

The 1994 Florida Recreational Spiny Lobster Fishing Season: Results of a Mail Survey

**WILLIAM C. SHARP, RODNEY D. BERTELSEN,
and JOHN H. HUNT**

*Florida Department of Environmental Protection
Florida Marine Research Institute
South Florida Regional Laboratory
2796 Overseas Highway, Suite 119
Marathon, Florida 33050*

ABSTRACT

Since 1991, the Florida Department of Environmental Protection has conducted annual mail surveys of recreational spiny lobster fishers in Florida. These surveys concern lobster-fishing activity during the periods of the Special Two-Day Sport Season and the first month of the regular season and allow us to estimate the recreational harvest, the number of people that fished, fishing group size, and CPUE for those times.

We estimate that 51,510 fishers landed 362,369 lobsters during the 1994 Special Two-Day Sport Season and that 63,225 fishers landed 1,320,045 lobsters during the first month of the 1994 regular season. Most (64%) of the total number of lobsters captured during these two survey periods were harvested in the Florida Keys, and those fishing in the Florida Keys had the highest mean CPUE. Most of the remaining lobsters were harvested along the southeast coast of Florida (Dade and Broward counties). Comparisons with previous surveys indicate that the recreational harvest is stable and composes approximately 20% of the total Florida lobster harvest.

KEYWORDS: mail survey; spiny lobster; recreational fishers.

INTRODUCTION

The Caribbean spiny lobster, *Panulirus argus* (Latreille), is one of the most intensely exploited shellfish throughout its range. In Florida, the spiny lobster supports an extensive commercial fishery with annual landings of approximately 13 million kgs and is second only to pink shrimp in economic value (Harper, 1995). Approximately 90% of the annual spiny lobster harvest is landed in the Florida Keys; most of the remaining landings occur along the southeast coast of the state (Florida Department of Environmental Protection, Marine Fisheries Information System). In addition to its commercial fishery, the spiny lobster supports a widely popular recreational sport-dive industry. Zuboy (1980), using

the Delphi method (Linstone and Turoff, 1975), estimated that the recreational harvest constituted approximately 10% of the total Florida spiny lobster harvest. However, more recent surveys conducted by the Florida Department of Environmental Protection (FDEP) indicated that the recreational harvest constituted approximately 20% of the total harvest (Hunt, 1994).

The recreational lobster fishing season in Florida is divided into two parts. The first part is the Special Two-Day Sport Season that occurs on the last Wednesday and Thursday in July. The second part is the regular season that coincides with the commercial fishing season (August 6 through March 31). Since 1991, the FDEP has conducted annual mail surveys of recreational lobster fishers to gain information about lobster-fishing activity during the Special Two-Day Sport Season and the first month of the regular season. These surveys have provided a direct estimate of recreational lobster harvest, level of fisher participation, and CPUE. Additionally, these surveys facilitate the analysis of long-term trends and the assessment of management regulations implemented within the fishery. In this paper, we present the results of our 1994 mail survey and discuss trends in the fishery resulting from recent rule changes governing the Special Two-Day Sport Season. We also present and discuss recent trends in landings allocation between the recreational and commercial sectors resulting from recently instituted management strategies within the commercial fishery.

MATERIALS AND METHODS

Mail Survey

Recreational fishers are required to purchase a Florida Crawfish Stamp to harvest spiny lobster in Florida waters. This stamp is an endorsement to the Florida Recreational Saltwater Fishing License and permits fishers to harvest 12 lobsters per day during the Special Two-Day Sport Season (6 lobsters per day in Monroe County) and 6 lobsters per day or 24 lobsters per day per boat, whichever is greater, during the regular season (Florida Administrative Code, 1992). Stamp sales have averaged approximately 110,000 annually.

One in ten lobster stamp purchasers was asked to fill out an FDEP survey card with their name, address, county of residence, and phone number. These cards were sent from the place of purchase (county tax collector or authorized dealer such as a tackle or dive shop) to the FDEP. After discarding incomplete entries, we randomly selected 2,000 names to receive a Special Two-Day Sport Season questionnaire (Appendix A). To ensure equal representation of mail survey responses from license holders residing throughout Florida and those residing outside the state, these selections were stratified into 10 residence areas based on zip code (Figure 1). An additional 2,000 names were selected by the same protocol to receive a questionnaire about lobster fishing during the first month of the regular season (Appendix B).

