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A Fishery in Transition: The Impact of Urbanization on Florida's Spiny Lobster Fishery

COMMERCIAL FISHERMEN HAVE BEEN characterized as a homogeneous collection of economically conservative, staunchly independent individuals living in relatively rural, highly integrated communities along the coast. Several factors are presently affecting these traditional communities, changing their character and changing commercial fishing itself. These include consequences of urbanization such as the institution of zoning ordinances, increasing population densities, real estate development, and the growth of tourism and recreation. The attraction of coastal areas for retirees and others seeking a better lifestyle lead to the "gentrification" of commercial fishing. These trends affect the commercial spiny lobster fishermen of Monroe County, Florida (the Florida Keys). [social networks, urbanization, leisure and tourism, commercial fishing, social stratification]

MANY COASTAL AREAS in the United States are currently experiencing rapid population growth. This is particularly true among Sunbelt states such as Florida, where people are moving to coastal areas in large numbers. People are attracted to the coast for a variety of reasons including increasing opportunities for employment, retirement, or simply to escape climatic extremes (Miller and Ditton 1986). Such influxes of people are having a profound impact on many rural coastal communities, particularly on traditional fishing communities (Edwards 1986, 1987a, 1987b). In this article we examine related phenomena underlying the transition from rural to more suburban or urban conditions that accompany this population growth, focusing on the impact of this transition on traditional patterns of commercial fishing.

Background

Monroe County, Florida, known by most as the Florida Keys, comprises a string of low islands off the southern tip of Florida, beginning just an hour's drive

south of the Miami metropolitan area. The Keys have had a colorful history ranging from their time as a haven for pirates to a more recent historical reputation as a "getaway" for such luminaries as Ernest Hemingway. Commercial, recreational, and subsistence fishing for a variety of fish species, notably the spiny lobster, has been a mainstay of the traditional economy of the Keys.

As early as the 1940s a handful of fishermen sought spiny lobster, locally called crawfish, mostly in and around the Atlantic waters near Key West, the southernmost of the string of islands. Since that time the number of participants has grown considerably and fishing grounds have expanded to include Florida Bay, the Gulf of Mexico, and the Dry Tortugas. There are now more than six million pounds of lobster landed each year, primarily in the Keys, with a dockside value of more than \$15 million. The lobster fishery has become an economic mainstay for the fishing industry in south Florida.

In 1975 there were approximately 1,800 permits issued in the state of Florida to fish commercially for spiny lobsters. This increased to a high of 4,100 permits by 1981 but dropped back to 3,000 permits in 1982. Only recently, in 1986, the number of permits again reached the 1981 figure of 4,100. It is estimated that of the 1,544 permits issued in 1985 to Monroe County residents, only about 454 are for full-time operations (Johnson and Orbach 1987). On average, these operations use about 1,100 lobster traps each, with some using as many as 3,000. The remaining license holders include part-time commercial fishermen, recreational divers, shrimpers, and others who may or may not be commercial fishermen but who maintain a license in anticipation of possible future restrictions on participation in the fishery.

Although the vast majority of spiny lobster are caught in state waters within three miles of the shore, the fishery has been under federal management since 1982. Because of the high value of and demand for lobster and the relative ease of entry into the fishery, competition and conflict in the fishery have increased substantially in recent years. New regulations have been proposed, the social and economic impact of which, by law, must be assessed as the management regime is amended.

Our task in the larger study described below was to construct a sociocultural profile of industry participants and to use this profile to assess the impact of various policy and management options for the fishery. In the course of this study we discovered that, aside from the potential impact of future fisheries management actions, there are several other factors that will affect spiny lobster fishermen and their communities in the next few years, perhaps even more than the management regulations. In general, these factors taken together constitute a trend toward urbanization of the Florida Keys. Following a brief description of methodology, the sections below will discuss these factors.

Methodology

The data used in this article were generated as part of a larger study of the potential impacts of "limited entry," a management system under which fishing privileges are limited by any one of a variety of means (Johnson and Orbach 1987; Orbach 1980). The following are brief descriptions of the samples used to produce the primary data and other sources of ethnographic and secondary source information.

Four samples were drawn. Respondents were interviewed with a common survey instrument designed to elicit a variety of information about them and their fishing operations. The first, or main, sample ($N=75$) was drawn randomly from a list of approximately 1,544 license holders maintaining a Monroe County residence. This sample was drawn to get a representative picture of the fishery.

