# The Impacts of the Florida Net Ban on Commercial Fishing Families

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# The Impacts of the Florida Net Ban on Commercial Fishing Families

by

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## ABSTRACT

This report presents a detailed description of the methods and results of the Florida Sea Grant sponsored research on the family impacts of the Florida "net ban." Amendment 3, which was passed in November 1994 by public referendum, outlawed the use of commercial entanglement nets in state waters as of July 1, 1995.

This longitudinal research is based on data colleted from fishing families who participated in a study of family stress and coping in 1991-1993 and agreed to be re-interviewed in 1997-1998. The research discusses:

- Changes in business operations, job satisfaction and attachment, financial stress, individual stress, depression, family distress, and marital satisfaction.
- Important risk and protective factors that moderate stress for these families.
- Differences between men and women on stress outcomes in these fishing families.
- Families perceptions of the effectiveness of programs offered to help them after the net ban.

The conclusion section explains that the net ban was a traumatic event that permanently altered a "way of life" for these traditional families and fishing dependent communities, and had unintended social and environmental consequences. Nevertheless, this study showed that, at least for the selective study group, families appeared to be resilient and able to cope effectively with the net ban. This report proposes that the net ban was not a singular event but was the culmination of years of increasing pressures on the commercial fishing industry. These families had already made significant changes that enabled them to adapt to the net ban.

## PREFACE

This technical report presents a detailed description of the methods and results of the study, "The Impacts of the Florida Net Ban on Commercial Fishing Families." The Florida net ban was usually cast as an environmental issue, and its social implications were seldom discussed. This study is one of the only scientific publications to address how the net ban changed the lives of the families it affected. The authors hope that this information will be useful to policy makers and practitioners in other states that are considering eliminating entanglement nets or similar regulatory measures, as well as to social scientists studying stress and resiliency in natural resource dependent communities.

There are many people to thank for their assistance with this project. First and foremost, the authors are most grateful to the fishing families who participated in this research, before and after the net ban. They unselfishly gave hours of their time in telling us about the many changes in their work and family lives, so that others could learn from their experience.

The authors would like to thank the Sea Grant faculty and staff for their support of the projects discussed here, particularly Dr. James Cato (Director), Dr. Bill Seaman, and Dr. Marion Clarke. We would also like to express appreciation to the Florida Sea Grant and County Extension faculty for their interest and help with this research, particularly Leslie Sturmer, John Stevely, Chris Combs, Frank Lawler, Bill Mahan, Don Sweat, William Sheftall and Susan Hedge. The authors are thankful for the help of local chapters of the Organized Fishermen of Florida (O.F.F.) in contacting fishing families in their communities; and Jerry Sansom of the state O.F.F. for getting the word out about the project.

Jamie Gates, Michelle Zacks, and Michael Jepson, who were graduate students at the University of Florida at the time of the study, diligently contacted and interviewed families, transcribed interviews, and coded data. Through their hard work we were able to reach many families throughout the state. Rhonda Carwise and Jenai Collins spent hours drafting and revising this paper and we thank them for their skill in producing the final document.

This research was developed under the auspices of the Florida Sea Grant program with support from the National Oceanic and Atmospheric Administration (NOAA), Office of Sea Grant, U.S. Department of Commerce, under grant numbers NA76RG0120 (1997) and NA89AA-D-SG-053 (1991).

# THE IMPACTS OF THE FLORIDA NET BAN ON COMMERCIAL FISHING FAMILIES

## INTRODUCTION

In November 1994, Florida voters approved a constitutional amendment that outlawed the use of commercial entanglement nets in state waters. The so-called "net ban" affected an estimated 1,500-2,000 fishers and their families in coastal communities throughout the state, as well as seafood processors, restaurants, retailers and wholesalers, and other related industries.

The overall goal of this project was to provide scientific information about the family impacts of the July 1, 1995 Florida net ban. The study is based on data collected from families who participated in a study of family stress and coping in commercial fishing families in 1991-1993 (Time One) and agreed to be re-interviewed after the net ban, in 1997-1998 (Time Two). With data from the same families at two points in time, the researchers were able to compare families' functioning before and after the net ban.

As stated in the grant proposal, there were two primary objectives. Both of these objectives were met.

- Objective 1: To collect and analyze survey data from a sample of commercial inshore net fishing families to determine whether families are worse off as a result of the net ban. To identify the personal, family, and community coping processes that these families used and the resulting levels of adaptation.

- Objective 2: To describe customer satisfaction with the Florida Cooperative Extension Services educational efforts following the net ban as well as their needs for additional information, and to provide this information to Cooperative Extension Service.

Following is a review of the research literature that served as a foundation for this study, then a description of the study methods. The results are presented according to the research hypotheses. The last section discusses the conclusions and interprets the results.

## LITERATURE REVIEW

### The Florida Net Ban

The commercial seafood industry represents an important component of the Florida economy and cultural heritage. Seafood production contributes over $1 billion to the state's economy. The $200 million dockside value of fin fish and shellfish places Florida fourth among all states in annual dockside value. Furthermore, commercial seafood production is a "way of life." Commercial fishing is inextricably tied not only to personal and community identity but also to the state's historical and cultural roots (Adams 1994).

As some observers have noted, "to fully understand the magnitude of Florida's net ban, a clearer understanding of the social implication must be attained" (Korpus and Synder

unpublished manuscript, :23). The net ban had the potential to damage fishing families by eliminating their primary source of income, their family business, and a central part of their identity. The net ban also had the potential to disrupt entire communities that were dependent on commercial seafood production as a significant component of their economic base. Presumably, the results of the net ban would be similar to those seen in farming families in the midwest during the farm crisis or in other natural resource dependent communities experiencing economic and social pressures.

**Economic Transitions in Natural Resource Dependent Communities**

Communities that depend on natural resources, such as farming or fishing villages, are often thought to be harmonious and tranquil. However, contemporary studies have shown that these communities may be particularly vulnerable to instability and disruption due to the restructuring of the U.S. economy (Wagenfeld 1990; Wilkinson 1984, 1991). The 1980s and 1990s have produced particularly radical changes for the agricultural sector, including the replacement of family farms with corporate agriculture and a shift from domestic to international production and trade.

These processes have had profound effects on the economic conditions and social processes of natural resource dependent communities. Farmers went bankrupt and lost the homesteads that had been in their families for generations. Entire families lost not only their livelihoods but their history and their hopes and dreams for the future. The farm crisis drew the attention of policy makers and the public to the mental health of those dependent upon natural resources (National Mental Health Association [NMHA] 1988; Sundet and Mermelstein 1987). Dramatic events occurred such as family farm foreclosures, the involvement of noted celebrities in congressional testimony, movies and Farm Aid benefit concerts, and nationally reported suicides. These showed the American public that rural areas were not immune to the stresses of modern life and, in some circumstances were more vulnerable.

**Stress and Natural Resource Dependency**

Stress is a generic term. It has been associated with mental tension and/or strain and is generally viewed as a nonspecific response of the body to a stimulus (Geller et al. 1988; Krannich et al. 1988). The subjective feeling of stress is derived from a stimulus (stressor) and from environmental demands (Krannich et al. 1988).

Stress can manifest itself in physical outcomes. For example, stress has been shown to affect the immune, endocrine, digestive, and cardiovascular systems (Dooley et al. 1981; Pearlin 1989). Similarly, evidence suggests stress also negatively impacts mental health (NMHA 1988; Wagenfeld 1990). Alcohol and drug abuse, domestic violence, neurosis, depression, anxiety, anger, hostility, and aggression are frequently cited as some of the more common psychological impacts of stressors (Belyea and Lobao 1990; Pearlin 1989).

Studies of stress among those employed in farming, timber, and fishing are relevant here. During the farm crisis, Midwestern farmers were under great pressure. Declines in income and in available business options had major impacts on individual and family health, such as

depression, poor health, alcohol and drug abuse, domestic violence, and decreases in social well-being (Armstrong and Schulman 1990; Belyea and Lobao 1990; Heffernan and Heffernan 1986; Norem and Blundall 1988; Sundet and Mermelstein 1987; Walker and Walker 1988).

The farm crisis helped to focus popular and academic attention on these problems. However, for some time scholars have known that stress and stress outcomes, such as anxiety and depression, are present in rural farm and non-farm populations (Blazer et al. 1987; Goldsmith et al. 1988; Mazer 1983; Srole 1978; Wagenfeld et al. 1988).

Studies of the consequences of job loss in the wood products industry showed that common responses to unemployment included depression, child or spouse abuse, and alcohol and drug use. Producers felt blamed by the public for environmental destruction and betrayed by the government, even though they had upheld traditional American values centered around family, community loyalty, and hard work. They felt that they had lost a "way of life," and many individuals then felt worthless. This accumulation of stress impaired individuals' capacity to make decisions about retraining, moving, or changing occupations (Lee, Sommers, and Bliss 1991 cited in U.S. Department of Agriculture 1994; Rural Sociological Society 1990).

**Stress and Coping in Fishing Families**

Recent qualitative research with around 30 families of New England ground fishers (Mederer 1995) reported that families experienced chronic financial difficulties and psychosocial stress associated with the collapse of the ground fish industry(e.g., flounder, cod fishing). Mederer observed that economic stress produced a role reorganization within the household whereby women were more likely to be involved in breadwinning. As families suffered through changes in their traditional way of life, men mourned the change in their identity and women worried about money.

Previous ethnographic research concurred that anticipated changes in red drum regulations in the 1980s resulted in potentially devastating impacts on men's self-esteem and disrupted communication between husbands and wives, particularly regarding careers in fishing (Lampl 1986). Mederer (1995) also found that self-esteem, mastery, family cohesion, gender role flexibility, financial cut backs, job changes, and financial planning influenced family coping and resiliency.

**Impacts of Changes in Regulations Before the Net Ban**

One of the few other studies of fishing family stress and coping was conducted by the investigators and colleagues. The study took place *before the net ban* in 1991-1993. That study examined the impacts of changes in fishery regulations, which were increasing in the late 1980s and early 1990s. Face-to-face interviews with 95 couples involved in inshore net fishing were conducted in 10 Gulf of Mexico and Atlantic Ocean coastal communities.

A summary of the major findings follows (Smith 1995).

1. Families were concerned about the financial strains caused by changes in

regulations changes. These included a decrease in total income from fishing and greater difficulty paying bills. Most families were broke at the end of the month. More than one-third had reduced or eliminated expenses such as health care, health insurance, and food. This was alarming, considering that all fishers were at daily risk for severe injury and that all families had children in need of regular health care.

2. Women played a central role in reducing the impacts of financial strains with their outside employment, but this outside employment was also associated with increased family strains and decreased marital satisfaction. Because women had added paid employment to household, child care, and fishing responsibilities, they had less time to devote to family activities and had less energy to provide emotional support to their husbands. These changes were occurring at the very time when couples were experiencing increased tension about financial stability and resources. In summary, while women's work outside the home was an effective coping strategy for reducing financial stress, it may have created other problems at home.

3. When examining depression as a manifestation of stress it appeared that women, but not men, were directly affected by industry changes, such as increased regulations and decreased landings. Not only did women score higher on depression, but in path analyses there was a causal link between industry changes and women's depression. This was not true for men. This is possibly because women played pivotal roles in managing household and business finances and in providing emotional support for their husbands. In many ways they carried the burden of industry changes for their families.

4. There was considerable marital tension about whether to leave commercial fishing due to declining earnings and increased regulations. Most husbands were highly satisfied with their work, had not seriously considered other occupations, and would go into fishing again. Most had spent their adult years only in commercial fishing and had few other job skills. Few had sought job retraining or had any interest in other employment. However, these men were increasingly unable to fulfill the traditional male breadwinner role through commercial fishing, largely due to changes associated with increased regulations. On the other hand, some wives would have preferred for their husbands to escape the declining earnings and uncertainties of the future by leaving the industry.