The general methodology of our mail survey followed the "Total Design Method" (Dillman, 1978). The Special Two-Day Sport Season questionnaires were mailed one week after the end of that season, and the regular season questionnaires were mailed on September 12, one week after Labor Day (the first Monday in September; September 5, 1995). A personally addressed, signed cover letter and a business reply envelope accompanied each questionnaire. One week following the initial mailings, each addressee was mailed a "thank you/reminder" postcard. Addressees that did not return a questionnaire within seven weeks of the initial mailout received an additional reminder letter and a replacement questionnaire.

Harvest Estimation

We used a Monte Carlo method (sampled randomization) to calculate harvest and fisher participation (Sokal and Rohlf, 1981). This method entailed generating a database composed of a random sample of completed questionnaires. To generate this random database, questionnaires were first entered into an electronic database. From this database, questionnaires were selected randomly from the pool of questionnaires, read into a new database, and then placed back into the questionnaire pool. This process was repeated a number of times equal to the total number of questionnaires received. Once this database was assembled, the following parameters were calculated: 1) the percentage of license holders that fished, 2) the number of groups that fished, 3) the average number of days those groups fished, and 4) the average number of lobsters caught per fishing group. These parameters were calculated for each of seven fishing zones (Figure 2) so that we could examine regional differences in harvest, participation, and CPUE. The harvest was equal to the number of groups multiplied by the average number of days fished multiplied by the average number of lobsters caught per group. This was calculated for each fishing region and summed for a statewide harvest. A thousand iterations of the Monte Carlo were performed for each survey and the harvest and participation estimates presented are the mean values of those thousand iterations. The following describes the calculations used to estimate harvest for one randomized iteration.

1) We estimated the number of license holders that fished in each fishing zone. This was equal to the number of lobster stamp sales for up to one year before the survey, multiplied by the percentage of survey respondents that fished, then multiplied by the percentage that fished in a given fishing region.

$$LF_j = \left(\sum LF * \frac{\sum \text{yes}}{\sum \text{yes} + \sum \text{no}} \right)$$

Where:

LF=licensed fishers with lobster stamps

$\sum LF$ = the sum of lobster stamps sold up to 1 year prior to the survey

Yes = survey respondents that said they fished for lobster during the survey period

No = Survey respondents that said they did not fish for lobster

j = jth fishing zone

2) We then determined the number of groups in each fishing zone. Because fishers younger than 16 and over 65 years of age are not required to purchase a license, and because our estimate of the total number of potential fishers was based on license sales, we used the average licensed group size for this estimate. Therefore, we first subtracted the average number of non-licensed fishers from the average fishing group size. The number of groups fishing in each fishing zone was equal to the number that fished in a given zone (LF_j) divided by the average licensed group size.

$$NG_j = LF_j / \left(\frac{\sum \text{grpsize}_j}{n_j} \right) - \left(\frac{\sum \text{nosize}_j}{n_j} \right)$$

Where:

NG = number of fishing groups

grpsize = group size (includes licensed and non-licensed fishers)

nosize = number of non-licensed fishers in groups

n = number of observations

3) We then calculated the average number of lobsters caught per fishing group. Respondents reported group catch by checking boxes that show a catch range. The midpoint of this range was used as the class mark. For example, if a respondent checked a box indicating they caught 6-10 lobsters, 8 lobsters was the class mark. The average number of lobsters caught per fishing group was calculated using the frequency of each response and its class mark.

$$GC_j = \frac{\sum f_k c_k}{n_j}$$

Where:

GC = number of lobsters caught per group

f = frequency of a given response

c = class mark for a given response

k = a response class

4) We calculated the average number of days fished for each fishing zone (regular season survey only).

$$D_j = \frac{\sum D_i}{n_j}$$

Where:

D = number of days fished

5) We then calculated landings. This was equal to the group catch, multiplied by the group size, multiplied by the number of groups. This calculation was performed for each fishing zone, and then summed to estimate statewide landings.

$$H_j = GC_j * NG_j * GC_j * \bar{D}_j$$

Where:

H = estimated lobster harvest (numbers of lobster)

6) Steps 1 through 5 were repeated 1,000 times to determine the range of possible harvests.

RESULTS AND DISCUSSION

We received more than 1,100 completed questionnaires from each of the two surveys (Table 1). Approximately 40% of license holders participated in the Special Two-Day Sport Season and 60% participated at some time during the first month of the regular season (Table 2). The percentage of license holders that fished during the Special Two-Day Sport Season was higher among license holders residing in south Florida than in the northern portions of the state; this trend was not evident in the regular season survey.