Since Hispanic fishermen were known to be a prominent segment of the fishery, a Hispanic sample was drawn randomly from a list of Monroe County license holders with Hispanic surnames ($N=25$). This sample was limited to fishermen who fished with more than 500 traps in order to maximize the probability of sampling a full-time commercial fisherman.

A third sample was derived with the use of snowball sampling technique (Johnson and Maiolo 1986) ($N=28$). Ten full-time commercial license holders who resided on Pine Torch Key (pseudonym), one of the principal industry bases in the Keys, were asked to name five people they talk to most frequently about commercial fishing. Those five were then asked to name five, and so on. The sample was stopped when a high degree of network closure was achieved (i.e., no new names were being mentioned of full-time commercial fishermen who fish out of or live within the Pine Torch Key community). This sample, unlike random samples, constituted a group of respondents who are related to one another in some social structural way. We should therefore see some homogeneity with respect to a number of social, demographic, and economic attributes within this group. This sample was conducted to examine more closely the characteristics of fishermen and a community outside of the two major spiny lobster fishing areas in the Keys, Key West and Marathon. The city of Marathon and the key on which it is situated—located approximately halfway between Key West and the mainland—have a relatively high level of development.

Finally, in an attempt to sample fishermen from a major metropolitan area, 25 license holders in the Miami area were randomly selected, of which we were able to contact and interview 16.

Information was also gathered through informal ethnographic interviews with commercial fishermen, county officials, fisheries managers, local residents, dealers and processors, and community leaders throughout the Keys and the Miami metropolitan area. One project participant stayed in Key West for five months and produced a separate report (Cruz 1987). Key informants, selected with the aid of the snowball sample, were used in cross-validating information.

A Fishery and Community in Transition

Zoning

Potential regulation of fishing itself is but one factor affecting the lives and industry of fishermen in south Florida. A major concern of fishermen outside of the major fishing bases of Key West and Marathon is the potential impact of the new Monroe County Land Use Plan instituted in August 1986. Key West is not included in this plan since it has its own municipal zoning ordinances, and fishermen in Marathon are less impacted by the plan because of the existing tradition of utilizing fish house facilities and the availability of commercially zoned dock and storage areas on that key.

Fishermen outside these two major locations, however, face problems concerning the loading and unloading of their boats, the storage of traps, and the building, repair, and dipping of traps in recycled oil to protect them from the harsh marine environment. Until the institution of the zoning laws, most of these fishermen fished from the backs of their houses, rented docks and storage areas or stored traps on county property. These operations took place primarily in residential areas. Under the new plan such commercial operations can only take place in industrial or commercially zoned areas, within areas designated a commercial "fishing villages," or to a limited degree in areas termed "special fishing districts," of which there are several types. Within these special district limitations generally affect the dipping and building of traps, and often limit their use to owners who reside on the property, thereby limiting the ability of fishermen to rent such property for commercial uses.

Traditionally, fishermen outside the Key West and Marathon areas are independent—that is, they do not operate under contract with major fish houses. Whereas most of the fishermen in Key West and, to some extent, in Marathon depend on dealers for dock space and trap storage areas in return for exclusive sale of their catch to the fish house, the independent fishermen of other areas generally have no access to these commercial facilities.

The effect of the new zoning laws is to limit significantly the number of places where commercial lobster fishermen can legally operate. Properties that have been "grandfathered" as exemptions to the current zoning restrictions will, over time, be eliminated once the owner sells the property or retires from fishing.

Much of the political process surrounding the development and the institution of zoning in the Keys has been influenced by the interaction of several fuzziy bounded social groups or interest groups. These groups generally divide along the lines of commercial fishermen, retirees, developers, and environmentalists, most notably. Interactions and alliances among these groups have, in the past, been dynamic in that groups, who are often in basic philosophical opposition, have joined in series of on-and-off alliances.

Socioeconomic and class differences help to define the boundaries between groups. Most notable among these have been the differences in views between commercial fishermen and retirees. Retirees as a group are better off in terms of both temporal and financial capital. The existing social stratification and consequent differences in values and attitudes have shaped the political process and will continue to shape politics in the future. In general, the more affluent retirees do not want commercial fishing neighbors for economic, social, and esthetic reasons. Thus the processes of change described here will be compounded by the political differences that are consequent to this stratification.