## THEORETICAL PERSPECTIVES

Theories of individual and family stress and coping served as the organizing frameworks for this study. The basic model is presented in Figure 1. Current stress theory proposes that "protective factors," such as social support or the availability of financial resources, reduce the potential negative impacts of stressors. Stressors are also called "risk factors" because they put a person at risk of stress. Individuals have unique reactions to risk factors because they have different protective and risk factors. Both risk and protective factors often vary by individual characteristics such as age or gender (called sociodemographic factors in Figure 1). According to this conceptualization, stress is a subjective experience, perceived and defined by the individual.

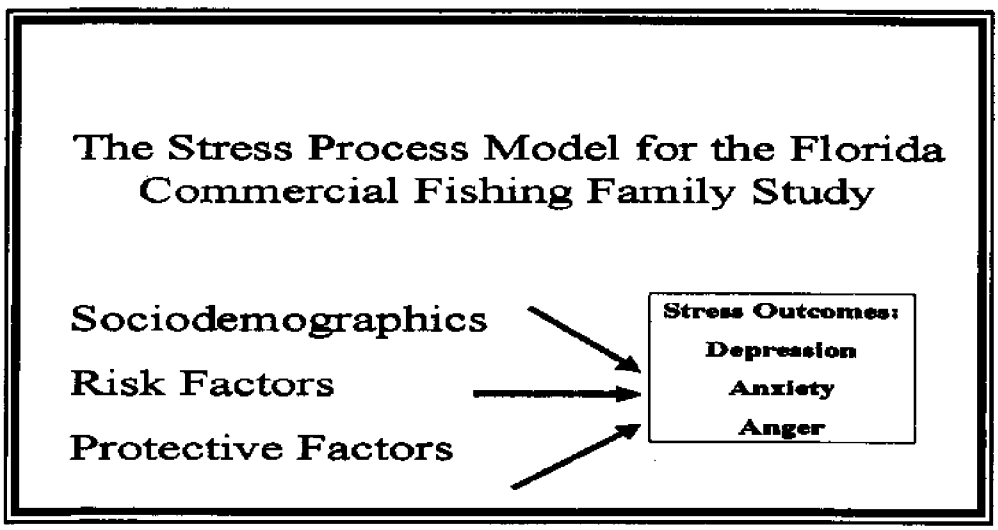


**Figure 1.** The Stress Process

Theories of family stress and coping propose that stressful life events could result in family distress. Whether the events occur as a normal part of the life cycle (e.g., having a baby) or are unexpected crises (e.g., a layoff), they can result in family or individual stress. However, intervening variables such as social support and family hardiness (i.e., sense of cohesion, problem-solving, faith in each other) could reduce the negative impacts of family stressors. This conceptual framework, the Double ABCX Model of Family Stress and Coping, was used in the Time One study and is presented in Figure 2 (McCubbin and Patterson 1983).

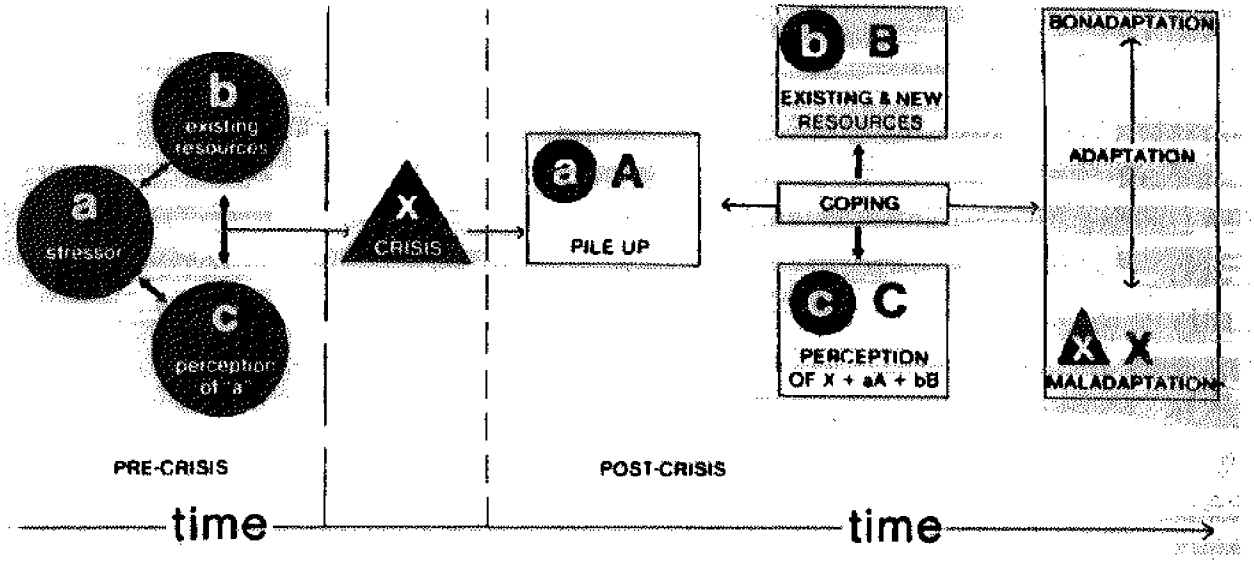


**Figure 2.** Double ABCX Model of Family Stress and Coping

Adjustment varies from maladaptation (a low level) to bonadaptation (a high level). This concept of levels of adjustment was originally proposed by Hill (1958), who suggested that, following a crisis event, there is a sudden decline in family functioning, a gradual recovery, and a final level of adjustment that may be above or below the pre-crisis level. This simple model (see Figure 3) shows that adjustment occurs over time (Hansen and Hill 1964).

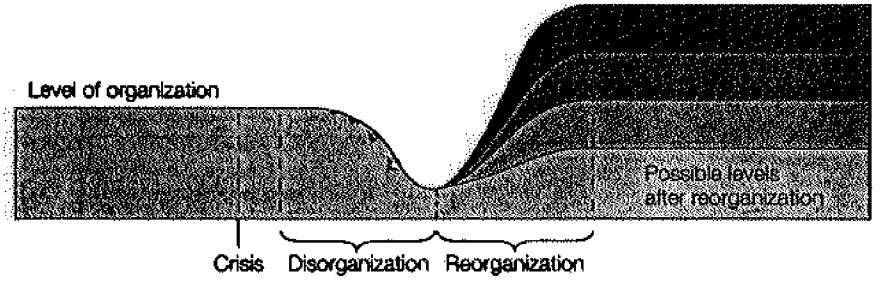


**Figure 3.** Adjustment Over Time

In recent years family scholarship has turned toward the concept of *resiliency*. Current theories of family stress and coping suggest that some families exhibit remarkable resiliency even in the face of severe hardship. According to this perspective, resiliency refers to:

1. The property of the family system that enables it to maintain its established patterns of functioning after being challenged and confronted by risk factors; ... and
2. The family's ability to recover quickly from a misfortune, trauma, or transitional

event causing or calling for changes in the family's patterns of functioning (McCubbin et al. 1997:2).

*Protective factors* help the family to endure *risk factors,* and recovery factors help them to adapt to change or bounce back when a crisis occurs. These combined resiliency factors include, for example, communication, flexibility, family cohesion, and social supports.

In summary, individual and family theories of resiliency establish that, when stress-producing events occur, they are mediated by protective factors. With adequate protection, people are able to maintain their functioning and adjust sufficiently to recover. The resiliency framework is a useful perspective for organizing the analysis of the impacts of the net ban.

## METHODS

This section reviews the study methods in the Time One (1991-1993) study as well those used in Time Two (1997-1998). This includes information about the analyses that determined that the sample at Time Two was not significantly different from the original study group on social and demographic characteristics. For a more detailed description of tests of the reliability of the measures used, please see the Appendix.

### Study Methods for the 1991-1993 Study

Since this was a study of fishing families, the sample was composed of commercial fishers, who net fished some time during the year and their spouses. Couples had at least one child under 18 living at home.

After unsuccessful attempts to draw a random sample with these characteristics from lists of salt water products licence holders, potential study participants were located through meetings held with local chapters of the Organized Fishermen of Florida (OFF) and listings of resident commercial fishers provided by these chapters. The researchers then contacted 128 eligible study participants by telephone and explained the purpose of the study. Ninety-five participants in ten coastal communities agreed to be interviewed, for a response rate of 75 percent.

## Study Methods for the 1997-98 Study

### *Study Group Selected* and *Respondent Disposition for the 1997-98 Study*

In April 1997, the investigators undertook every possible effort to locate the fishing families who had participated in the 1993 study. At least 30 couples were needed to make meaningful comparisons between Time One and Time Two *for the entire study group*. Of the original 95 families, 14 families were removed from the 1997-98 study group due to divorce, and one family due to death; four families could not be located; and eight had moved out of state. The researchers asked the remaining 68 intact families who still resided in Florida to participate in the follow-up study. Of these remaining families, 24 refused to participate or could not be scheduled, and 44 completed the process, a 65 percent completion rate (completions/eligibles).

### *Focus Groups Conducted and Pretest Questionnaire Developed*

The researchers sought assistance from former Department of Labor Seafood Information Specialists (SIS) and selected Sea Grant and Extension Family and Consumer Sciences county faculty who work with commercial fishing families. Six of these knowledgeable informants helped with the construction of survey items related to changes associated with the net ban and the effectiveness of Extension's programs.

The researchers conducted focus group interviews and personal phone interviews with these experts to better understand the difficulties fishing families were experiencing, the ways they were coping, the types of services they were utilizing, the job options they had pursued, the types of educational programs and services utilized, and the level of interest in these programs. Investigators used this information in the development of the questionnaire.

The survey instrument was based on the Time One questionnaire with additional items to tap the impacts of the net ban. The final questionnaire was reviewed by the SIS group and voluntarily pretested by two fishing families. The questionnaire was modified slightly based on the pretest results. A description of the measures used in this report is presented in the Appendix.

### *Assistants Trained*

Two skilled research assistants were hired to schedule and conduct the interviews; to code, enter, and analyze the data; and to assist with preparing the reports. Multiple training sessions improved the assistants' interviewing skills and knowledge of the industry.

### *Research Interviews Conducted*

Research assistants telephoned potential study participants to explain the project and set up an interview time. To be cost efficient, the researchers scheduled as many interviews as possible in one community during a one or two week time period. Interviews were conducted from July 1997 through March 1998.

As in Time One, in-depth face-to-face interviews were held in families' homes. One female and one male research assistant conducted each interview together. The interviewers administered the survey by reading the questionnaire items and writing down the participants' responses. Couples answered some questions together and then went to separate rooms to answer additional questions pertaining to their individual experiences. These questions were asked by the same-sex interviewer. Because many of the instruments asked the participant to choose from a number of responses, items were printed in large type on cards that were shown to the participants when the questions were asked. Answers to open-ended questions were tape recorded with permission. This report presents only the findings of quantitive data analyses.

***Survey Data Coded, Transcribed, Entered, and Analyzed***

The quantitative data were coded and entered into a database. The research hypotheses were tested using the appropriate statistic, including descriptive statistics, t-tests for the differences of means at Time One and Time Two and between men and women, zero-order correlations, and multiple regression analyses. Qualitative data were transcribed and analyzed using a qualitative data analysis software package (NUD*IST).

***Sub-Group Reliability Tested***

The 1997-98 study participants were essentially a sub-group of the 1993 study group. It is possible that the study participants in 1997-98 differed from the group that did not participate in 1997-98. To test for this possibility, a series of t-tests were conducted for important social and demographic characteristics. These results are presented in Table One.

The 1997-98 study sample was very similar to the 1993 study sample for the variables of husband's age, wife's age, husband's education, wife's education, number of years in the community, number of years as a fisher, percentage of income from fishing, and years married. Only one variable produced a statistically significant difference, the total number of family members. Families in the initial 1993 sample were slightly larger than those families who participated in both studies (4.2 and 3.9 family members, respectively). The investigators concluded that the 1997-98 sub-group is very much like the 1993 study group.

**Socioeconomic and Demographic Characteristics of the Time Two Study Group**

Of the 44 families interviewed in 1997-98, 34 (77 percent) were still actively fishing. Of these 34 families, 24 (69 percent) were fishing full-time. The men in the study who have continued to fish had an average of 25 years experience, which indicates that most began fishing as teenagers.