We estimate that approximately 51,510 (SD \pm 2,098) fishers landed 362,369 (SD \pm 20,241) lobsters during the Special Two-Day Sport Season and that 63,225 (SD \pm 1,723) fishers landed 1,320,045 (SD \pm 87,012) lobsters during the first month of the regular season (Table 3). Most of the lobster fishing effort and harvest in both seasons occurred in the Florida Keys. Most of the remaining effort and harvest occurred in the Dade/Broward fishing zone. Both effort and harvest decreased progressively northward along the east coast of Florida.

The average fishing group-size during both the Special Two-Day Sport Season and the first month of the regular season was approximately 4 people, but group size was larger in the Florida Keys fishing zone than in other fishing zones during the Special Two-Day Sport Season (Table 4). The estimated mean CPUE per fishing group during the Special Two-Day Sport Season was also highest in the Florida Keys (20.6 lobsters per day). Mean CPUE decreased considerably during the regular season in the Florida Keys, but changed little in other fishing zones.

Because our mail surveys only encompass the Special Two-Day Sport Season and the first month of the regular season, we asked respondents to indicate their fishing intentions for the remainder of the season (Figure 3). Although 60% of respondents fished during August, only 40% indicated they planned to fish during September. The percentage of those who intended to fish after September fell progressively each month to 17% by January and February then rose slightly during March. To further evaluate these responses, we conducted an additional mail survey of recreational fishers at the conclusion of the 1994-1995 fishing season concerning their fishing activities from Labor Day to the end of the fishing season. We received 458 responses from an effective mailout (i.e. the number of undeliverable questionnaires subtracted from the total number of questionnaires mailed) of 846 license holders. The results of this survey could provide only a coarse estimate of participation and harvest because i) the number of respondents was relatively small and ii) the results were not calculated with the Monte Carlo; therefore, the precision of our estimates is

unknown. However, this survey did suggest that fishing effort did decline precipitously after Labor Day. We estimate that only 13% of license holders fished for lobster after September and that only 156,500 additional lobsters were harvested after Labor Day.

The 1994 mail survey was the fourth survey we have conducted of the recreational fishery. Comparison of the results of this survey to those of our earlier surveys reveals that total recreational harvest through Labor Day has remained approximately 1.5 million lobsters, except during the 1992 season (Figure 4). The lower total harvest that season was likely the result of Hurricane Andrew, which effectively ended lobster fishing in south Florida during the last two weeks of August during our regular season survey period.

Prior to the 1992 fishing season, the Florida Marine Fisheries Commission implemented a series of rule changes within the recreational fishery that were designed to reduce the growing numbers of fishers traveling to the Florida Keys during the Special Two-Day Sport Season. These rule changes included rescheduling the Special Two-Day Sport Season from the traditional weekend to midweek, increasing the daily lobster bag limit outside the Florida Keys, and banning night diving in the Florida Keys. Our surveys suggest that this management strategy has been successful. Since 1992, there has been a discernable decline in the percentage of mail survey respondents that fished in the Florida Keys during the Special Two-Day Sport Season and a commensurate increase in the percentage of respondents that fished on the southeast coast of Florida (Figure 5). However, this trend has not resulted in a noticeable shift in lobster harvest; the Florida Keys continue to account for well over half of the total recreational catch (Figure 6). This in part may reflect the availability of lobster in shallow waters along the Florida Keys and the fact that Florida Keys residents, who are typically among the most experienced fishers, continue to fish exclusively in the Florida Keys.

Also in 1992, the State of Florida implemented the Trap Certificate Program (Florida Statutes, 1992). This law required the Florida Marine Fisheries Commission to establish a lobster trap reduction program within the commercial fishery. This program was designed to maintain or maximize sustained harvest from the fishery (Hunt, 1994). Since the inception of this management program, the number of traps in the fishery has been reduced from approximately 939,000 to approximately 600,000. Many in the industry expressed considerable concern that this reduction in effort could potentially result in a shift in the relative harvest allocation between the commercial and recreational fishing sectors toward the recreational fishery. If we first convert our harvest estimates (reported as number of lobsters) into weight estimates, we can compare our results with commercial lobster landings reported by Harper (1995) and examine the harvest allocation between the two sectors of the fishery. This conversion is accomplished by obtaining the average carapace length (CL) of lobsters