The land use plan for the keys has only been loosely enforced since its inception in August 1986. However, several nonresident fishermen renting property in a special fishing district that restricts use to residents only were cited in 1989 for noncompliance, pursuant to complaints by some district residents. As we shall see, such contentious behavior is reflective of stratification among commercial fishermen as well as between the major groups noted above. It is important to note that legal action in this case has been delayed because of a need to clarify the legal intent of the provision governing this particular commercial fishing dis-

frict (Ludacer 1988). The next section focuses on this special fishing district and the community of fishermen of which it is a part.

The Emergence of the "Oceaned Gentry"

Fishermen use a variety of terms to describe different types of fishermen. Many of these terms refer to an individual's commitment to commercial fishing, his "true" dependency on fishing, and his level of skill. Terms such as "full-time part-timers" or, in a derogatory vein, "school teachers" indicate a person's lack of a total commitment to commercial fishing and the fact that they have outside, nonfishing income of some type. The use of such terms is seemingly universal, at least among U.S. commercial fishermen (Miller and Johnson 1981). One particular folk classification we found in the lobster fishery was the term "gentleman fishermen."

Agricultural production and its corresponding relations, particularly in the United States, also have a part-time component. The existence of part-time small or mid-size farmers, who "fiddle" with farming while engaging in wage labor has been discussed elsewhere (Gladwin 1983). Much of the discussions surrounding such productive activities in agriculture have focused on aspects of reproduction or transformations in which simple commodity producers (family farmers) become semiproletarian (Gladwin 1989). We highlight these recent concerns in the study of agriculture in order to illustrate the contrastive nature of these examples with the one described here. As we shall see, these "gentleman fishermen"—who have income extraneous to commercial fishing—by no means fit a semiproletarian categorization. This is not to say there are no fishermen who can be categorized as semiproletarian. We found evidence of a significant number of economic strategies involving varying combinations of wage labor and small-scale fishing. These part-timers, however, generally do not have the necessary capital to purchase fishing property. In addition, their fishing operations tend to be relatively small (e.g., 200 traps vs. 1,000 traps on average for a full-time fisherman).

Lobster fishing is not a particularly complicated form of commercial fishing. Although it takes time to reach a high level of proficiency and to develop an effective fishing strategy, a newcomer with sufficient capital can be fishing with a modicum of success in a relatively short period of time.

What full-time commercial fishermen refer to when they speak of "gentlemen fishermen" in the Keys are fishermen who (1) tend to have income extraneous to commercial fishing, (2) often have access to investment capital, and (3) may engage in nonfishing activities, often of a recreational or leisure nature, that are viewed as beyond the financial capabilities of most commercial fishermen (e.g., African safaris). Such extraneous income is generally in the form of pensions and investment income such as rental property and stocks or bonds. Despite this extra nonfishing-related income, these fishermen genuinely perceive themselves as full-time commercial fishermen and the size of their operations generally reflects such a categorization.

The emergence of this class of fishermen, a process we call the "gentrification" of commercial fishing, by analogy with the gentrification of inner-city neighborhoods (Henig 1982; London 1980; Sieber 1987). Originally used to de-

scribe certain processes occurring in some European urban neighborhoods (Glass 1964), it is important to understand that features of gentrification are also present in our example.

Gentrification has generally been seen as movement into inner-city neighborhoods by a wealthier, more professional class (Henig 1982), with higher status residents replacing lower status residents in declining urban neighborhoods (London 1980). This replacement process has important implications for industrial development and political agendas (Sieber 1987). Similarly, the gentrification of commercial fishing involves the immigration of a class of financially advantaged or privileged fishery participants to the Keys, resulting in displacement and a new and moderately high degree of social stratification among fishermen. In addition, the replacement process influences the social structural character of the political process in terms of industrial, leisure, and housing development.

It is important to clarify our use of the term "class." Here we use the term deliberately to imply a number of related factors. Some have used class as a structural concept that is related to occupation, education, income, or some composite. However, such an operationalization is not in keeping with the theoretical spirit of Marx's use in which class related to control over the means of production or the labor power of others (Patnaik 1987). Structural or network analysts have argued that the arbitrary determination of class based on income or occupation should give way to more meaningful determinations based on shared relationships over time (Berkowitz 1988). In consideration of these factors, we view class in terms of social relations, capital, access to the means of production, power, and shared attitudes, cognition, or "consciousness" (Erickson 1988; Ostrander 1980; Tilly 1988). In terms of gentrification, we use the term to refer to a class of individuals who are involved in overlapping social relations, who have access to greater amounts of capital without historical linkage to commercial fishing, who have more ready access to the means of production (i.e., commercially zoned fishing property), who may wield more political power, and who share similar attitudes. Members of this class may, as an aside, have higher levels of education or income. In exploring this phenomenon we will focus on our Pine Torch Key sample.