All of the men were employed (n=44). In addition to their primary occupation (fishing or some other type of work if no longer fishing), 12 (35 percent) held a second job (6 were full time and 6 were part time). Of those holding second jobs, 10 out of the 12 (83 percent) said the need for a second job was a result of the net ban. For the 10 men in the study who were no longer fishing, 8 indicated that the net ban was reason for their job change.

Most of the women were also working (70 percent, n=31). Of those working, 71 percent worked full time (22). Over half of these working women, (52 percent n=16) indicated that their employment was a direct result of the net ban. Almost one third (32 percent) also held a second job to help make ends meet (9 of 10 second jobs were part time). Half of these 10 women indicated that their second job was a result of the net ban. The range for average household income (including all men's and women's employment) was $30,00-$39,999.

The average number of household members was four, indicating that most couples had two children. The fathers' average age for the father was 39, and the mother's average age was 36; the oldest child's average age was 18 and the second child's average age was 13. Some families were significantly larger than two children (the range was one to five children).

Men in the study group had, on average, 11.6 years of education, which indicates that a majority are not high school graduates. The women in the study had an average of 12.8 years of education, which indicates that most have completed high school and have had some college experience. On average, the men in the study have lived in their communities for 30 years, while women have on average lived in their communities 21 years.

In summary, the Time Two study group had a long personal and family history of involvement in commercial fishing. On average, they were men and women in their mid-to-late thirties who had lived most of their lives in their home communities. The men had spent most of their adult lives working as commercial fishers and had continued in this occupation after the net ban by changing their gear for fin fish or by targeting other species. As in Time One, they placed a high value on hard work and economic self-sufficiency.

**Occupational and Financial Stress**

The study solicited information about the business effects of the net ban for those who remained in the industry. A number of business-related concerns are discussed.

***Part-time or Full-Time Fishing Employment***

Participants who were still fishing (77 percent, n=34) were asked if they considered themselves to be employed as a commercial fisher on a part time or full time basis. After the net ban (Time Two), 31 percent of those who were fishing indicated that they were fishing part time, and 69 percent indicated that they were fishing full time. At Time One, only 11 percent indicated that they were fishing part time, whereas 89 percent were commercially fishing on a full-time basis.

***Income Derived from Commercial Fishing***

The percent of family income derived from commercial fishing changed dramatically following the net ban, decreasing from 79 percent at Time One to 58 percent at Time Two. This change was statistically significant.

### *Division of Decision-making Responsibility between Men and Women*

The primary tasks associated with operating a family owned commercial fishing business are typically the responsibility of either the husband or wife. Participants were asked to indicate who was primarily responsible for decisions about certain tasks, i.e., the husband, wife, or some other person. At Time Two, there had been a shift toward *sharing decisions* for operating the boat, keeping records, and supervising crew relative to Time One. However, decisions regarding sales and marketing were more likely to be the husband's responsibility at Time Two, whereas they were shared at Time One. Nevertheless, the primary decision-making responsibility was still assumed by the husband. An exception was for decisions regarding record keeping, which remained primarily the wife's responsibility (see Table 2).

### *Time in Fishing Activities*

Participants were also asked how their time commitment (hours per week) at Time Two had changed for the same set of tasks discussed above (see Table 2). In addition, the time spent in non-fishing employment was solicited. Husbands spent significantly more time in record keeping and sales and less significantly time operating the boat. There was no statistically significant change in time spent by wives in the various tasks. However, wives did report an increase in time spent supervising crew and marketing, while their time involvement in sales decreased.

### *Fishing Business-Related Operations*

Participants indicated on a Likert type index whether business-related activities had changed (with 1 being a major decrease and 5 being a major increase) (Table 3). The average responses were compared to the Time One ratings of the same items.

Participants reported a decrease in all fishing business-related activities since the implementation of the net ban. There were statistically significant differences in Time One and Time Two responses for almost all of the items, with a significant decrease in pounds landed, income from fishing, time spent fishing, competition faced, and number of species targeted (Table 3).

### *Business-Related Coping Strategies*

Participants rated the changes in a cluster of business coping strategies that might be utilized by a commercial fishing business (Table 3). Mean responses indicated that there had been a significant increase in families' dependence on non-fishing income, and a significant decrease in all of the other strategies.

### *Job Satisfaction with Commercial Fishing*

Fishermen were asked to describe their job satisfaction by rating their enjoyment of various aspects of their fishing employment (see Table 4). They were asked, "How do you feel

about your independence as a fisherman?" The rating scale had 5 response categories (1) very dissatisfied, (2) dissatisfied, (3) somewhat dissatisfied, (4) satisfied, and (5) very satisfied.

The results of the Time One and Time Two comparisons are presented in Table 4. Before the net ban the mean for this question was 4.6, meaning that approximately half of the respondents were "very satisfied" and half were "satisfied." After the net ban, the mean for these fishermen had fallen to 2.4, meaning most were dissatisfied, while some were somewhat dissatisfied. The difference between the responses at Time One and Time Two was statistically significant.

The mean response to the question, "How do you feel about the respect you receive as a fisherman?" fell from 2.2 before the net ban to 1.7 after the net ban This statistically significant decrease indicates that fishermen, who were dissatisfied with the respect they received at Time One, were even less satisfied at Time Two. The difference in means for Time One and Time Two for the question "How do you feel about working outdoors?" was smaller (Time One = 4.9, Time Two = 4.3), but was statistically significant. Fishermen were less satisfied working outdoors than they were before the net ban.

When the fishermen were asked "How do you feel about the worthwhileness of your job?" and "How do you feel being a fisherman?" the means were high at Time One (4.8 and 4.7, respectively). After the net ban the means had dropped considerably (to 3.6 and 3.9, respectively). These differences were highly significant.

On average, fishers at Time One were somewhat dissatisfied to satisfied with what they earned during the previous year (Mean= 3.3). At Time Two, satisfaction levels had dropped, so that on average, fishermen were dissatisfied (Mean= 2.1). This change was statistically significant. Both before and after the net ban, fishermen were generally dissatisfied with their future as a commercial fisherman. The mean differences between Time One and Time Two were small and insignificant.

***Job Attachment***

As shown in Table 5, at Time One, nearly 82 percent of the fishermen in the study said they would choose to be fishermen if they had it all to do over again. At Time Two, this had fallen to 69 percent, but the change was not statistically significant. When asked if they had considered another profession, 40.6 percent said "yes" at Time One. By Time Two, this figure had risen to 62.5 percent, indicating that almost 40 percent had considered another line of work after the net ban. This difference was statistically significant. When asked at Time One, "If you could, would you stay in fishing?" nearly 85 percent responded "yes." However, at Time Two 68 percent responded affirmatively. This was a statistically significant difference.

This series of results shows that after the net ban fishermen were less satisfied with their jobs than they were before the net ban. Additionally, the second group of questions on job attachment reveals that nearly 70 percent of fishermen would choose that occupation again and if they could, would stay in fishing. Nonetheless, over 60 percent were thinking about other

professions.

**Coping with Financial Stress**

Despite the net ban, most fishing families had not made many major adjustments in household expenditures. For many living expenses, except children's expenses, the modal response was that no change had been made (Table 6). The modal "no change" items--health and life insurance, home upkeep and repair, health care, and rent and house payments--could all be considered fixed expenses or purchases families did not have at all. This suggests that these adjustments were made *prior* to the net ban as these families struggled to respond to financial pressures imposed by other fishing regulations (Smith, 1995). For example, 18 families reported that they had eliminated health insurance prior to the net ban, compared with only 5 that did so after the net ban.

Another important reason for this "no change" finding is that most of these families took advantage of some of the benefits offered by the state to cushion the financial impacts of the net ban (see Table 28). Nevertheless, many families reported that they eliminated or reduced expenditures for charity (50 percent), clothing (34 percent), and food (27 percent), and increased spending on auto upkeep and repairs (37 percent).

As shown in Table 7, most families reported that they were able to afford to meet their basic needs for food clothing, and housing. However, many lacked money for replacing furniture or household equipment, or for leisure activities, and few had money left at the end of the month. Again, it appears that the financial stressors facing these families were not significantly greater after the net ban than before, probably because families had increased their non-fishing earnings through other employment. Yet, most families reported difficulty in paying bills at the time they were interviewed.

In trying to make ends meet, fishing families relied on a variety of financial management strategies. Most couples reported that they work together to make financial decisions, cut spending when income goes down, and stretch money to meet family needs (Table 8). Few families said that they write specific financial goals, set deadlines for goals, and work with other family members to make financial decisions.

One substantial change in financial strategies emerged. Fewer families reported that they *always* know how much the family spends each year after the net ban or feel successful in managing household finances.

Almost all of these families relied solely on their earnings and few received government assistance. None were receiving temporary cash assistance or subsidized housing. Seven of the 44 families received SSI, three received food assistance and medicaid, and one family received food stamps.

## Mental Health and Family Well-Being

### *Perceived Stress*

Responses to the items on the perceived stress index showed that participants did consider themselves to be under stress at least sometimes. Table 9 shows that the majority of participants felt, at least sometimes, upset at unexpected happenings, unable to control important things, nervous and stressed, that they could not cope, angered at things outside their control, and were thinking about all the things they had to do. However, participants also felt that they were managing stress at least moderately well.

More participants felt, at least sometimes, that they could deal with life's irritating hassles, that they were coping effectively with changes, were confident in their ability to handle their problems, felt things were going their way, that they could control irritations, and that they controlled their time. Item-by-item comparisons of perceived stress at Time One and Time Two showed that there were significant differences on one item, "able to control your time," with Time Two participants feeling more in control of their time.

The most frequently reported symptoms of depression were sleeping problems and feeling low in energy (Table 10). A paired t-test comparison of each index item revealed several significant differences in certain depressive symptoms. At Time Two, fishing families (men and women combined) reported *less loneliness* (mean difference = -1.034., sd = .483), t(86) = -2.00, $p < .05$, *greater sexual interest and pleasure* (mean difference = -1512, sd = .623), t(85) = -2.25, $p < .05$, and *less hopelessness* about the future (mean difference = -1839, sd = .815), t(86) = -2.11, $p$ , .05). Comparisons of responses at before and after the net ban did not reveal any significant *overall* increase in signs of depression.

### *Anxiety at Time Two*

Responses on the Health Opinions Survey anxiety items were similar in pattern to the responses on the depression index. Most participants indicated relatively low frequencies of anxiety signs or symptoms (see Table 11). The items most frequently endorsed included a focus on the appearance of physical pain or gastro-intestinal discomfort (i.e., "Feel that you are bothered by all sorts of ailments in different parts of your body," and "Bothered by an upset stomach"). This index was not included at Time One so no comparisons can be made.

### *Anger at Time Two*

Responses to the STAXI anger index (Table 12) indicate that in general, participants did not experience feelings of anger often and usually felt in control of how they expressed anger. Contrary to popular beliefs, fishing families do not use physical violence to release anger. There is some evidence that what angered these participants was being criticized or overlooked by others for the good work they do.

### *Changes in Drinking Patterns*

Respondents retrospectively reported changes in their and their spouse's drinking patterns over the past three years, the overwhelming majority of respondents denied any change in their drinking behaviors (see Table 13). Furthermore, almost half of the sample indicated that they and their spouse do not drink.

Only seven percent of respondents described an increase in their drinking behavior over the past three years while six percent described an increase in their spouse's drinking behavior. This scale was not included at Time One so no comparisons can be made.

### *Changes in Family Stress*

Three measures of family stress were used--family stressors, family strains, and family distress. For each measure, families indicated whether or not (no or yes) they had experienced each type of stress at Time One and Time Two. In each section that follows there are two tables: Response frequencies indicating the percent of family members that experienced family stress, and the results of the tests of mean difference at Time One and Time Two.

The *family stressors* index is composed of five life events that can render a family vulnerable to later stressors or changes. The index includes the addition of a family member, changes in the work situation, and deaths and illness. Men and women indicated whether or not any of these events had happened in their family in the past year.