harvested commercially for a given year (Florida Marine Research Institute, Fisheries Dependant Monitoring Program, unpublished data), and converting that value to a weight estimate (WT) using the equation, $WT = 0.002185 @ CL^{2.78138}$ (Florida Marine Research Institute, unpublished data), then multiplying that value by our harvest estimate. The comparison indicates that a discernable shift in the harvest allocation between the two sectors has not yet occurred (Figure 7). Since 1991, the relative proportion of the harvest landed by the recreational sector has remained approximately 20% of the total harvest, though overall harvest has fluctuated. We will continue to monitor the relative harvest by these fishing sectors as the trap reduction program continues.

We feel that our mail surveys are an effective method to monitor the recreational fishery and are an invaluable aid in the management of the spiny lobster fishery in Florida. Our survey efforts will continue annually and sections of our questionnaires will remain constant so that we can make direct year-to-year comparisons of harvest and participation. However, other portions of the questionnaire can be modified as needed to reflect proposed or actual management regulations.

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Table 1. Mailout and response rates for the 1994 Special Two-Day Sport Season and the regular season (first month) surveys. Mailout is the number of names and addresses selected for the survey. Effective mailout equals the mailout less the undeliverable questionnaires (e.g., incorrect addresses).

Survey	Mailout	Effective Mailout	Returns
Special Two-Day Season	2,283	1,881	1,184 (63%)
Regular season (first month)	2,295	1,915	1,137 (60%)

Table 2. Percentage of licensed holders that fished during the 1994 Special Two-Day Sport Season and the first month of the regular season.

Residence Area	Special Two-Day Sport Season	Regular season (First Month)
Out of State	12	39
Panhandle	19	54
Northeast Coast	36	62
West Coast	30	57
Central Inland	39	57
Central East Coast	39	67
Palm Beach County	49	65
Broward County	52	69
Dade County	54	58
Florida Keys	48	60
Overall	41	59

Fishing Zone	Special Two-Day Sport Season				Regular season (First Month)							
	Harvest	±SD	% of Total	Participation	±SD	% of Total	Harvest	±SD	% of Total	Participation	±SD	% of Total
Panhandle	*	*	(<1)	*	*	(<1)	*	*	(2)	*	*	(1)
West Coast	*	*	(<1)	*	*	(<1)	*	*	(1)	*	*	(2)
Florida Keys	218,878	±16,631	(60)	25,914	±1,751	(51)	855,430	±67,614	(65)	50,659	±2,264	(57)
Dade/Broward	100,712	±12,661	(28)	15,099	±1,381	(29)	216,722	±30,739	(16)	18,246	±1,557	(21)
Palm Beach/Martin	16,243	±3,963	(4)	5,117	±838	(10)	92,412	±23,602	(7)	8,549	±1,049	(10)
Central East Coast	21,079	±5,324	(6)	4,228	±725	(8)	113,086	±26,125	(9)	7,535	±1,005	(9)
Northeast Coast	*	*	(1)	*	*	(1)	*	*	(1)	*	*	(1)
Statewide Totals	362,369	±20,241		51,510	±2,098		1,320,044	±87,612		63,225	±1,723	

* Fewer than 20 responses were received. However, estimates are incorporated into statewide totals.

† Survey respondents that fished in more than one fishing zone are counted in each of the zones in which they fished. Therefore, the sum of the estimated number of participants in each fishing zone does not equal the estimate of total statewide participation.

Table 3. The estimated lobster harvest and participation for the 1994 Special Two-Day Sport Season and the first month of the regularseason by fishing zone.

Fishing Zone	Special Two-Day Sport Season			Regular Season (First Month)			
	Fishing-Group Size	±SD	CPUE	±SD	Fishing-Group Size	CPUE	±SD
Panhandle	*	*	*	*	*	*	*
West Coast	*	*	*	*	*	*	*
Florida Keys	4.7	±.14	20.6	±1.14	4.3	14.2	±.57
Deale/Broward	3.8	±.16	14.1	±1.45	3.6	11.3	±.82
Palm Beach/Martin	3.7	±.21	6.1	±1.10	3.6	9.3	±1.26
Central East Coast	3.4	±.17	8.8	±1.51	3.5	10.6	±1.04
Northeast Coast	*	*	*	*	*	*	*

* Fewer than 20 responses from these fishing regions.