Figure 1 is a graph of the historical participation of fishermen from the Pine Torch Key sample. Lines below the total show types of fishing activities (SP = spiny lobster, ST = stone crab, YT = yellowtail, S/G = snapper/grouper, and OT = other). Of the 28 interviewed, only 10 were fishing in 1975. The greatest influx of fishermen in this sample came in the late 1970s. Many of these fishermen came from Midwestern and Northern states such as Michigan, Ohio, and Pennsylvania, and left other careers in these places to start fishing. Some picked up commercial fishing because they could find no other employment in the Keys, while others, as we shall see, began fishing for very different reasons. Nevertheless, it is clear that the majority of participants have migrated to the area within the recent past, thus meeting one of the requisites of the gentrification distinction. The very nature of the term "class" implies the existence of differential statuses among individuals. As such, we would hypothesize the presence of social inequality among fishermen in this community with statuses being occupied by individuals of similar background, circumstance, and attitudes, or "con-

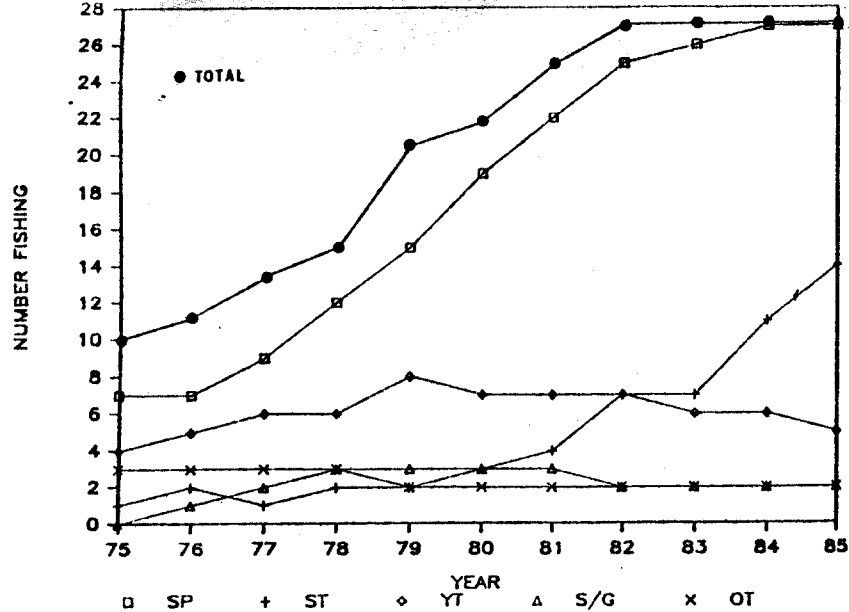


Figure 1.

Figure 1
Historical participation by Pine Torch Key fishermen.

sciousness" (e.g., we might expect the oceaned gentry to form a status of their own).

In order to examine the social stratification among the fishermen of this community, sociometric data of the type "who are the five people you talk to most often about commercial fishing?" were collected for 28 full-time commercial fishermen in the snowball sample described in the methods section. The data were used to construct a 28-by-28 binary chooser-chosen matrix reflecting the network of relations among these actors.

Figure 2 is a correspondence analysis (Greenacre 1984) of the binary matrix described above, showing the relationship among the rows of the matrix (i.e., proximities among fishermen based on patterns of citation). Correspondence analysis allows for the representation of relationships among rows and columns of a contingency table or $n \times m$ matrix in low-dimensional vector space. This figure represents a social topology based on an average linkage clustering of rows using Pearson correlation coefficients as a distance metric. Actors within a circle are structurally equivalent, occupying a particular status/role set (Burt 1982; Johnson 1986). The more that i and j have overlapping social relations, the more that i and j are structurally equivalent. Statuses are designated by S_1 , S_2 , S_3 , and S_4 .

