

The 1998 Florida Special Two-day Sport Spiny Lobster Season: Results of a Mail Survey

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ABSTRACT

A special two-day spiny lobster season for recreational fishers only is held in Florida before the start of the regular commercial and recreational season. This special season has generated much discussion and controversy, as well as many defenders and opponents, especially in the Florida Keys. A mail survey was conducted after the 1998 special sport two-day sport season so that we could determine the level of the spiny lobster harvest, level of participation by fishers, the patterns of travel of the fishers, and any patterns in the survey answers as they relate to the fisher's home residence. The two-day statewide harvest totaled more than 314,000 lobsters. Approximately 39,000 fishers were on the water each day. Two-thirds of the harvest and fishing effort occurred in the Florida Keys. We estimate that those who traveled to the Keys spent approximately \$2.3 million during their travels and stay in the Keys and trailered in 2,500 boats. Regarding fishery issues, those living in Monroe, Dade, and Broward counties where most of the fishing occurs, strongly oppose a weekend two-day sport season, whereas those who travel to these areas favor a weekend two-day sport season. Those who hold the opinion that lobster abundance is declining and that bag limits are too high, think that the two-day sport season should be abolished.

KEY WORDS: Florida, spiny lobster, recreational fishery

INTRODUCTION

Recreational fishing for the Florida spiny lobster (*Panulirus argus*) is a popular sport, attracting approximately 120,000 fishers annually. Although lobsters are harvested by recreational fishers throughout Florida's coastal waters, approximately two-thirds of the lobster fishers fish in the Florida Keys (Monroe County).

Since 1975, the State of Florida has administered a special two-day recreational spiny lobster season prior to the beginning of the regular commercial and recreational-fishing season. This special two-day sport season was originally designed to remove some of the pressure from the opening day (August 6) of the regular season, when many recreational and commercial boats traveled to (and sometimes fought over) the same fishing grounds. The special two-day sport season is conducted on the last Wednesday (midnight) through Thursday (midnight) in July. The bag limit is 12 lobsters per person per day, except in Monroe County, where the limit is six lobsters per person per day. Diving at night is banned in Monroe County

but permitted elsewhere. These different regulations were established in response to requests, mainly by Monroe County residents, to attempt to reduce the influx of people into the Keys. Prior to 1993, the statewide bag limit was six lobsters per person per day, and the special two-day sport season occurred on the last Saturday and Sunday of July.

The Florida Marine Research Institute has conducted a mail survey about the special two-day sport season since 1991. We found that the harvest remained steady at approximately 300,000 lobsters statewide with 60% harvested in the Keys. One poor harvest (200,000 lobsters in 1995) was attributable to bad weather (storms and 20+ knot winds) on the second day of the season.

We recently revised our annual special two-day sport season questionnaire so that we could determine how various user groups (principally those who travel to fish for lobsters and those who fish local waters) perceive the special two-day sport season and lobster fishing in general. The survey now contains several fishery-issue questions concerning bag limits and the continuation of the special two-day sport season. We also ask for the respondent's perceptions concerning the abundance of lobsters and the number of commercial traps.

METHODS

Survey methods followed procedures defined by Dillman (1979). Within a week of the conclusion of the special two-day sport season, we mailed 2000 questionnaires with cover letters to current lobster permit holders within the United States. Lobster permit holders were randomly picked from ten geographic strata (Figure 1). Each questionnaire recipient received a follow-up postcard one week later, and seven weeks after the initial mailing, nonrespondents received a reminder letter and another questionnaire. This technique consistently resulted in a 60% response rate.

Harvest estimates were calculated using the means of the catch rate, size, and the number of unlicensed fishers within each group of fishers. Details of each step of the calculations can be found in Sharp et al. (in press). A computer program performing 1000 Monte Carlo randomizations of the survey provided a sampling error term for each harvest estimate. Analytical and descriptive computations were performed by using SPSS.

Five new questions about the special two-day sport season and the lobster fishery in general were added to this survey:

- i) Should the special two-day sport end be ended, restricted, continued without change, or broadened?
- ii) Should the season be moved to the weekend?
- iii) Are bag limits too high or low?
- iv) Are spiny lobsters more or less abundant than five years ago?
- v) Have the number of traps in the water increased, stayed the same, or declined over the past five years?

The responses to these questions along with the respondent's resident region

were analyzed using nonlinear canonical correlation to determine patterns in the respondents' answers and to associate patterns of responses to resident regions. The responses to these five questions, the corresponding resident region, and whether or not the respondent fished were entered as single nominal sets.