Table 4. The estimated mean fishing-group size and mean CPUE (lobster caught per day) during the 1994 Special Two-Day Sport Season and the first month of the regular season by fishing zone.

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Figure 2. Map of Florida, USA, showing fishing zones used to examine regional differences in lobster harvest and fisher participation.

Figure 3. Anticipated fishing plans, expressed as a percentage of responses, for the remainder of the 1994-1995 fishing season.

Figure 4. Estimated combined harvest of the Special Two-Day Sport Season and the first month of the regular season.

Figure 5. The percentage of the total fishing activity in the Florida Keys, S.E. Florida (Dade/Broward and Palm Beach/Martin fishing zones), and the remainder of the state for the 1991-1994 Special Two-Day Sport Seasons.

Figure 6. Estimated harvest expressed as a percentage of total harvest in the Florida Keys, S.E.

Florida (Dade/Broward and Palm Beach/Martin fishing zones), and the remainder of the state for the 1991-1994 Special Two-Day Sport Seasons.

Figure 7. Total Florida spiny lobster harvest. Commercial harvest from Harper (1995). Recreational harvest is the sum of the harvest estimates for the Special Two-Day Sport Season and the first month of the regular season. Percentages shown are the percentages of total harvest.

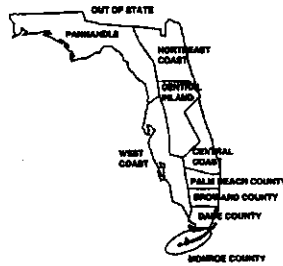


Figure 1. Map of Florida, USA, showing residence areas as defined by zip code. Residence regions were used to stratify the random selections of mail survey recipients.

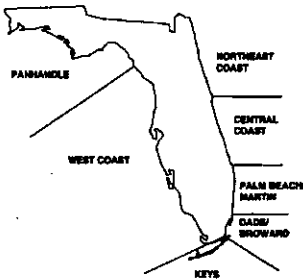


Figure 2. Map of Florida, USA, showing fishing zones used to examine regional differences in lobster harvest and fisher participation.

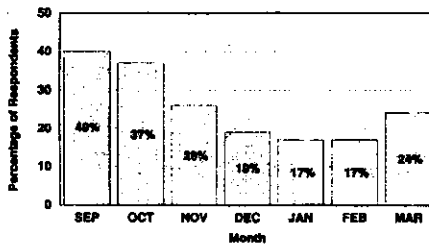


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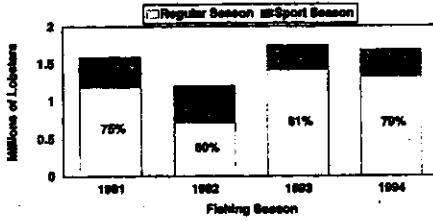


Figure 4. Estimated combined harvest of the Special Two-Day Sport Season and the first month of the regular season.

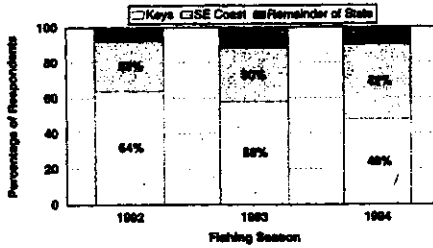


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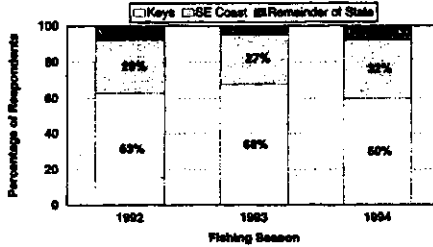


Figure 6. Estimated harvest expressed as a percentage of total harvest in the Florida Keys, S.E. Florida (Dade/Broward and Palm Beach/Martin fishing zones), and the remainder of the state for the 1991-1994 Special Two-Day Sport Seasons.

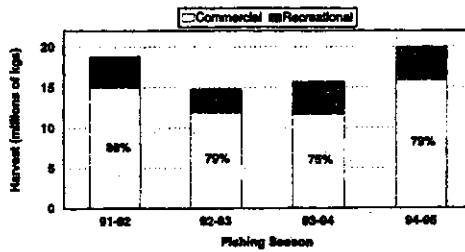


Figure 7. Total Florida spiny lobster harvest. Commercial harvest from Harper (1995). Recreational harvest is the sum of the harvest estimates for the Special Two-Day Sport Season and the first month of the regular season. Percentages shown are the percentages of total harvest.