The frequency table (Table 14) shows a decrease in the percentage of families with members who gave birth or adopted a child and who stopped or quit work. There was an increase in the proportion of family members who started or returned to work. There was also an increase in the percentage who had a relative, close friend, or family member who became ill or injured or who died.

Table 15 shows that families had not experienced drastic changes, with one exception. There was a significant increase in the number of respondents who said that a family member had started or returned to work.

### *Family Strains*

The *family strains* index consists of four stressors of a chronic nature that can render a family vulnerable to later stressors or changes. The index includes conflict between parents and children, financial strains, unfinished tasks, and unresolved problems. As shown in Table 16, there was a decrease in the proportion of families experiencing every type of family strain.

As shown in Table 17, the one significant difference before Time One and Time Two was for financial strains. Significantly *fewer* families said that in the past year there had been an increased strain in the past year on family money for medical expenses, clothes, food, education,

and home care.

***Family Distress***

The *family distress* index in Table 18 includes four items measuring family difficulties, including emotional problems, alcohol dependency, violence, and sexual difficulties. There was a dramatic increase in the proportion of family members who had emotional problems and a significant increase in reports of a family member with emotional problems. Although there were slight increases in dependence on drugs or alcohol and in sexual difficulty, these were not significant (Table 19). There was a decline in violence but it was not significant.

***Changes in Marital Satisfaction***

At Time Two, respondents generally reported high levels of satisfaction (selecting 6-7 on a 7 point scale) with their marriage, their relationship with their spouse, and their spouse in general (Table 20). There were no significant differences in reported marital satisfaction between Time One and Time Two ( not shown).

***The Future of Fishing***

The net ban has constrained opportunities for earning a living from commercial fishing. However, couples did not increase their opposition to their children choosing this livelihood, in part because so many were opposed to their children entering commercial fishing prior to the net ban (Table 21). However, since more fishing couples expressed an opinion during the follow up interview, these views may have become more crystallized.

Since the net ban, fishing families have become more pessimistic about the future of commercial fishing. The number of men and women who rated commercial fishing's future as "hopeless" increased dramatically (Table 22). This is more consistent with their opinions about whether children should go into commercial fishing than was the case prior to the net ban.

## The Multivariate Analysis of Stress Outcomes with Demographic, Risk, and Protective Factors

In addition to comparing the stress outcomes at the bivariate level, the study examined the predictors of stress at Time Two. A series of multiple regression analyses examined the impacts of certain demographic characteristics, risk factors, and protective factors on stress outcomes, specifically depression, anxiety, and anger.

***Predictive Factors of Stress Outcomes: Gender and Age***

Gender was treated as a contrast variable, with women coded as 0 and men coded as 1. Since the study group consisted of intact couples, half of the participants were female and half were male. Other demographic factors (e.g., household income) at the household level were not

used in the analysis because the analysis is at the individual level.

The measures of risk (stressors) that were included in the equation were perceived stress, family stress, and new job due to the net ban. The protective factors included in the equation were self-esteem and mastery (see Appendix).

***Bivariate Analysis of Stress Outcomes with Sociodemographic, Risk, and Protective Factors***

The zero order correlations of the stress outcome variables (depression, anxiety, and anger) with the sociodemographic, risk, and protective factors can be seen in Table 23. The *sociodemographic factors* of age and gender were not significantly related to the depression, anxiety, and anger indices.

As expected, the *risk factors* of perceived stress and family stress had a positive relationship with the depression, anxiety, and anger indices. As perceived stress and family stress increased, respondents tended to report more stress outcomes. All of these relationships were statistically significant.

The *protective factors*, of new job, self esteem, and mastery, were all significantly related to depression, anxiety, and anger. As expected, the protective factors were negatively related to these stress outcome indices, with one exception. If a respondent had a new job as a result of the net ban, they were more likely to score higher on the anxiety index.

***The Depression Model***

The multivariate analyses shown in Table 24 begin with the depression index as a dependent variable. As for *sociodemographic factors* neither gender nor age were statistically significant. Regarding *risk factors*, the perceived stress index was related to the depression index. As stress increased, so did the depression index. This was the strongest relationship in the multivariate model, as seen in the relative size of the standardized regression coefficient (B=.517). Family stress was not significant in this model.

Among the *protective factors*, both having a new job as a result of the net ban and high scores on the self-esteem index were negatively related to the depression index. That is, when they had a new job and when they had higher self-esteem, participants were less depressed. The mastery index was not statistically significant. The adjusted $R^2$ for the model was .51, meaning that over half of the variation of the model was explained by these seven factors.

***The Anxiety Model***

As with the depression model, none of the *sociodemographic factors* were related to the anxiety outcome(Table 24). Regarding *risk factors*, perceived stress was significantly related to anxiety; as stress scores increased, there was an increase in anxiety. The other significant variables in the model were from the *protective factors*. Once again, both the new job and self-

esteem measures were negatively related to the stress outcome. In this case, self-esteem was the variable most strongly related to anxiety. Overall, the model explained 29 percent of the variation in the dependant variable.

***The Anger Model***

Turning to the anger outcome variable, the *sociodemographic factor* of gender was statistically significant. Men were more likely than women to score higher on the anger index. Other statistically significant relationships in the model were the *risk factor* of perceived stress, and the *protective factor* of mastery. As perceived stress increased, the reported anger index tended to increase. Similarly, those respondents with higher reported skills on the mastery index tended to score lower on the anger index. Overall, this model explained 34 percent of the variation in the dependant variable.

***Perceived Stress Model***

Logically, the perceived stress index was a very important variable in modeling the stress outcomes of depression, anxiety, and anger. Its importance justified further exploration of perceived stress as a dependent variable (Table 25). For this analysis, the same independent variables were used, with the exception of the perceived stress variable, which was treated as the dependent variable.

Only two factors were significant in the model, family stress and mastery. Higher reporting of family stress tended to increase perceived stress. Mastery was the strongest variable in this analysis, as seen in the standardized regression coefficients. As reported mastery scores increased, perceived stress decreased. Although only two variables in the model were statistically significant, the adjusted $R^2$ was .44, explaining a sizeable portion of variance in the model.

***Discussion of the Multivariate Findings***

The sociodemographic factors of age and gender were relatively unimportant in these analyses. Men did tend to report higher levels of anger, which is an expected outcome. What is notable in these analyses is that gender did not have a statistically significant relationship with depression and anxiety. In research on depression, gender has typically been found to be a strong predictor. That the differences between male and female depression scores were not significant when other factors were controlled is a provocative finding. It indicates that male depression is unexpectedly as high as women's and most likely is due to elevated stress levels.

For the stress outcome of depression, respondents tended to be better off if they had other employment as a result of the net ban. Outside employment is probably more reliable and likely pays better than fishing at present. However, outside employment necessitated by the net ban tends to increase reports of anxiety. Therefore, it is not accurate to say that those individuals who are forced to seek other work as a result of the net ban are any better or worse off than they were before in regard to stress outcomes. In fact, these respondents seem to be in a "catch 22"

situation. If they do not have an outside job, they tend to score higher on the depression index, and if they do have an outside job as a result of the net ban, they tend to score higher on the anxiety index.

**Gender Differences in Stress Indicators**

Unexpectedly, women and men had very similar scores on all the stress indicators (see Table 26). Very few differences in scores were seen and in fact, in only one case was a difference statistically significant. Men, as expected, scored higher on the anger index. What is notable from this analysis is the fact that differences are not seen where they would have been expected from prior research and the extensive literature. Typically, women score much higher on stress indicators then men (with the exception of anger indices). From these analyses, it seems that men are scoring unexpectedly high on stress indicators, so that their scores are very similar to those of women.

**Changes in Coping Skills**

Paired t-tests were used to explore changes in coping skills between Time One and Time Two (Table 27). Respondents at Time Two were more likely to report relying on their community (social support index) than at Time One. There was very little change observed in social coping methods such as telling problems to friends and relatives.

The family hardiness index measures how supportive the family is of the individual. As reported by the participants, this score improved from Time One, suggesting these individuals were able to handle stress better at Time Two. The mastery index also indicated that the respondents had improved their coping skills from Time One to Time Two by the perception of controlling more in one's life. Self esteem remained virtually unchanged from Time One to Time Two.

Perceived stress, which is directly impacted by coping skills, declined from Time One to Time Two, indicating less stress in the follow-up study. The differences in reported depression scores from Time One and Two are not statistically significant.

## PARTICIPATION IN PROGRAMS TO ADJUST TO THE NET BAN

One of the objectives of this research was to describe satisfaction with the assistance and educational programs offered at the time of the net ban. Customer satisfaction with the Florida Cooperative Extension Service was of particular interest and participants were asked about the net ban buy back and other benefits, as well.

### Net Buy-Back

Many fishing families participated in some assistance programs. The net buy-back program was the most widely used (Table 28). Of the 36 families who participated in this program, most said it was helpful (56 percent n=20) or very helpful (18 percent n=6). Another 12 percent (n=4) reported that the net buy-back was very unhelpful and 15 percent n=5 said it was neither helpful nor unhelpful.

Many said that the net buy-back helped but the compensation was inadequate. For example, one family commented; "helped some, rather than discarding them. Only paid 3/4 of the money they were supposed to get. Didn't pay what the nets were worth." Another said, "Helped pay bills, [but I'm] dissatisfied with the amount, 10¢ on the dollar." A third said, "Got back half of what he should have--they cut off funds. Didn't get back what the voucher said he was supposed to." Some noted that the program was not well administered and inadequately funded, and some fishers took advantage of loopholes or cheated--which cost others. "Seine net sellers adding a pocket to the net sucked up all the buy-back money" commented a fisherman. Another said about his situation, "Ones that had 2 or 3 different kinds of fishing, gill net, shrimping, etc., got screwed." They, too, were forced to get out of commercial fishing but could not recoup equipment costs from their other operations.

### Unemployment Benefits

Most of the 26 families who obtained unemployment benefits said this program was very helpful (42 percent n=11) or helpful (42 percent n=11). Of the 14 fishermen and spouses who participated in job training, 86 percent (n=12) said this was helpful or very helpful. Responses by the 9 fishermen and spouses to aquaculture training also were positive, with 78 percent (n=7) saying it was helpful or very helpful and 22 percent (n=2) saying it was very unhelpful. In a few cases, fishermen who fished part-time and held other jobs were ineligible for aquaculture or job training programs. Responses of the seven families who obtained direct assistance were mixed, with three reporting it was very helpful, three neither helpful or unhelpful, and one that it was very unhelpful.

### Florida Cooperative Extension

Nearly two-thirds (64 percent) of the families obtained information from the Florida Cooperative Extension Service (CES). The Florida CES provided a range of services that varied from county to county, including in-depth educational programs on aquaculture, development of service networks (such as in Lee County), and a comprehensive set of fact sheets in the *Fishing*

*Family Handbook* (2,500 copies were printed and distributed). CES professionals participated in many of the "One-stop" programs that were implemented for displaced fishers and they distributed a large number of handbooks in 1995 (*CES annual reports for county faculty were reviewed for FY95 and FY96 to identify the scope and impact of net ban-related programs*). Several CES agents reported that about half or fewer of the families picked up the handbook during the one stops. Of the families that obtained information from Extension, most got information on clam farming and other aquaculture topics. Several families mentioned CES agents by name and praised the county agent's work.

Although most fishermen and spouses were satisfied (39 percent) or very satisfied (21 percent) with Extension's information they obtained, others were dissatisfied (14 percent), very dissatisfied (7 percent), or neutral (18 percent). Even when a fishermen said that he or she was satisfied, the comment was often qualified. For example, one person said, "Satisfied, but they treated us like a bunch of wetbacks. It's like dreaming about being a doctor without having any scholarships." Another was satisfied with information on clamming but very dissatisfied with that on jellyfish, saying, "Didn't give enough information." One fisher who was very dissatisfied said, "Sent too late for me ... not possible for me to implement. Sent out to look good to the public."

