the grounds that, obviously, the cod are in short supply. If, on the other hand, fishermen give accurate (or even inflated) figures, the managers will impose a closure on the grounds that the stocks are being fished too heavily — an especially likely response if the initial calculation was low.<sup>4</sup> 'I tell you,' said one skipper to me ruefully, 'sometimes when I think about it, my head just starts pounding from the strain of trying to figure out which way to jump.'

## Conclusion

Fishermen in many locales increasingly perceive themselves (rightly or wrongly) at risk from non-fishermen — whether they be fish buyers or processors, economists or politicians, biologists or sports fishermen, environmentalists or bureaucrats, their own nationals or that ubiquitous enemy 'the foreigners.' They are explicitly aware of their vulnerability, particularly since they admit that, as a group, they have little unity and the occupation tends to select for those who place a high value on individual decision-making. Idiosyncratic and competitive, fishermen rarely have any organized, institutionalized linkages that permit *effective* resistance to that which can erode and whittle away — or, as in the case of coastal development or nationally directed industrialization of a fishery, even dramatically and suddenly transform and dislocate — the components of their occupation and life style. Indeed, the authors of one study of the New England fishing industry summed up their perspective of the situation with what they

saw as the futile but sole response of these primary producers: "Frustrated, lost, and without hope of recourse, fishermen turn to complaining amongst themselves and their friends" (Boeri and Gibson 1976:105). These same authors see attempts to organize fishermen as doomed to founder on the rocks of the industry's traditionally atomistic structure. They cite as representative of that fragmented situation, the words of Ralph Norwood, "a politically active Maine fisherman" who announced at a fisheries conference that, to his mind, "... man has not yet advanced far enough so far that Maine fishermen can be organized like auto workers and be directed here and there by government officials telling us where and how to fish" (Boeri and Gibson 1976:105).

The difficulties of managing risk in the larger sociocultural context, one where those more usual dyads, linkages, networks and associations of fishery people discussed earlier lose much of their effectiveness, are vividly apparent to fishery people. In the summer of 1985, while discussing the problems confronting the industry, one of the men commented to me:

You wonder sometimes why you keep fighting to stay alive [i.e., keep on fishing]. The State Department negotiates away our fishing grounds; the various government agencies listen to the oil interests, the sports fishermen, the coastal developers, and the environmentalists. The minute we land our catches the lumpers [i.e., longshoremen who unload the vessels] rob us blind before our catch is weighed in. We're lucky if we meet trip expenses with money left to pay the boat mortgage, insurance, repairs and wharf fees. If we have anything left, the tax man takes it. We have no real influence here or in Washington. And to make matters worse, there's always some other fisherman trying to do you in.

In sum, those whose lives are centered around commercial fishing are still viewed by many as 'folk' on the fringe of modern societies, anachronistic hunters and foragers whose simple lives are dominated by ancient myths, traditional taboos, and irrational superstitions. This essay has attempted to show that the lives of fishermen today (even including many in the 'underdeveloped' artisanal fisheries so long as they are tied into the modern state system) are geared to dealing with the modern risks generated by the regional, national and international arenas with their complex interplay of factors representing conflicting interests of the political, economic, and environmental sectors. To most outside the industry, the details of the lives of the fishery people are irrelevant — given 'the larger issues,' the 'greater good.' To many connected with the industry — especially fishery managers — the dynamics of the stocks are of greater moment than the dynamics of the fishing communities. The occupational perimeters as well as the mode of life of the fisher people are simultaneously determined and permeated by the macro-system in which they are inextricably embedded. Each decision, whether made by the fisher people or external figures, is fraught with the risk of being futile or even counter-productive to achieving its intended results (cf. Smith 1982, 1984). In any case, the fishery communities are at risk as never before. And they know it.

## Notes

1. Support for the research in this paper was received from sabbatical funding by the State University of New York — Oswego, and research supported by the J.N. Pew, Jr., Trust and the Woods Hole Oceanographic Institution's Marine Policy and Ocean Management Center.

2. It is interesting to note that study by Poggie, Pollnac and Gersuny found that, "individuals who grew up in fishing families knew fewer taboos than those who grew up in non-fishing families" (1976:261). I would argue that this relates to the argument I make in this paper concerning the emphasis on secular risk and secular strategies to avoid such risks.

3. Fishermen are usually organized, if organized at all, into small, localized groups at best weakly linked to some national association (e.g., the Massachusetts In-Shore Draggermen's Association, the Point Judith Fishery Cooperative). They are divided by differences based on fishing zone, gear type utilized, resource exploited, and home port. In a few ports (e.g., New Bedford) there are even cleavages along ethnic lines. Unlike other countries (e.g., Canada) there are few fishermen's unions in the U.S. — and what few there are exist on the west coast.

4. Contrariwise, if the biologists point out that the landings show that the catches primarily consist of a single year class and one that is just at reproductive age (or even immature) — thus indicating that the fishermen are catching 'next year's stocks' — the fishermen will argue that the very abundance indicates that 'there are still plenty out there left to reproduce for next year.'