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Appendix A. Sample 1994 Special Two-Day Sport Season questionnaire.

1994 Special Two-Day Season Survey

Please answer by checking or circling the boxes

1. How many years have you recreationally fished for lobsters?
- (a) I HAVE NEVER FISHED FOR LOBSTERS
 - (b) THIS IS MY FIRST TIME
 - (c) 1-2 YEARS
 - (d) 3-5 YEARS
 - (e) 6-8 YEARS
 - (f) 9-11 YEARS
 - (g) 12-14 YEARS
 - (h) If over 14 years please specify : _____ years

If you have never fished for lobsters, please circle (a) and stop. If you have fished for lobsters, please circle (b) through (g) and stop. If you have fished for lobsters for 12-14 years, please circle (g) and stop. If you have fished for lobsters for more than 14 years, please circle (h) and specify the number of years. Thank you.

2. Did you fish for lobsters during the 1994 Special Two-Day Season?
- (a) NO (If NO, please go to question #15)
 - (b) YES

3. Please circle the number indicating the region(s) where you fished for lobsters during the Special Two-Day Season.

- 1 = Alabama State line to Cedar Key
- 2 = Cedar Key to Cape Hatteras
- 3 = Florida Keys
- 4 = Dade and Broward counties
- 5 = Palm Beach and Martin counties
- 6 = St Lucie county to Cape Canaveral
- 7 = Cape Canaveral to Georgia State line



4. When fishing for lobsters during the Special Two-Day Season, did you generally

- (a) FISH BY YOURSELF
- (b) FISH WITH FAMILY OR FRIENDS
- (c) FISH W/ A GROUP ON A CHARTER BOAT
- (d) OTHER (PLEASE SPECIFY) _____

5. If you fished with family or friends, how many people (include yourself) were in your party (for example, on your boat)?

_____ persons

6. Any person under 16 years of age or any Florida resident aged 65 or over is not required to carry a fishing license or lobster (crawfish) stamp. If you were fishing with family or friends, how many in your party (including yourself) did not need a lobster (crawfish) stamp?

_____ persons

7. How many hours did you spend each day searching and capturing lobsters (include time traveling on boats to and from your fishing area)?

	Wed	Thur
(a) DID NOT FISH THAT DAY	<input type="checkbox"/>	<input type="checkbox"/>
(b) LESS THAN 1 HOUR	<input type="checkbox"/>	<input type="checkbox"/>
(c) 1 TO 2 HOURS	<input type="checkbox"/>	<input type="checkbox"/>
(d) 3 TO 4 HOURS	<input type="checkbox"/>	<input type="checkbox"/>
(e) 5 TO 6 HOURS	<input type="checkbox"/>	<input type="checkbox"/>
(f) 7 TO 8 HOURS	<input type="checkbox"/>	<input type="checkbox"/>
(g) OVER 8 HOURS	<input type="checkbox"/>	<input type="checkbox"/>

8. If you fished in a GROUP, how many lobsters did your group catch and keep each day (include your catch)?

	Wed	Thur
(a) DID NOT FISH THAT DAY	<input type="checkbox"/>	<input type="checkbox"/>
(b) 0 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(c) 1 TO 5 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(d) 6 TO 10 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(e) 11 TO 20 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(f) 21 TO 30 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(g) 31 TO 40 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(h) 41 TO 50 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(i) OVER 50 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>

If over 50 please specify how many _____

9. How many lobsters did you personally catch and keep each day?

	Wed	Thur
(a) DID NOT FISH THAT DAY	<input type="checkbox"/>	<input type="checkbox"/>
(b) 0 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(c) 1 TO 2 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(d) 3 TO 4 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(e) 5 TO 6 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(f) 7 TO 10 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(g) 11 TO 15 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(h) 15 TO 20 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>
(i) OVER 20 LOBSTERS	<input type="checkbox"/>	<input type="checkbox"/>

If over 20 please specify how many _____

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10. Overall, how do you feel about your experiences during the 1994 Special Two-Day Season?