For our expectations concerning a "class" distinction to be met, there must, first, be stratification present among members of the community and, second, gentrified fishermen should form one or more statuses of their own. This figure

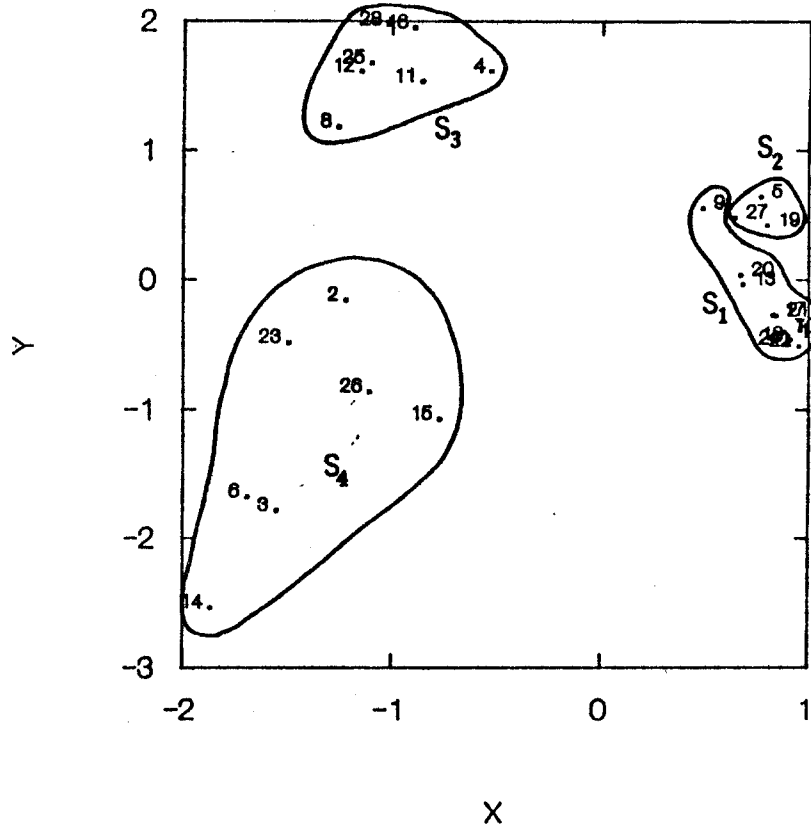


Figure 2
Correspondence analysis showing statuses among the fishermen of Pine Torch Key.

demonstrates the existence of stratification among this system of actors in that there is little disorder in its relations (Burt 1982). Each of the statuses represent reasonably clear subgroupings reflecting high degrees of similarity in patterns of relations among members of a status. In addition, all of the fishermen who could be termed "gentleman fishermen" are contained within a single status (S_1). Not only do these fishermen form a status of their own, they form one that is highly ordered and cohesive.

Figure 3 is a closer examination of this status (S_1). With the exception of actors 7, 9, and 10, the remaining actors all fit the "gentleman fishermen" distinction (denoted by a filled triangle). These fishermen, with the exception of 9, all own property in a special fishing district within the community that allows property-owning residents the use of the property for commercial fishing purposes. As noted earlier, most of these gentleman fishermen have moved to the area since the late 1970s. In addition, they are distinguished from other fishermen by their