Families clearly had mixed reactions to the *Fishing Family Handbook*. One person commented on the handbook saying, "It didn't pertain to fishing, didn't pertain to us, didn't get anything out of it; [I was] kind of disappointed in it." Another presented a different viewpoint, "Satisfied, I used segments of it."

Although some fishers and spouses said the information provided by Extension (e.g., aquaculture) was good, other factors prevented them from using it. For example, they lacked the financial resources to start an aquaculture enterprise. A fisherman said, "The information itself was extremely helpful. Didn't have the money to get into it." Another said, "Couldn't use it, what good did it do?" Another said (concerning clamming), "Live too far from the water and the water here is too polluted for clams. State has a lot in input, regulations--don't want that."

These comments suggest that there was insufficient coordination with other agencies to assemble the complete technological package. Information, equipment, start-up capital, and property to buy or lease were all necessary to facilitate adoption (Brown 1981).

Some families also provided information about the types of assistance that they could use now. One family indicated that they could use help with job training for the wife and aquaculture for the husband. Aquaculture topics were mentioned by several families. One person wanted information on roe marketing and obtaining low-interest loans. Another family needed assistance in identifying non-aquaculture jobs on the water. Additional areas mentioned included counseling, community organizing, obtaining grants, food stamp assistance, agricultural opportunities, and equipment buy-backs.

Other families said they didn't want any help. "We're not that type, we work hard" said one couple. Another said, "No, don't want their help, only people that work the system get it."

This suggests that efforts to assist fishing families should avoid a "social service" image to their programs.

These mixed reactions to Extension efforts have provoked considerable discussion and reevaluation of how information was disseminated and the ways CES could have improved outreach to fishing families. To some extent, families' negative reaction to Florida Cooperative Extension Service programs are probably tied to the effectiveness of related programs such as the net buy-back and Harbor Branch Institute's limited aquaculture efforts. This created an environment where it would be difficult for CES to succeed.

However, the net ban also challenged CES to adopt a different outreach strategy. Unfortunately, the Florida CES efforts in response to the net ban followed a more traditional information dissemination model that was not adequate for this situation. The net ban was unlike other situations that Extension typically addresses: It was a sudden, crisis situation affecting thousands of people; it was highly politically charged; there were many other key agencies involved in offering assistance. Furthermore, the magnitude and scope of the net ban impacts were not fully recognized or appreciated by the public or policy makers. The end of inshore gill netting came unexpectedly, literally overnight, with the casting of citizen ballots. Although, families had several months to "prepare" for the net ban implementation, they were shocked, angry, and in a state of disbelief which made it difficult to accept their situation. Thus, the net ban could probably be compared to a natural disaster with the predictable stages of disorientation, grieving, and recovery that take considerable time to unfold.

In retrospect, the CES could have followed or modified models for managing and responding to crisis situations. This would include the following steps.

- Adopt an in-depth, comprehensive outreach approach to respond to family needs and to provide follow-up programming. This ensures that a family's needs are met (including arranging for the complete package of assistance). The success of this approach was well-documented for families during the farm crisis in the mid-1980s, where CES agents and specialists worked one-on-one with farm families to help them assess their farm's future, identify alternative employment opportunities, and deal with stress.

- Identify users' information needs before educational programs or materials are offered. Some respondents reported that the information in the *Fishing Family Handbook* was not appropriate. On the other hand the information may have been appropriate but the delivery strategy may not have been suitable (see personalized strategy above).

- Coordinate outreach programs with other agencies providing services, as per disaster intervention.

- Given the rate of involvement (64 percent of a fairly small and identifiable audience), increase the effort directed to clientele recruitment (getting customers aware of Extension information and resources) and reducing costs of obtaining information (customers time, effort and money)

Although the net ban crisis has passed, these finding may be applied to other states considering outlawing entanglement nets or introducing similar measures. In addition, these findings may be relevant to programs targeted at other groups in crisis or natural resource disaster situations.

## WHAT WE LEARNED FROM THIS RESEARCH

Three broad themes emerged from this study. First, and most importantly, the net ban was a traumatic event in the lives of commercial fishing families that caused a radical shift in the way they conducted business and organized their households. Second, the net ban has created a significant cultural loss in the state of Florida. Third, there are many unintended economic and environmental consequences to the net ban that have not yet been fully realized.

### A Traumatic Event

There is a popular misconception that the net ban was an isolated, albeit traumatic, event in the lives of commercial fishing families. The net ban did hurt commercial fishing families, and almost a quarter of our respondents left the industry between the two study periods. However, the net ban was, in some ways, the culmination of a progressively more restrictive series of regulations. In response to this pile up of changes, families reorganized in virtually every sphere. We now have evidence that these commercial fishing families had already made significant adjustments to their business operations, household budgets, and gender roles *prior* to the net ban, as the result of increasing fishing regulations and restrictions. These findings support the theoretical framework illustrated in Figure 2.

The net ban was not widely anticipated by commercial fishing families. Nonetheless, prior to the net ban families were *already* actively coping with changes induced by increased fisheries regulations. Most commercial fishing families in our study group already were dependent upon non-fishing income to make ends meet. This non-fishing income came almost exclusively from women, who had entered the workforce in the late 1980s. In many ways, this familial arrangement mirrors that of the broader society, and in that sense would not be cause for particular concern. Nevertheless, there are some important factors to consider.

This transformation of the traditional household structure had occurred several decades later than that of the broader society. Commercial fishing families had been able to resist this broader trend, out of necessity and tradition. A commercial fishing family is not only a family but also a seafood production business. Male identity and role in this particular family structure had been dependent upon being the sole breadwinner and household head. The traditional role of wives and children was to support the central activity of fishing.

The financial restructuring that necessitated women entering the workforce created a great deal of family strain just prior to the net ban and this registered clearly in our initial study. Commercial fishing families struggled as the family division of labor changed. Men were now, in a sense, dependent upon their wives' income to continue fishing and to adequately support the family. Though women in the study worked an average of about 25 hours a week, there was little evidence that the
division of labor within the house had changed to accommodate women's hours in outside employment. Women worked out of the home, but were responsible for most chores within the household as well as traditional fishing support activities.

This put a great deal of stress on families as they tried to adjust to this new reality. By the

time we interviewed them after the net ban, the families had made some further adjustments, and in general, marital satisfaction had improved. However, the division of labor at Time Two still mirrored that of Time One, with women working outside the home and doing a majority of household work.

Fishing families are starting to resemble the majority of families within the broader society. Many would be inclined to say that this change was inevitable. In fact, that may be true, but this does not diminish the struggle that these families face as they restructure their entire family and work life. This is a family and work life, that in most cases, has existed for multiple generations.

It is not surprising that these changes have produced significant consequences in the well being of commercial fishing families and their broader communities. This has included the loss of a way of life. Commercial fishing is an important part of Florida's cultural heritage. For us, the analogy of losing the family farm seems appropriate here, but there has been little hand-wringing over the loss of the commercial fishing family's way of life.

**Loss of Florida's Cultural Heritage**

We had heard that "taking the commercial fisherman out of Florida is like taking the cowboy out of Texas." For many, the American cowboy represents rugged individualism, a man pitted against the elements. He is tired and weathered, but formidable and resilient. Contrary to this stereotype, all members of commercial fishing families are involved in production, not just the fisherman. In fact, most fishermen were dependent upon their wives' non-fishing income to continue fishing. In addition, according to the stereotype, violence should have been endemic, especially given the stress these families faced. However, the families in our study reported little incidence of domestic violence or of substance abuse. Instead, these fishing families were stable and resilient in the face of great change, able to initiate effective coping processes (see Figure 1).

Despite these internal strengths, increased regulations coupled with the net ban, and now continuing restrictions have combined with societal forces to change these families forever. Natural resource production occupations, such as commercial fishing families and family farms, are perhaps the last sector of the economy where the traditional family is also an economic unit. Traditional family structures have aided economic production in extractive jobs. Now fishing and farming can
only rarely support a family and its labor resources. What we have lost is not the commercial fisherman, but rather a stable and traditional family structure that supported local seafood production and helped form the identity of the local community.

As a number of observers have argued, the net ban was a social issue, one that reallocated a resource from commercial to recreational usage. Our findings suggest that the burden of this reallocation was borne by the commercial fishing families. In addition, this reallocation has changed local fishing communities in previously unimagined ways, by impacting the structure of local economies, the image of the local community, and the visual and landscape/seascape. Fewer people are now commercial fishing, and there is less need for businesses related to

commercial fishing within the community. In contrast, recreational fishing and supporting businesses are growing . It is obvious; recreational and tourist enterprises look very different from commercial operations. Work boats and fish houses are distinct from fiberglass recreational boats and bait shops. A working dock has a different feel than that of a fishing pier. We expected that many of these communities no longer have a commonly held image of a fishing village.

There has been a significant cultural loss in the passing of the traditional way of life for Florida's commercial fishing families and communities. However, these families have shown great resourcefulness in continuing in an industry (and consequently a way of life) that has not been kind to them in recent years. It seems likely that fishing families will prevail, but not in the numbers we have seen in the past, nor will they look like they once did.

**Many Unintended Consequences of the Net Ban**

The Florida net ban was passed as a constitutional referendum and made law as a consequence. The dramatic referendum campaign left many unprepared for the aftermath. The net ban forced fishing families to change expensive fishing gear immediately or leave the industry. To help ease this burden, the state of Florida spent untold millions of dollars in a net buy back program, direct assistance, unemployment, and job retraining. In spite of these tremendous resources, these programs for the most part failed to meet the needs of many of the families in our study. This was due primarily to a lack of coordination among agencies (although there was the so called one-stops), and a lack of start-up capital for alternative enterprises, such as aquaculture. These fishing families still have significant unmet needs as a result of the net ban. The actual cost of the net ban to the citizens of Florida, to our knowledge, has never been fully calculated or disclosed, but the amount is very substantial based on what public information we were able to find.

Aside from being very expensive, the net ban may be actually increasing pressure on the marine environment. Prior to the net ban, mullet was the primary targeted species and many other diverse secondary species were also harvested. Our research shows that most fishing families have remained in fishing but now target specific species, such as stone and blue crab, more intensely than in the past. Now, some are suggesting that there is a need for increased regulations to protect these intensely targeted species. This will probably refocus or intensify commercial efforts on yet another species as these families struggle to retain their way of life. At this point, it is likely that this pattern will repeat itself numerous times.