- (a) NO OPINION
- (b) VERY SATISFIED
- (c) SOMEWHAT SATISFIED
- (d) NEITHER SATISFIED OR DISSATISFIED
- (e) SOMEWHAT DISSATISFIED
- (f) VERY DISSATISFIED

11. Did you see the Florida Marine Patrol while fishing for lobsters?

- (a) NO
- (b) YES
- (c) DO NOT RECALL

12. If yes, did the Florida Marine Patrol stop and inspect your catch?

- (a) NO
- (b) YES
- (c) DO NOT RECALL
- (d) NO, BUT I WAS INSPECTED ON LAND

13. Overall, how much money would you estimate you and your party spent for lobster fishing and related activities during the Special Two-Day Season (include gas, food, lodging, rentals, boat costs, sundries, and other costs).

- (a) 0 DOLLARS
- (b) 1 TO 100 DOLLARS
- (c) 101 TO 250 DOLLARS
- (d) 251 TO 500 DOLLARS
- (e) 501 TO 750 DOLLARS
- (f) 751 TO 1000 DOLLARS
- (g) OVER 1000 DOLLARS
(please specify) _____

14. Including yourself, how many people are covered by the expenses you indicated above? _____ persons

*Continued from a NO answer to question 10
General lobster fishing practices*

15. Below are various methods used to capture lobsters. Please indicate any methods used and approximately how often you use a method. Always means you use the method every time or nearly every time. Often means you use the method most of the time or about 3 out of every 4 trips. Sometimes means you use the method about half the time. Rarely means you use the method once in a while or about 1 out of 4 trips.

	Always	Often	Sometimes	Rarely	Never
DIVING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SNORKELING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TICKLE STICK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SNARE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HAND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BULLY NET	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: A bully net is used at night from the surface.

16. Below is a map of Florida with the coastline divided into different regions. Please circle the numbers of ALL areas that you have ever fished for lobsters during any Special Two-Day Season or Regular Season.



17. Below is a map of Florida with the coastline divided into different regions. Please circle a single number indicating where you MOST OFTEN fish for lobsters.



18. Which of the following months do you anticipate you will fish for lobsters for the rest of this season?

- I DON'T PLAN TO FISH
- AUGUST 94
- SEPTEMBER 94
- OCTOBER 94
- NOVEMBER 94
- DECEMBER 94
- JANUARY 95
- FEBRUARY 95
- MARCH 95

19. We use zip codes to geographically determine where responses are coming from. Please enter your current zip code here.

Your comments are welcome and thank you for completing this questionnaire.

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Appendix B. Sample 1994 regular season (opening day to Labor Day) questionnaire.

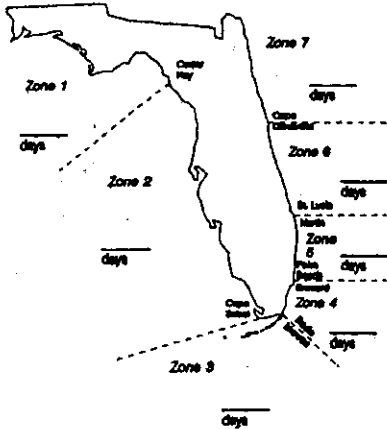
1994 Opening Day to Labor Day Survey

Please answer by checking or circling the boxes

1. How many years have you recreationally fished for lobsters?
- a) I HAVE NEVER FISHED FOR LOBSTERS
 - b) THIS IS MY FIRST TIME
 - c) 1-2 YEARS
 - d) 3-5 YEARS
 - e) 6-8 YEARS
 - f) 9-11 YEARS
 - g) 12-14 YEARS
 - h) If over 14 years please specify: _____ years

If you marked as I have never fished for lobsters, have you bought a lobster (crawfish) stamp? If so, please indicate the number of stamps with # 20. If NO please mark the stamp number anyway. Sending this stamp will help us determine how many stamps are being used.

2. Did you fish for lobsters between Aug 6 and Sep 5?
- a) NO (If NO please skip to question 16)
 - b) YES
3. On what day did you begin fishing during the Regular Season?
- _____ (between Aug 6 and Sep 5)
4. For Aug 6 to Sep 5, please indicate the number of days you fished for lobsters in each region below. Leave blank, those areas you did not fish.