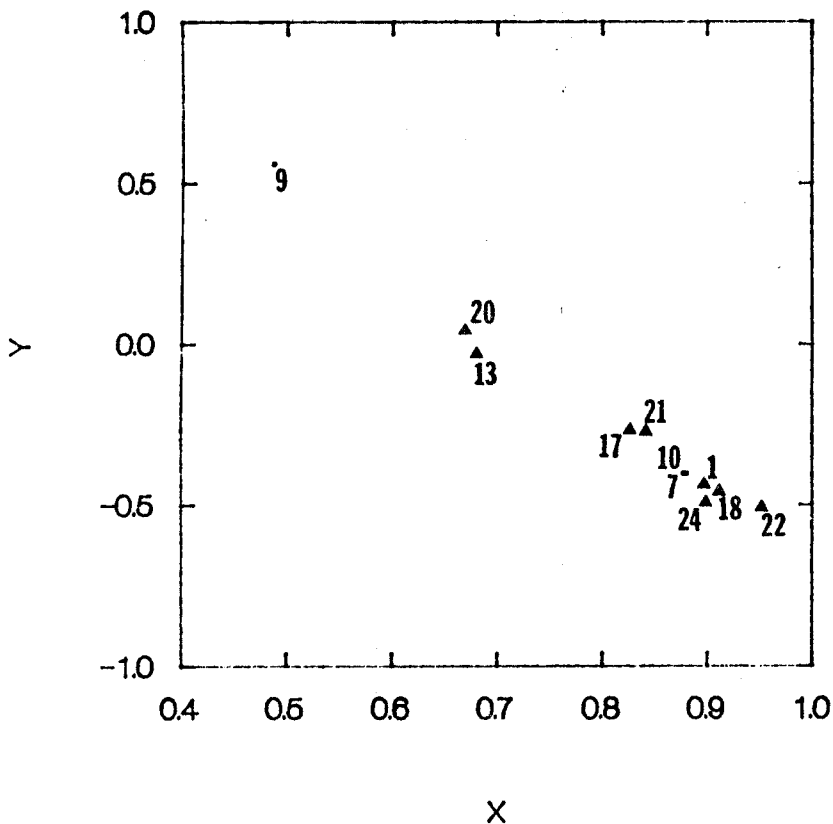


Figure 3

Closer examination of S_1 with "gentleman fishermen" identified by a triangle.

leisure activities, for example, owning an airplane. A fisherman from another status described his attempt to maintain a friendship with one of the "gentleman fishermen" largely out of their mutual interests in hunting. However, this fisherman stated he finally had to dissolve the relationship because he could not afford to engage in such things as "African safaris."

In characterizing these fishermen further, it is safe to say that they tend to be older (late 40s and up), have recently migrated to the Keys, have already experienced or retired from another career, and tend to have access to more monetary resources. Some of these have been corporate executives, engineers, and some have occupied positions such as U.S. Congressman, county tax assessor, and other public service positions.

To illustrate how differences in age and length of residence relate to status membership, and subsequently gentrification and social class, discriminant function analysis was performed. Actor's age and length of residence in the Keys

were used to predict status membership. Table 1 provides summary statistics for these variables for each of the statuses. Table 2 shows results of the multivariate tests, while Table 3 compares actual to predicted status membership based on the analysis. With the exception of status 1 (the gentrified status), there is little correspondence between actual and predicted membership. However, there is a strong correspondence between predicted and actual for status 1 membership. This follows in that we would hypothesize differences between statuses in this case to be more a function of gentrification than status since members of statuses 2, 3, and 4 would be considered to share in common terms of social class (i.e., they are commodity producers).

Figure 4 is a plot of factors 1 and 2 of the canonical scores associated with the hypothesized effect of status membership. The letters represent status membership where a = status 1, b = status 2, c = status 3, and d = status 4. Gen-

Table 1
Mean age and length of residence by status.

| | Age | Length of Residence |
|-----------------|---------------------------------------|---------------------------------------|
| Status 1 (N=11) | $\bar{X} = 55.18$ $\sigma = 9.95$ | $\bar{X} = 10.27$ $\sigma = 3.77$ |
| Status 2 (N=3) | $\bar{X} = 33.33$ $\sigma = 6.66$ | $\bar{X} = 3.58$ $\sigma = 2.45$ |
| Status 3 (N=7) | $\bar{X} = 47.33$ $\sigma = 14.17$ | $\bar{X} = 18.00$ $\sigma = 11.85$ |
| Status 4 (N=7) | $\bar{X} = 45.57$ $\sigma = 13.69$ | $\bar{X} = 10.00$ $\sigma = 5.72$ |

Table 2
Multivariate test statistics for the discriminant analysis.

| | F-Statistic | Degrees of Freedom | Probability |
|------------------------|-------------|--------------------|-------------|
| Wilk's Lambda | 0.507 | 6,44 | |
| Pillai Trace | 0.573 | 6,46 | |
| Hotelling-Lawley Trace | 0.816 | 6,42 | |

Table 3
Actual membership by predicted membership

| | | Predicted Status | | | | Total |
|---------------|---|------------------|---|---|---|-------|
| | | 1 | 2 | 3 | 4 | |
| Actual Status | 1 | 8 | 1 | 1 | 1 | 11 |
| | 2 | 0 | 3 | 0 | 0 | 3 |
| | 3 | 0 | 1 | 4 | 1 | 6 |
| | 4 | 2 | 2 | 2 | 1 | 7 |
| Total | | 10 | 7 | 7 | 3 | 27 |

economic and social circumstances, they share with one another attitudes manifested in, for example, political and leisure behavior.