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**Table 1.** Tests of Social and Demographic Differences in Time One and Time Two Study Groups

| Variable | Group | Mean | T Value | 2-Tail Probability |
|---|---|---|---|---|
| Husband's Age | Time One | 40.0 | 1.07 | Not Significant |
| | Time One and Two | 38.6 | | |
| Wife's Age | Time One | 36.1 | .21 | Not Significant |
| | Time One and Two | 35.8 | | |
| Husband's Education | Time One | 11.1 | -.60 | Not Significant |
| | Time One and Two | 11.3 | | |
| Wife's Education | Time One | 11.5 | -1.91 | Not Significant |
| | Time One and Two | 12.1 | | |
| Number of Family Members | Time One | 4.2 | 2.33 | .021 |
| | Time One and Two | 3.9 | | |
| Number of Years in the Community | Time One | 28.8 | -1.47 | Not Significant |
| | Time One and Two | 31.8 | | |
| Number of Years as a Fisher | Time One | 22.4 | -.16 | Not Significant |
| | Time One and Two | 22.6 | | |
| Percentage of Income from Fishing | Time One | 71.0 | -.92 | Not Significant |
| | Time One and Two | 74.5 | | |
| Years Married | Time One | 12.9 | -1.57 | Not Significant |
| | Time One and Two | 15.1 | | |

**Table 2.** Frequency Distribution for Primary Decision Making in Business-Related Actions.

| | Time One | | | | Time Two | | | |
|---|---|---|---|---|---|---|---|---|
| | Husband | Wife | Both | Other | Husband | Wife | Both | Other |
| Operating Boat | 97.7% n=(43) | | 2.3% n=(1) | | 91.4% n=(32) | — | 5.7% n=(2) | |
| Record Keeping | 25.0% n=(11) | 68.2% n=(30) | 4.5% n=(2) | 2.3% n=(1) | 25.7% n=(9) | 54.3% n=(19) | 17.1 n=(6) | 2.9 n=(1) |
| Supervising Crew | 85.7% n=(36) | | 7.1% n=(3) | 7.1% n=(3) | 87.5% n=(21) | | 8.3% n=(2) | 4.2% n=(1) |
| Sales | 54.5% n=(24) | 4.5% n=(2) | 11.4% n=(5) | 27.5% n=(11) | 82.9% n=(29) | 8.6% n=(3) | 8.6% n=(3) | |
| Marketing | 43.2% n=(19) | | 13.6% n=(6) | 43.2% n=(19) | 65.6% n=(21) | 6.3% n=(2) | 9.4% n=(3) | 8.8% n=(6) |

**Table 3.** Changes in Business-Related Activities.

| Variable | Mean Response | | Difference Between Time Periods | |
|---|---|---|---|---|
| | Time One | Time Two | T-value | Prob (2-tailed) |
| Hours Spent on Various Tasks / Week | | | | |
| - Operating Boat | | | | |
| Husband | 61.7 | 38.0 | 4.28 | .000 |
| Wife | 1.6 | 1.5 | 0.07 | .942 |
| - Record Keeping | | | | |
| Husband | 0.8 | 1.6 | -2.79 | .009 |
| Wife | 1.7 | 1.7 | -0.03 | .979 |
| - Supervising Crew | | | | |
| Husband | 26.5 | 14.3 | -2.79 | .053 |
| Wife | 0.4 | 1.34 | -0.79 | .433 |
| - Sales | | | | |
| Husband | 1.2 | 5.4 | -2.93 | .006 |
| Wife | 2.4 | 1.7 | 0.56 | .578 |
| - Marketing | | | | |
| Husband | 0.6 | 1.8 | -1.82 | .078 |
| Wife | 0.2 | 0.9 | -1.42 | .166 |
| - Non-fishing employment | | | | |
| Husband | 6.0 | 12.0 | -1.65 | .109 |
| Wife | 25.0 | 24.9 | 0.02 | .987 |
| Business-Fishing Related Activities (*Likert scale responses; 1 major decrease - 5 major increase*) | | | | |
| - Pounds landed | 2.3 | 1.2 | 4.75 | .000 |
| - Total income from fishing | 2.5 | 1.4 | 4.22 | .000 |
| - Regions fished | 3.0 | 2.5 | 1.54 | .133 |
| - Time spent fishing annually | 3.4 | 2.1 | 4.81 | .000 |
| - Ability to sell catch | 2.8 | 2.5 | 0.81 | .413 |
| - Competition faced in market | 4.2 | 2.8 | 4.28 | .000 |
| - Number of species targeted | 2.7 | 1.6 | 4.97 | .000 |
| Use of Business-Related Coping Strategies (*Likert scale responses; 1 major decrease - 5 major increase*) | | | | |
| - Dependence on non-fishing income | 3.5 | 4.2 | -4.04 | .000 |
| - Record keeping needs | 3.8 | 3.0 | 3.92 | .000 |
| - Sales/marketing time | 3.3 | 2.8 | 2.05 | .048 |
| - Use of non-family hired labor | 3.0 | 2.2 | 2.82 | .008 |
| - Time in trade association meetings | 4.0 | 2.2 | 6.21 | .000 |
| - Use of loans and other credit | 3.6 | 3.2 | 1.12 | .269 |
| - Use of family labor | 3.3 | 2.7 | 2.22 | .033 |
| - Purchase of new equipment | 3.7 | 2.8 | 3.47 | .001 |
| - Greater role by family members | 3.5 | 3.1 | 2.32 | .026 |

**Table 4.** Changes in Job Satisfaction with Commercial Fishing.

| Variable<br>How Do You Feel About: | Time | Mean | T Value | 2-Tail Probability |
|---|---|---|---|---|
| Your Independence as a Fisherman? | Time 1 | 4.6 | 7.25 | .000 |
| | Time 2 | 2.4 | | |
| The Respect You Receive as a Fisherman? | Time 1 | 2.2 | 2.26 | .030 |
| | Time 2 | 1.7 | | |
| Working Outdoors? | Time 1 | 4.9 | 2.84 | .008 |
| | Time 2 | 4.3 | | |
| Worthwhileness of Your Job? | Time 1 | 4.8 | 4.29 | .000 |
| | Time 2 | 3.6 | | |
| Being a Fisherman? | Time 1 | 4.7 | 3.34 | .002 |
| | Time 2 | 3.9 | | |
| What You Earned Last Year? | Time 1 | 3.3 | 5.02 | .000 |
| | Time 2 | 2.1 | | |
| Your Future as a Fisherman? | Time 1 | 1.6 | .72 | Not Significant |
| | Time 2 | 1.5 | | |

**Table 5.** Changes in Job Attachment.

| Variable | Time | Mean | T-Value | 2-Tail Probability |
|---|---|---|---|---|
| Would You Become a Fisherman if You Had it to do Over Again? | Time 1 | 81.5 | 1.68 | Not Significant |
| | Time 2 | 68.7 | | |
| Have You Considered Another Profession? | Time 1 | 40.6 | -2.52 | .017 |
| | Time 2 | 62.5 | | |
| If You Could, Would You Stay in Fishing? | Time 1 | 84.7 | -2.03 | .050 |
| | Time 2 | 67.5 | | |

**Table 6.** Changes in Household Living Expenses.

| | Time One Responses | | | | Time Two Responses | | | |
|---|---|---|---|---|---|---|---|---|
| Type of living expense | Eliminated %(n) | Reduced %(n) | No change %(n) | Increased %(n) | Eliminated %(n) | Reduced %(n) | No change %(n) | Increased %(n) |
| Health insurance* | 40.9% (18) | 6.8% (3) | 43.2% (19) | 9.1% (4) | 11.4% (5) | 13.6% (6) | 59.1% (26) | 15.9% (7) |
| Life insurance* | 22.7% (10) | 4.5% (2) | 61.4% (27) | 11.4% (5) | 6.8% (3) | 9.1% (4) | 65.9% (29) | 18.2% (8) |
| Charitable contributions | 22.7% (10) | 18.2% (8) | 47.7% (21) | 11.4% (5) | 15.9% (7) | 34.1% (15) | 36.4% (16) | 13.6% (6) |
| Home upkeep and repair | 6.8% (3) | 22.7% (10) | 40.9% (18) | 29.5% (13) | 4.5% (2) | 20.5% (9) | 54.5% (24) | 20.5% (9) |
| Health care | 2.3% (1) | 27.3% (12) | 45.5% (20) | 25% (11) | (0) | 13.6% (6) | 65.9% (29) | 20.5% (9) |
| Food | (0) | 38.6% (17) | 31.8% (14) | 29.5% (13) | (0) | 27.3% (12) | 43% (19) | 29.5% (13) |
| Auto upkeep and repair | (0) | 18.2% (8) | 31.8% (14) | 50% (22) | (0) | 18.2% (8) | 13.2% (19) | 38.6% (37) |
| Rent, house payments | (0) | 13.6% (6) | 50% (22) | 36.4% (16) | 2.3% (1) | 2.3% (1) | 72.7% (32) | 22.7% (10) |
| Children's expenses | (0) | 11.4% (5) | 18.2% (8) | 70.5% (31) | 9.1% (4) | 18.2% (8) | 22.7% (10) | 50% (22) |
| Clothing | (0) | 29.5% (2) | 31.8% (14) | 38.6% (17) | (0) | 34.1% (15) | 43.2% (19) | 22.7% (10) |

* $p \leq .05$

**Table 7.** Changes in Ability to Afford Household Expenses.

| Expenses | Time One Responses | | Time Two Responses | |
|---|---|---|---|---|
| | Yes can afford %(n) | No can't afford %(n) | Yes can afford %(n) | No can't afford %(n) |
| A suitable home | 72.7% (32) | 27.3% (12) | 88.6% (39) | 11.4% (5) |
| Replacement furniture or equipment | 52.3% (23) | 47.7% (21) | 50% (22) | 50% (22) |
| A suitable car | 54.5% (24) | 45.5% (20) | 65.9% (29) | 34.1% (15) |
| Food | 90.9% (40) | 9.1% (4) | 93.2% (41) | 6.8% (3) |
| Clothing | 75% (33) | 25% (11) | 81.8% (36) | 18.2% (8) |
| Leisure activities | 13.6% (6) | 86.4% (38) | 22.7% (10) | 77.3% (34) |
| Have money left over at the end of the month | 22.7% (10) | 72.7% (32*) | 15.9% (7) | 84.1% (37) |
| Difficulty paying bills at this time of year | 77.3% (34) | 18.2% (8*) | 68.2% (30) | 31.8% (14) |

* 2 missing responses.

**Table 8.** Changes in Strategies for Managing Money.

| Strategy | Time One Responses | | | | Time Two Responses | | | |
|---|---|---|---|---|---|---|---|---|
| | Never %(n) | Sometimes %(n) | Often %(n) | Always %(n) | Never %(n) | Sometimes %(n) | Often %(n) | Always %(n) |
| Work with other family members to decide use of money | 43.2% (19) | 27% (12) | 15.9% (7) | 13.6% (6) | 27.3% (12) | 40.9% (18) | 18.25 (8) | 13.6% (6) |
| Write down specific financial goals | 38.6% (17) | 36.4% (16) | 11.4% (5) | 13.6% (6) | 50% (22) | 27.3% (12) | 13.6% (6) | 9.1% (4) |
| Save money for emergencies | 29.5% (13) | 24.5% (13) | 18.2% (8) | 18.2% (8) | 25% (11) | 24.5% (13) | 22.7% (10) | 22.7% (10) |
| Set deadlines for reaching specific financial goals | 29.5% (13) | 20.5% (9) | 27.3% (12) | 27.7% (10) | 29.5% (130) | 31.8% (14) | 29.5% (13) | 9.1% (4) |
| Plan spending and follow the plan (stick to a budget) | 27.3% (12) | 20.5% (9) | 18.2% (8) | 34.1 (15) | 25% (11) | 20.5% (9) | 25% (11) | 29.5% (13) |
| Make a record of what is spent to see what your spending pattern is | 18.2% (8) | 27.3% (12) | 22.7% (10) | 31.8% (14) | 20.5% (9) | 22.7% (10) | 27.3% (12) | 29.5% (13) |
| Come up with new ideas for making money when necessary | 9.1% (4) | 31.8% (14) | 34.1% (15) | 25% (11) | 9.1% (4) | 31.1% (15) | 27.3%(12) | 29.5% (13) |
| Feel successful at managing household finances | 0 | 29.5% (13) | 36.4% (16) | 34.1% (15) | 9.1% (4) | 31.8% (14) | 31.8%(14) | 27.3% (12) |
| Evaluate the way you spend money | 2.3% (1) | 13.6% (6) | 34.1% (15) | 50% (22) | 2.3% (1) | 18.2% (8) | 31.8% (14) | 47.7% (21) |
| Are aware of how values/beliefs can influence spending | 6.8% (3) | 11.4% (5) | 25% (11) | 54.5% (24) | 9.1% (4) | 22.7% (10) | 25% (11) | 43.2% (19) |
| Know how much your family spends each year | 4.5% (2) | 15.9% (7) | 15.9% (7) | 63.6% (28) | 15.9%(7) | 22.7% (10) | 20.5% (9) | 40.9% (18) |
| Work together with spouse to decide use of money | 4.5% (2) | 11.4% (5) | 15.9% (7) | 68.2% (30) | 4.5% (2) | 9.1% (4) | 13.6 (6) | 70.5% (31) |
| Stretch money available to meet family needs | 2.3 (1) | 9.1% (4) | 18.2% (8) | 70.5% (31) | 6.8% (3) | 9.1% (4) | 25% (11) | 59.1 (26) |
| Cut spending when income goes down | 0 | 6.8% (3) | 22.7 (10) | 70.5% (31) | 0 | 9.2% (4) | 27.4% (12) | 61.4% (27) |