5. When fishing for lobsters between Aug 6 and Sep 5, did you generally
- a) FISH BY YOURSELF
 - b) FISH WITH FAMILY OR FRIENDS
 - c) FISH W/ A GROUP ON A CHARTER BOAT
 - d) OTHER (PLEASE SPECIFY) _____
6. On average, if you fished with family or friends, how many people (include yourself) were in your party (for example, on your boat)?
- _____ persons
7. Any person under 16 years of age or any Florida resident aged 65 or over is not required to carry a fishing license or lobster (crawfish) stamp. If you were fishing with family or friends, how many in your party (including yourself) did not need a lobster (crawfish) stamp?
- _____ persons
8. During a typical day of fishing, how many hours did you spend each day searching and capturing lobsters (include time traveling on boats to and from your fishing area)?
- a) LESS THAN 1
 - b) 1 TO 2 HOURS
 - c) 3 TO 4 HOURS
 - d) 5 TO 6 HOURS
 - e) 7 TO 8 HOURS
 - f) OVER 8 HOURS
9. If you fished in a GROUP, how many lobsters did your group catch and keep per day (include your catch)?
- a) I DID NOT FISH WITH A GROUP
 - b) 0 LOBSTERS PER DAY
 - c) 1 TO 5 LOBSTERS PER DAY
 - d) 6 TO 10 LOBSTERS PER DAY
 - e) 11 TO 20 LOBSTERS PER DAY
 - f) 21 TO 30 LOBSTERS PER DAY
 - g) 31 TO 40 LOBSTERS PER DAY
 - h) 41 TO 50 LOBSTERS PER DAY
 - i) OVER 50 LOBSTERS PER DAY

If over 50 please specify how many _____

(continued on back)

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10. How many lobsters did you personally catch and keep each day?

- 0 LOBSTERS PER DAY
- 1 TO 2 LOBSTERS PER DAY
- 3 TO 4 LOBSTERS PER DAY
- 5 TO 6 LOBSTERS PER DAY
- 7 TO 10 LOBSTERS PER DAY
- 11 TO 15 LOBSTERS PER DAY
- 15 TO 20 LOBSTERS PER DAY
- OVER 20 LOBSTERS PER DAY

If over 20 please specify how many _____

11. Overall, how do you feel about your experiences during the 1994 Regular Season?

- NO OPINION
- VERY SATISFIED
- SOMEWHAT SATISFIED
- NEITHER SATISFIED OR DISSATISFIED
- SOMEWHAT DISSATISFIED
- VERY DISSATISFIED

12. Did you see the Florida Marine Patrol while fishing for lobsters?

- NO
- YES
- DO NOT RECALL

13. If yes, did the Florida Marine Patrol stop and inspect your catch?

- NO
- YES
- DO NOT RECALL
- NO, BUT I WAS INSPECTED ON LAND

14. Overall, how much money would you estimate you and your party spent for lobster fishing and related activities during the first month of the Regular Season (include gas, food, lodging, rentals, boat costs, sundries, and other costs).

- 0 DOLLARS
- 1 TO 100 DOLLARS
- 101 TO 250 DOLLARS
- 251 TO 500 DOLLARS
- 501 TO 750 DOLLARS
- 751 TO 1000 DOLLARS
- OVER 1000 DOLLARS
(please specify) _____

15. Including yourself, how many people are covered by the expenses you indicated above? _____ persons

16. Below are various methods used to capture lobsters. Please indicate any methods used and approximately how often you use a method. Always means you use the method every time or nearly every time. Often means you use the method most of the time or about 3 out of every 4 trips. Sometimes means you use the method about half the time. Rarely means you use the method once in a while or about 1 out of 4 trips.

	Always	Often	Sometimes	Rarely	Never
DIVING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SHOVELING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TICKLE STICK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SNARE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HAND	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BULLY NET	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: A bully net is used at night from the surface.

17. To the right is a map of Florida with the coastline divided into different regions. Please circle the numbers of ALL areas that you have ever fished for lobsters during any Special Two-Day Season or Regular Season.



18. To the right is a map of Florida with the coastline divided into different regions. Please circle a single number indicating where you MOST OFTEN fish for lobsters.



19. Did you fish during the 1994 Special Two-day Season?

- NO
- YES

20. Which of the following months do you anticipate you will fish for lobsters for the rest of this season?

- I DON'T PLAN TO FISH
- DECEMBER 94
- SEPTEMBER 94
- JANUARY 95
- OCTOBER 94
- FEBRUARY 95
- NOVEMBER 94
- MARCH 95

21. We use zip codes to geographically determine where responses are coming from. Please enter your current zip code here.

Your comments are welcome and thank you for completing this questionnaire.