First, profit in strictly economic terms may not be the principal motivation for these fishermen. The economic relationship between revenues and costs that affects the behavior of most firms may not be at work here. Basically, this is because many of these fishermen do not face the same level of economic uncertainty as the "average" commercial fisherman. Outside income can help subsidize an unprofitable commercial operation. Even under conditions of economic loss, a fishing operation will continue to operate because the fisherman is deriving psychic benefits from the activity; he may be fulfilling his lifelong dream. Nevertheless, even in operations where such nonpecuniary benefits are not the prime motivating factor, other economically motivated factors such as tax benefits may be at work. These factors all impact the ability of other fishermen to compete.

Second, this trend may continue as more people choose to retire from a career at relatively early ages, moving to the Keys to enjoy the weather and lifestyle. Part of their reasons for moving there may be to begin commercial fishing. As one fisherman put it: "You go into an area where everyone is a rancher and you want to be a rancher. You go into an area where everyone is a fisherman and you want to be a fisherman." In a number of instances individuals had purchased property as long as 20 years ago, going down occasionally for vacations and often doing a little part-time fishing. After retirement they moved to the Keys permanently and purchased a boat and traps.

Third, although these individuals certainly face the same restrictions imposed by the land use plan that might possibly limit their ability to fish, they often have the necessary capital to purchase the limited amount of residential property that has commercial fishing privileges and therefore have greater access to the means of production. In addition and as we have seen, structural differences between these and the other groups have led some resident gentleman fishermen to report noncompliance with zoning laws by nonresident renters. Thus, these complaints have focused attention on violations in this district that might have otherwise been ignored by county officials. This has also led to resentment between members of the community and the potential for conflict.

Fourth, a unique situation stems from the age distribution of this particular class of fishermen. Primarily older, these fishermen will only be able to participate in the fishery for a limited time before advancing age forces them to stop fishing. If, for example, a fisherman who owns commercially zoned residential property stops his fishing operation without selling his property to another fisherman or transferring this property to his child or other relative who will fish, the property may drop out of the pool of the already-limited residential commercial fishing properties. Thus, such phenomena could make a potential commercial fishing land shortage even worse.

Finally, the different economic and social classes of fishermen, the full-time fishermen who resemble commodity producers, the semiproleterian fishermen who mix forms of wage labor with fishing, and the gentrified fishermen all represent groups that can be engaged in competing or cooperative political conditions. For example, under some circumstances, we might expect the gentrified fisherman to share more in common with the retirees than with full-time com-

mmercial fishermen. In one such case, one or more of the gentleman fishermen pushed for and received more exclusionary zoning restrictions in a neighborhood. The neighborhood was changed from a preliminary designation as a less-restrictive commercial fishing village that was open to all fishermen (e.g., renters) to a more-restrictive special fishing district that excluded nonproperty-owning residents. There is reason to believe that the potential for political conflict of this kind will occur in the future and that the class distinctions described above will play a role in their emergence and eventual resolution.

The Cost of Coastal Real Estate and Commercial Fishing

The leisure, tourism, and resort industry has grown dramatically over the past 25 years, with the Florida Keys becoming an important leisure and tourism destination. In addition, the Sunbelt has become a popular place for people to purchase vacation property or retirement homes. Such demand has naturally affected the price of real estate in the Keys, particularly waterfront property. The amount of canal or waterfront property legally available under the land use plan for commercial fishing operations is limited and, as a result, will probably demand even higher prices.

In order to evaluate the cost of real estate, an attempt was made to gain some impressions of the value and actual asking prices for property within a special fishing district. According to one fisherman who owns property in one such district, a waterfront lot originally sold for approximately \$7,000. His estimate of the value of the lots in 1985 ranged between \$40,000 and \$50,000. More recent inquiries into the asking prices for waterfront lots within this particular district found a lot for sale for \$37,000, with some questions about the capacity to build on the lot because it may not be large enough to meet zoning requirements. A lot that meets zoning requirements would probably be even more expensive. In contrast, a similar waterfront lot reasonably close to the special fishing district but not within its borders was valued at \$25,000. A house on two lots and the owner's 34-foot boat and equipment recently went up for sale in the district. The asking price was \$350,000.