**Table 9.** Response Frequencies for Perceived Stress.

| Item | Never %(n) | Almost Never %(n) | Sometimes %(n) | Fairly Often %(n) | Often %(n) |
|---|---|---|---|---|---|
| Felt unable to control important things | 17.2% (15) | 28.7% (25) | 37.9% (33) | 8.0% (7) | 8.0% (7) |
| Felt nervous and stressed | 3.4% (3) | 14.9% (13) | 35.6% (31) | 26.4% (26) | 19.5% (17) |
| Dealt with irritating life hassles | 0.0 | 1.1% (1) | 31.0% (27) | 42.55 (37) | 25.3% (22) |
| Felt you were coping effectively with changes | 2.3% (2) | 2.3% (2) | 23.3% (20) | 43.0% (37) | 29.0 (25) |
| Felt confident to handle problems | 2.3% (2) | 1.1% (1) | 13.8% (12) | 39.1% (34) | 43.70% (38) |
| Felt things were going your way | 4.6% (4) | 4.6% (4) | 43.7% (38) | 25.3% (22) | 21.8% (19) |
| Could not cope with all you had to do | 14.9% (13) | 26.4% (23) | 34.5% (30) | 12.6% (11) | 11.5% (10) |
| Able to control irritations | 1.1% (1) | 3.4% (3) | 35.6% (31) | 39.1% (34) | 20.7% (18) |
| Felt on top of things | 4.6% (4) | 5.7% (5) | 39.1% (34) | 37.9% (33) | 12.6% (11) |
| Angered at things outside your control | 3.4% (3) | 14.9% (13) | 35.6% (31) | 26.4% (23) | 19.5% (17) |
| Thinking about things you have to do | 0.0 | 1.1% (1) | 8.0% (7) | 24.1% (21) | 66.7% (58) |
| Able to control your time | 2.3% (2) | 13.8% (12) | 31.0% (27) | 25.3% (22) | 27.6% (24) |
| Felt difficulties piling up so high you couldn't overcome them | 18.4% (16) | 36.8% (32) | 29.9% (n) | 1.1% (1) | 13.8% (12) |

**Table 10.** Response Frequencies for Depression Items at Time Two.

| Item | Not often %(n) | Somewhat often %(n) | Very often %(n) |
|---|---|---|---|
| Lack of enthusiasm for doing anything | 59 (51) | 35 (30) | 7 (6) |
| Have a poor appetite | 78 (68) | 16 (14) | 6 (5) |
| Feel lonely | 87 (76) | 10 (9) | 2 (2) |
| Loss of sexual interest | 83 (71) | 16 (14) | 1 (1) |
| Trouble sleeping | 45 (39) | 37 (32) | 18 (16) |
| Cry easily or felt life crying | 68 (59) | 28 (24) | 5 (4) |
| Feel down hearted and blue | 63 (55) | 31 (27) | 6 (5) |
| Feel low in energy | 36 (32) | 51 (45) | 11 (10) |
| Feel hopeless about future | 70 (61) | 22 (19) | 8 (7) |

**Table 11**. Response Frequencies for Anxiety Items (HOS).

| Item | Never %(n) | Seldom %(n) | Often %(n) | Frequently %(n) |
|---|---|---|---|---|
| Bothered by an upset stomach | 26 (23) | 46 (40) | 17 (15) | 10 (9) |
| Bothered by nightmares | 63 (55) | 26 (23) | 6 (5) | 5 (4) |
| Troubled by cold sweats | 73 (63) | 16 (14) | 7 (6) | 4 (3) |
| Feel that you are bothered by all sorts of ailments in different parts of your body | 42 (36) | 29 (25) | 20 (17) | 9 (8) |
| Bothered by shortness of breath when not exercising yourself | 61 (52) | 26 (22) | 7 (6) | 7 (6) |
| Feel dizzy or lightheaded | 48 (42) | 36 (31) | 12 (10) | 5 (4) |
| Bothered by your heart beating hard | 60 (50) | 32 (27) | 5 (4) | 4 (3) |
| Ill health affects the amount of work or housework you do | 49 (43) | 24 (21) | 14 (12) | 13 (11) |

**Table 12.** Response frequencies for Anger Items at Time Two (STAXI, T-Anger).

| Item | Almost Never %(n) | Sometimes %(n) | Often %(n) | Almost Always %(n) |
|---|---|---|---|---|
| I am quick tempered | 28 (24) | 58 (49) | 9 (8) | 5 (4) |
| I have a fiery temper | 57 (48) | 35 (30) | 7 (6 ) | 1 (1) |
| I am a hotheaded person | 72 (61) | 9 (22) | 0 (0 ) | 2 (2) |
| It makes me furious when I am criticized in front of others | 32 (27) | 48 (41) 1 | 3 (11) | 7 (6) |
| When I get frustrated, I feel like hitting someone | 80 (68) | 17 (14) | 1 (1) | 2 (2) |
| I feel infuriated when I do a good job and get a poor evaluation | 45 (38) | 42 (36) | 9 (8) | 4 (3) |
| There are people who have pushed me so far that we came to blows | 78 (67) | 17 (14) | 5 (4) | 0 (0) |
| I can think of no good reason for ever hitting a person | 32 (27) | 26 (22) | 5 (4) | 38 (32) |
| I get angry when I am slowed down by other's mistakes | 29 (25) | 59 (50) | 7 (6) | 5 (4) |
| I feel annoyed when I am not given recognition for doing good work. | 41 (35) | 54 (46) | 4 (4) | 0 (0) |
| I fly off the handle | 66 (56) | 3 (2) | 4 (3) | 0 (0) |

**Table 13.** Response Frequencies Indicating Changes in Drinking Patterns over the Past Three Years.

| Item | Don't Drink %(n) | Drink the same %(n) | Drink more %(n) | Drink less %(n) | Quit drinking %(n) |
|---|---|---|---|---|---|
| Has your drinking changed over the past three years | 47%(4) | 33%(29) | 7%(6) | 9%(8) | 3%(2) |
| Has your spouse's drinking changed over the past three years | 48%(42) | 34%(30) | 6%(5) | 10%(9) | 1%(1) |

**Table 14.** Response Frequencies for Family Stressors at Time One and Time Two.

| Item | Time One | | Time Two | |
|---|---|---|---|---|
| | No %(n) | Yes %(n) | No %(n) | Yes %(n) |
| During past year a family member..... | | | | |
| Gave birth or adopted | 86.2 (75) | 13.8 (12) | 92.0 (80) | 8.0 (7) |
| Stopped or quit work | 64.8 (57) | 35.2 (31) | 73.6 (64) | 26.4 (23) |
| Started or returned to work | 85.1 (74) | 14.9 (13) | 54.0 (47) | 46.0 (40) |
| Became ill or injured* | 59.1 (52) | 40.9 (36) | 47.1 (41) | 52.9 (46) |
| Died* | 46.6 (41) | 53.4 (47) | 51.7 (45) | 48.3 (42) |

*Refers to family member, close friend, or relative

**Table 15.** Changes in Family Stressors.

| Item | Mean | t-Value | 2-Tailed probability |
|---|---|---|---|
| During past year a family member.... | | | |
| Gave birth or adopted | Time 1 .14<br>Time 2 .08 | 1.52 | Not significant |
| Stopped or quit work | Time 1 .34<br>Time 2 .26 | 1.19 | Not significant |
| Started or returned to work | Time 1 .15<br>Time 2 .46 | -4.57 | .000 |
| Became ill or injured* | Time 1 .40<br>Time 2 .53 | -1.83 | Not significant |
| Died* | Time 1 .54<br>Time 2 .48 | .78 | Not significant |

*Refers to family member, close friend, or relative

**Table 16.** Response Frequencies for Family Strains at Time One and Time Two.

| Item | Time One | | Time Two | |
|---|---|---|---|---|
| | No | Yes | No | Yes |
| | % (n) | % (n) | % (n) | % (n) |
| During the past year there has been an increase in. . . | | | | |
| Arguments between parents and children | 60.2 (53) | 39.8 (35) | 65.5 (57) | 34.5 (30) |
| Unresolved problems | 65.9 (58) | 34.1 (30) | 75.9 (66) | 24.1 (21) |
| Tasks that don't get done | 42.0 (37) | 58.0 (51) | 51.7 (45) | 48.3 (42) |
| Strain on family money | 17.0 (15) | 83.0 (73) | 34.1 (30) | 64.8 (57) |

**Table 17.** Changes in Family Strains at Time One and Time Two.

| Item | Mean | t-value | 2-tailed probability |
|---|---|---|---|
| During the past year there has been an increase in... | | | |
| Arguments between parents and children | Time 1 .39<br>Time 2 .34 | .71 | Not significant |
| Unresolved problems | Time 1 .47<br>Time 2 .43 | 1.47 | Not significant |
| Tasks that don't get done | Time 1 .59<br>Time 2 .48 | 1.49 | Not significant |
| Strain on family money | Time 1 .83<br>Time 2 . 65 | 2.90 | .005 |

**Table 18.** Response Frequencies Family Distress at Time One and Time Two.

| Item | Time One | | Time Two | |
|---|---|---|---|---|
| | No | Yes | No | Yes |
| | % (n) | % (n) | % (n) | % (n) |
| During the past year, a family member... | | | | |
| Had emotional problems | 75.0 (66) | 25.0 (22) | 55.2 (48) | 44.8 (39) |
| Depended on drugs or alcohol | 89.8 (79) | 10.2 (9) | 85.1 (74) | 14.9 (13) |
| There was physical or psychological violence at home | 90.9 (80) | 9.2 (8) | 93.1 (81) | 6.9 (6) |
| Had increased sexual difficulty | 89.7 (78) | 10.3 (9) | 86.2 (75) | 12.6 (11) |

**Table 19.** Changes in Family Distress.

| Item | Mean | t-Value | 2 Tailed probability |
|---|---|---|---|
| During the past year a family member. . . | | | |
| Had emotional problems | Time 1 .24<br>Time 2 .44 | -3.37 | .001 |
| Depended on alcohol or drugs | Time 1 .09<br>Time 2 .15 | -1.52 | Not significant |
| There was physical or psychological Violence | Time 1 .08<br>Time 2 .07 | .45 | Not significant |
| Had increased sexual difficulty | Time 1 .13<br>Time 2 .13 | .00 | Not significant |

**Table 20.** Response Frequencies for Marital Satisfaction at Time Two.

| Item | Unsatisfied or Extremely Unsatisfied (1-2) % (n) | Somewhat Satisfied (3-5) % (n) | Satisfied or Extremely Satisfied (6-7) % (n) |
|---|---|---|---|
| How satisfied are you with your marriage? | 0% (0) | 18% (16) | 81% (71) |
| How satisfied are you with your relationship with your husband/wife? | 0% (0) | 22% (19) | 77% (68) |
| How satisfied are you with your spouse? | 1% (1) | 19% (12) | 85% (74) |

**Table 21.** Desire for Children *Not* to Go into Commercial Fishing at Time One and Time Two.

| | Time One* | Time Two |
|---|---|---|
| | %(n) | %(n) |
| Husband | 91 (32) | 88 (38) |
| Wife | 82 (27) | 89 (39) |

*9 men and 11 women did not answer the question.

**Table 22.** Perceptions About the Future of Commercial Fishing at Time One and Time Two.

| | Time One | | | | Time Two | | | |
|---|---|---|---|---|---|---|---|---|
| | Good %(n) | Unstable %(n) | Risky %(n) | Hopeless %(n) | Good %(n) | Unstable %(n) | Risky %(n) | Hopeless %(n) |
| Husband | (0) | 29.5(13) | 50(22) | 20.5(9) | 0(0) | 13.6(6) | 34.1(15) | 52.3(23) |
| Wife* | (0) | 27.3(12) | 38.6(17) | 20.5(9) | 0(0) | 15.9(7) | 31.8(14) | 50(22) |

*6 women did not answer Time One and 1 Time Two.