## References Cited

- Appolonio, S.  
1978 The New England Fishery Council: Problems and Prospects. In: *Formulating Marine Policy: Limitations to Rational Decisionmaking*. Proceedings of the Second Annual Conference held by the Center for Ocean Management Studies, University of Rhode Island, Kingston.
- Bartlett, Kim  
1977 *The Finest Kind: The Fishermen of Gloucester*. New York: W.W. Norton & Company.
- Boeri, D. and J. Gibson  
1976 "Tell it Good-bye Kiddo": *The Decline of the New England Offshore Fishery*. Camden, Maine: International Marine Publishing Company.
- Dewar, Margaret E.  
1983 *Industry in Trouble: The Federal Government and the New England Fisheries*. Philadelphia, Pennsylvania: Temple University Press.
- Douglas, Mary  
1966 *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. London: Routledge & Kegan Paul.
- Douglas, Mary  
*Risk Acceptability According to the Social Sciences*. New York: Russell Sage Foundation.
- Douglas, Mary and Aaron Wildavsky  
1982 *Risk and Culture: An Essay on the Selection of Technological and Environmental Dangers*. Berkeley: University of California Press.
- Hennessey, T.M.  
1983 *Managing Fishery Resources: The Political Economy of Fishery Regulation*. In: Hennessey, T.M. (Ed.), *The U.S. Fishing Industry and Regulatory Reform*. Wakefield, Rhode Island: Wilson Publishing Company.

- Lummis, T.  
1983 Close-up: East Anglia. In: P. Thompson, T. Wailey, and T. Lummis, *Living the Fishing*. London: Routledge & Kegan Paul.
- Matteson, G.  
1979 *Draggermen: Fishing on Georges Bank*. New York: Four Winds Press.
- McCay, B.J.  
1980 A Fishermen's Cooperative, Limited: Indigenous Resource Management in a Complex Society. *Anthropological Quarterly* 53(1):29-38.
- McPherson, R.N. (Ed.)  
1973 *Gloucester Resource Study*. Interdepartmental Student Project in Systems Engineering at the Massachusetts Institute of Technology, Report No. MITSG 74-3, Index Number 74-103-Cde.
- Moorhouse, Geoffrey  
1979 *The Boat and the Town*. London: Hodder and Stoughton.
- Mullen, P.B.  
1969 The Function of Magic Folk Belief among Texas Coastal Fishermen. *Journal of American Folklore* 82:214-25.
- Poggie, J.J. Jr.  
1980 Ritual Adaptation to Risk and Technological Development in Ocean Fisheries: Extrapolations from New England. *Anthropological Quarterly* 53(1):122-29.
- Poggie, J.J. Jr. and C. Gersuny  
1974 *Fishermen of Galilee: The Human Ecology of a New England Coastal Community*. Kingston, Rhode Island: University of Rhode Island.
- Poggie, J.J. Jr., R. Poilnac and C. Gersuny  
1976 Risk as a Basis for Taboos among Fishermen in Southern New England. *Journal for the Scientific Study of Religion* 15(3):257-62.
- Siegel, A.  
1980 *Economic Analysis Workshop for Fishery Management Plans*. Newark: University of Delaware.
- Smith, M. Estellie  
1982 Fisheries Management: Intended Results and Unintended Consequences. In: J. Maiolo and M. Orbach (Eds.), *Modernization and Marine Fisheries Policy*. Ann Arbor: Michigan Ann Arbor Science Publishers. Pp. 57-94.
- Smith, M. Estellie  
1984 The Impetus for Affluence: The 'Good Life' or Material Wealth? In: R. Salisbury (Ed.), *Affluence and Cultural Survival*. Washington, D.C.: American Ethnological Society.
- Stuster, J.  
1980 "Under the Thumb" While "One Hand Washes the Other": Traditional Market Relations in a California Commercial Fishing Community. *Anthropological Quarterly* 53(1):4-11.

## Patterns of Gear Changes in the Maine Fishing Industry

Some Implications for Management

James M. Acheson<sup>1</sup>

University of Maine

### Introduction

Many fishermen regularly switch the species they fish. Some fishermen regularly fish for different species with different kinds of gear over the annual cycle; it is a rare fisherman who has not had experience fishing for several different species over the course of his career. Indeed, the difference between financial success and failure in many cases is closely connected with the ability to change species fished as prices or the availability of various fish stocks change. Changing target species is perhaps the most important adaptive strategy used by fishermen. Despite the importance of changing gear and species, the phenomenon is not clearly understood. Fisheries managers think in terms of managing single species, as if the men who are being regulated fish for only one kind of fish. Indeed, the fact that fishermen regularly switch gear and species is obscured by the very language used in describing fishermen. One speaks of 'herring fishermen' or 'lobstermen' or 'scallopers' as if the men exploiting these species have done nothing else throughout their lives. Some men have focused on one species throughout their careers and do, in fact, have operations which would make it difficult to do anything else. The vast majority are not, however, in this position.

For those concerned with the management of marine resources, it is critical to understand the factors promoting or inhibiting changes in fishing gear. After all, the object of regulations is to change fishing patterns, with conservation of over-exploited species in mind. In many cases, this involves promoting a change from one species to another or restrictions on the use of certain kinds of gear. In some cases, management means nothing more than shifting fishing effort from one species to another. In other cases, it means putting people out of business, with all that indicates for social and economic dislocation. In all cases, exactly what will happen depends in large measure on the ability and willingness of fishermen to change gear and species sought. For this reason, an understanding of the factors governing shifting between fisheries is essential for effective and equitable regulations to the promulgated.

In this paper, we will first analyze the patterns of gear changes that have occurred in the fisheries of northern New England between 1973 and 1978 and present quantitative data to identify the factors associated with these patterns of permanent change. Second, data on fishermen's experience, their annual round and career patterns will be presented in an attempt to bring out some of the fun-