Alternatives available to commercial fishermen include purchasing commercially zoned property (BU2) not near the water for the express purpose of storing, building, and prepping traps. Property sufficient for such purposes is significantly cheaper than commercially zoned waterfront property. One fisherman who looked into such an alternative could buy the necessary property for about \$15,000 or rent similar land for between \$40 and \$50 a month. Traps could then be trucked between the storage area and the boat with the use of a trailer. This alternative, however, still did not solve the problem of legal dockage for the fishing boat or for the loading of equipment and the off-loading of the catch.

Part of the cost of entering the fishery involves the purchase of property that allows commercial fishing, and the real estate market will have a definite impact on how many and which people will be able to enter the spiny lobster fishery, or any fishery in the Keys, for that matter.

Another important aspect of increasing costs surrounding real estate is the assessed tax value of the property. Although the tax percentage has not increased to any great degree over the last few years, there have been substantial

increases in the assessed value of property. Subsequently, the amount of taxes paid by residents has been on the increase. This phenomenon affects not only those wishing to purchase property, but also those who currently own property. Thus increasing tax burdens can, over the long run, significantly increase the cost of doing business.

Tourism, Recreation, and Leisure

Johnson and Metzger (1983) recognized a general trend or transformation in coastal areas in the United States from a technical or instrumental focus (e.g., commercial fishing, commercial transport) to more of an expressive or leisure focus (e.g., recreational boating, recreational fishing, resorts). This trend has become particularly acute in some areas within the past 15 or 20 years. In many coastal locations, traditionally dominant commercial activities have been forced out by higher costs resulting from the increasing demand for waterfront property by leisure-oriented interests. Thus, canneries of fish houses have been transformed into waterfront restaurants and commercial docks have given way to leisure-oriented marinas. Although this trend has climaxed in many other coastal locations (Edwards 1986, 1987a, 1987b), it is still gaining momentum in the Florida Keys and may even affect traditionally urban commercial interests in areas such as the Miami River in downtown Miami.

In the course of the study, at least one fish-house owner who was interviewed converted his fish house and its commercial docks into a recreational marina. This trend is already evident in Key West and may soon be affecting some commercial areas on Stock Island, the key adjacent to Key West. Conversions of commercially zoned properties to recreational use will further limit the amount of dock space available to commercial operations.

Discussion

All of these phenomena—new zoning laws, the "gentrification" of fishing and its attendant social stratification, rising real estate prices, and the broader cultural trends in the coastal zone (Johnson and Orbach 1987; Meltzoff In press) are typical of the transformation of an area from rural to urban. In the case of the Florida Keys, this transformation has the clear potential for differential impact on the traditional industries and communities in the Keys—in particular the commercial fishing industry and community.

Among those groups that will probably experience a disproportional amount of these impacts are the smaller-scale fishing operations outside the major Key West and Marathon areas. There are four primary reasons for this. First, these fishermen will be initially affected by the land use plan since many of them are backyard operations on residential property. Second, most of these fishermen have worked independently (i.e., they sell their fish for the highest price) and do not have the strong connections to any one fish house that might help them in their search for a place to store their boats and traps. Thus, the displacement of many fishermen by gentrified fishermen, coupled with escalating land values, will make it difficult for these independents to purchase commercially zoned property. Finally, the conversion of commercial areas to marinas will increase

The scarcity of commercial space, exacerbating the problem. This will favor fishermen who have traditionally worked with one fish house since other fish-house owners may consider a fisherman who has always fished for a fish house more dependable or more malleable than one who has been primarily independent. This will also tend to favor bigger boats over smaller boats.

All segments of the fishery and fishing community, however, will eventually be affected. It would be safe to predict that these trends will first affect those whose fishing operations are economically marginal and who do not have the industry or community support mechanisms to augment their own resources. Eventually, however, all but the most economically productive and efficient commercial fishermen will be affected and even they will find significant new constraints on their traditional fishing activity. It is also apparent that the transitions that do occur in the Keys, in fishing as well as other sectors of the culture and economy, will be mediated by social structures of Keys communities similar to those of the spiny lobster fishermen. These structures form interlocking networks of actors, the interactions among whom will determine the direction of the social and cultural—and, by implication, economic and political—change in the Keys.

It is possible, as we have demonstrated with the spiny lobster fishermen, to trace and document these structures and networks. In the process, characteristics of the behaviors of actors such as those involved in the gentrification process become evident, and those characteristics become more easily and clearly definable. The marriage of network methodology and other social and cultural analyses can provide a powerful tool for both the assessment of the impact of public policies, such as the Monroe County land use plan, and for social scientific description and explanation.

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