**Table 23.** Zero Order Correlations for All Variables in the Analyses.

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Depression | 1.0 | | | | | | | | | |
| 2. Anxiety | .557* | 1.0 | | | | | | | | |
| 3. Anger | .408* | .315 | 1.0 | | | | | | | |
| 4. Gender | .067 | -.080 | .209 | 1.0 | | | | | | |
| 5. Age | .070 | .074 | .050 | .190 | 1.0 | | | | | |
| 6. Perceived Stress | .656* | .446* | .459* | -.129 | -.041 | 1.0 | | | | |
| 7. Family Stress | .395* | .341* | .329* | -.070 | -.026 | .466* | 1.0 | | | |
| 8. New Job | -265* | .262* | -.238* | -.018 | .054 | -.117 | -.194 | 1.0 | | |
| 9. Self Esteem | -.531* | -.451* | -.318* | -.015 | .023 | -.418* | -.279* | .141 | 1.0 | |
| 10. Mastery | -.544* | -.321 | -.514* | -.032 | .056 | -.629* | -.366* | .242* | .660* | 1.0 |

* $p<.05$

**Table 24.** The Multivariate Models of Stress Outcomes with Sociodemographic, Risk, and Protective Factors.

| | Depression Model | | | Anxiety Model | | | Anger Model | | |
|---|---|---|---|---|---|---|---|---|---|
| Variables | B | *b* | SE of *b* | B | *b* | SE of *b* | B | *b* | SE of *b* |
| Sociodemographic Factors | | | | | | | | | |
| Gender (Male) | .138 | .109 | .063 | -.039 | -.047 | .114 | .281 | .230* | .094 |
| Age | .059 | .002 | .003 | .084 | .005 | .006 | .062 | .003 | .004 |
| Risk Factors | | | | | | | | | |
| Perceived Stress | .517 | .396* | .081 | .338 | .392* | .146 | .293 | .286* | .119 |
| Family Stress | .066 | .105 | .139 | .122 | .293 | .252 | .085 | .170 | .206 |
| Protective Factors | | | | | | | | | |
| New Job | -.159 | -.100* | .051 | -.204 | .196* | .091 | -.125 | -.101 | .075 |
| Self-Esteem | -.303 | -.275* | .092 | -.419 | -.576* | .167 | .010 | .011 | .135 |
| Mastery | .045 | .037 | .100 | .264 | .328 | .182 | -.282 | -.294* | .148 |
| Constant | | .963* | .439 | | 1.387* | .695 | | 1.316* | .645 |
| Adjusted $R^2$ | .51* | | | .29* | | | .34* | | |

*$p<.05$

**Table 25.** The Multivariate Model of Perceived Stress with Sociodemographic, Risk, and Protective Factors.

| | Perceived Stress Model | | |
|---|---|---|---|
| Variables | B | *b* | SE of *b* |
| Sociodemographic Factors | | | |
| Gender | -.112 | -.116 | .087 |
| Age | -.010 | .000 | .004 |
| Risk Factors | | | |
| Family Stress | .274 | .566* | .184 |
| Coping Resources | | | |
| New Job | .079 | .065 | .070 |
| Self Esteem | .029 | .034 | .128 |
| Mastery | -.567 | -.610* | .122 |
| Constant | | 4.201* | .388 |
| Adjusted $R^2$ | .44 | | |

*$p<.05$

**Table 26.** Differences between Men and Women on Stress.

| Variable | Group | Mean | T Value | 2-Tail Probability |
|---|---|---|---|---|
| Depression Index | Women | 1.45 | -.62 | Not Significant |
| | Men | 1.66 | | |
| Anxiety Index | Women | 1.74 | .79 | Not Significant |
| | Men | 1.64 | | |
| Anger Index | Women | 1.45 | -1.97 | .05 |
| | Men | 1.65 | | |
| Age | Women | 36.2 | -1.16 | Not Significant |
| | Men | 39.0 | | |
| Perceived Stress Index | Women | 2.78 | 1.21 | Not Significant |
| | Men | 2.64 | | |
| Family Stress Index | Women | .215 | .64 | Not Significant |
| | Men | .180 | | |
| New Job(s) as a Result of Net Ban | Women | .48 | .70 | Not Significant |
| | Men | .45 | | |
| Self Esteem Index | Women | 3.19 | .13 | Not Significant |
| | Men | 3.17 | | |
| Mastery Index | Women | 2.75 | .30 | Not Significant |
| | Men | 2.72 | | |

**Table 27.** Coping Resources at Time One and Time Two.

| Variable | Group | Mean | T Value | 2-Tail Probability |
|---|---|---|---|---|
| Social Support Index | Time Two | 3.61 | 3.40 | .001 |
| | Time One | 3.32 | | |
| Social Coping Index | Time Two | 3.17 | .84 | Not Significant |
| | Time One | 3.09 | | |
| Family Hardiness Index | Time Two | 1.98 | 8.46 | .000 |
| | Time One | 1.57 | | |
| Mastery Index | Time Two | 2.74 | 3.24 | .002 |
| | Time One | 2.57 | | |
| Self Esteem Index | Time Two | 3.18 | .42 | Not Significant |
| | Time One | 3.16 | | |
| Perceived Stress Index | Time Two | 2.70 | -12.83 | .000 |
| | Time One | 3.50 | | |
| Depression Index | Time Two | 1.40 | -1.94 | Not Significant |
| | Time One | 1.50 | | |
| Family Stress Index | Time Two | .20 | 2.13 | .036 |
| | Time One | .14 | | |

**Table 28.** Household Participation in Assistance Programs Since the Net Ban (n = 44).

| Type of assistance | % | Number |
|---|---|---|
| Net buy-back program | 82 | 36 |
| Obtain information from CES | 64 | 28 |
| Unemployment benefits | 59 | 26 |
| Aquaculture training or demonstrations | 16 | 7 |
| Job training | 16 | 7 |
| Direct assistance (e.g. food stamps) | 16 | 7 |

## APPENDIX

### Measures of Stress Outcomes

#### *Perceived Stress*

The perceived stress index consisted of 13 variables such as feeling unable to control important things, nervous and stressed, things are going their way, unable to cope, on top of things, angered, and that difficulties were piling up. Participants were given the response categories (1) never, (2) almost never, (3) sometimes, (4) fairly often, and (5) often and respondents were asked how often in the last week they had experienced these feelings (See Table 9).

Factor analysis produced a single factor with an Eigenvalue of 3.31, which explained 47 percent of the variation within the model. Alpha reliability for this index was .81. Each respondent's individual perceived stress index score was figured as the mean of the responses to the seven questions. Then the mean of all the respondents' perceived stress index scores was taken. The mean of all the respondents' scores was 2.7 and the standard deviation was .52.

#### *Depression*

Participants were presented with 9 items that are considered standard indicators of depression: lack of enthusiasm, poor appetite, loneliness, loss of sexual interest, trouble sleeping, feeling low in energy, crying, feeling blue, and feeling hopeless about the future. Then they were asked to indicate how often during the past week they had experienced these feelings: (1) never, (2) somewhat often, and (3) very often (See Table 10).

Factor analysis produced a single factor with an Eigenvalue of 3.28, which explained 47 percent of the variation within the model. Alpha reliability for this index was .81. Each participant's individual depression index score was figured as the mean of the responses to the seven questions. Then the mean of all the participants' depression index scores was calculated. The mean of all the respondents' scores was 1.4 and the standard deviation was .41.

#### *Anxiety*

The anxiety index consisted of the following 8 items: bothered by an upset stomach, bothered by nightmares, troubled by cold sweats, bothered by all sorts of ailments, bothered by shortness of breath, bothered by heart beating hard, feeling dizzy or lightheaded, and ill health affected activities. Participants were asked to indicate how often during the past week they had these feelings: (1) never, (2) seldom, (3) often, and (4) frequently (see Table 11).

Factor analysis produced a single factor with an Eigenvalue of 3.71, which explained 53 percent of the variation within the model. Alpha reliability for this index was .84. Each participants individual anxiety index score was figured as the mean of the responses to the seven

questions. Then the mean of all the participants' anxiety index scores was calculated. The mean of all the respondents' scores for the anxiety index was 1.7 and the standard deviation was .61.

### *Anger*

The anger index consisted of 11 variables referring to temper, feeling of, anger at others, saying nasty things, and feel liking hitting someone. Participants were asked to indicate how often they had these feelings: (1) almost never, (2) sometimes, (3) often, and (4) almost always (See Table 12).

Factor analysis produced a single factor with an Eigenvalue of 3.94, which explained 56 percent of the variation within the model. Alpha reliability for this index was .87. Each respondent's individual anger index score was figured as the mean of the responses to the seven questions. Then the mean of all the respondents' anger index scores was taken. The mean of all the respondents' scores was 1.6 and the standard deviation was .50.

### *Family Stress*

The family stress index consisted of four variables. Respondents were asked whether in the past year: a family member had emotional problems, a family member had a dependency on alcohol, the family experienced physical or psychological violence, and the couple had difficult sex relations. Responses were coded as 0 ' no and 1 ' yes.

Factor analysis produced a single factor with an Eigenvalue of 1.85, which explained 46 percent of the variation within the model. Alpha reliability for this index was .61. Each respondent's individual family stress index score was figured as the mean of the responses to the four questions. Then the mean of all the respondents' family stress index scores was taken. The mean of all the respondents' scores was .19 and the standard deviation was .25.

### *Industry Change*

The industry change index consisted of four questions that assessed the degree of change in the fishing industry. These questions asked about the change in (1) pounds of all species landed, (2) total income from fishing, (3) regions where you fish, and (4) total time fishing each year. Response categories were as follows: 1=major decrease, 2=some decrease, 3=no change, 4=some increase, and, 5=major increase.

Factor analysis produced a single factor with an Eigenvalue of 1.97, which explained 49 percent of the variation within the model. Alpha reliability for this index was .75. Each respondent's industry change index score was figured as the mean of the responses to the four questions. Then the mean of all the respondents' industry change index scores was taken. The mean of all the respondents' scores was 2.05 and the standard deviation was .86.

### *Self Esteem*

The self esteem index consisted of eight variables. Participants were asked to indicate how strongly they agreed or disagreed with the following statements: (1) I feel have a number of good qualities, (2) I am not proud of much, (3) I take a positive attitude, (4) I am satisfied with myself, (5) I feel that I am a failure, (6) I wish I had more self respect, (7) I feel useless at times, and (8) I think I am no good at all. Participants rated their level of agreement on a four point scale: (1) strongly agree, (2) agree, (3) disagree, and (4) strongly disagree.

Factor analysis produced a single factor with an Eigenvalue of 4.48, which explained 56 percent of the variation within the model. Alpha reliability for this index was .89. Each respondent's individual self-esteem index score was figured as the mean of the responses to the eight questions. Then the mean of all the respondents' self-esteem index scores was taken. The mean of all the respondents' scores was 3.2 and the standard deviation was .43.

### *Mastery*

The mastery index consisted of seven variables. Participants were asked to indicate how strongly they agree or disagree with the following statements: (1) there is no way I can solve some of the problems I have, (2) sometimes I feel that I am being pushed around in life, (3) I have little control, (4) I can do just about anything, (5) I often feel helpless, (6) what happens in the future is up to me, and (7) there is little I can do to change the important things in my life. Participants were given four response categories: (1) strongly agree, (2) agree, (3) disagree, and (4) strongly disagree.

Factor analysis produced a single factor with an Eigenvalue of 3.13, which explained 52 percent of the variation within the model. Alpha reliability for this index was .82. Each respondent's individual mastery index score was figured as the mean of the responses to the seven questions. Then the mean of all the respondents' mastery index scores was taken. The mean of all the respondents' scores was 2.7 and the standard deviation was .48.

### *New Job*

Husbands and wives were asked if they had any employment other than fishing and for how long they have held those jobs. Respondents were also asked if these jobs were a result of the net ban. The new job variable was calculated by creating a zero - one indicator variable. If respondents had indicated they had at least one job, for less than three years, and, indicated the new job was a result of the net ban, the respondent was assigned a score of one. One third of all respondents (29) indicated they held other jobs as a result of the net ban.