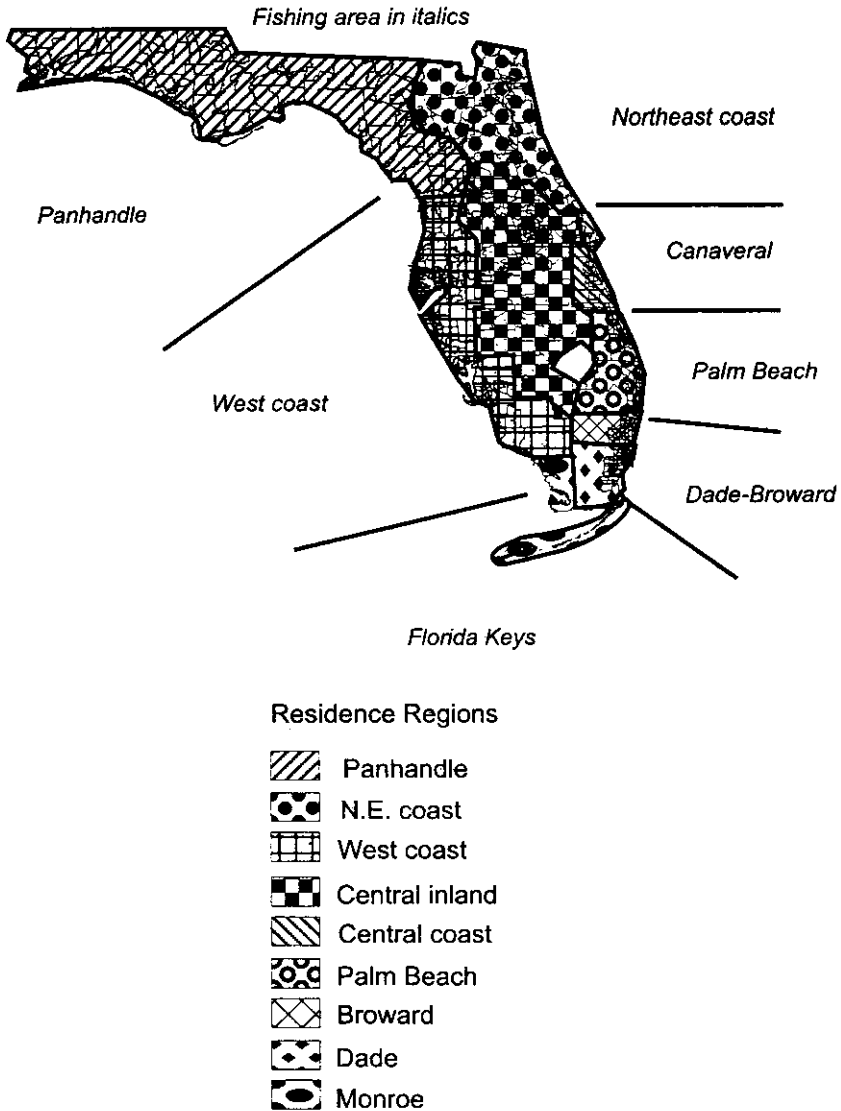


Figure 1. Residence regions used in surveys (based on zip codes - one additional residence region encompasses all zip codes outside Florida).

RESULTS

The largest per-capita concentration of lobster permit holders resided in Monroe county where 196 of 1,000 persons purchased the permit (Table 1). This was an order of magnitude greater than anywhere else in the state, but in spite of the high popularity of the permit in Monroe County, represented only 13% of total sales. Total per-capita sales of the permit were generally above average (more than 10 per 1,000 persons) on the east coast of Florida, from Miami to Cape Canaveral. For the remainder of Florida, sales were greatest along the west coast of Florida. On a per-capita basis, sales of the lobster permit to non-Floridians were less than one sale per 1,000 but the total number of permits sold to non-Floridians were of the same order of magnitude as the total number of permits sold to Monroe County residents (13 to 16 thousand, respectively).

The overall participation rate for the 1998 special two-day sport season was 31% (Table 1). Participation rates generally followed the pattern of stamp sales. Monroe, Dade, Broward, and Palm Beach counties had the highest (approximately 40%) participation rates and the other areas had participation rates of 10 to 30%.

The estimated harvest statewide was more than 314,000 lobsters (Table 2). The bulk of the harvest (60%) came from the Florida Keys (more than 189,000 lobsters). An average of nearly 39,000 fishers were on the water each of the two days with 69% of them fishing in the Keys (Table 3). In most areas, the local residents harvested the majority of the lobsters (>90%) (Figure 2), but in the Keys, travelers as a whole harvested the majority of the lobsters even though the group comprising local residents (23%) was larger than any other single regional group of fishers. Travelers from the west coast (22%) and Palm Beach (18%) account for the majority of the Keys harvest by non-locals.

We estimate that those who traveled to the Keys to participate in the special two-day sport season spent approximately 2.3 million dollars over the course of their trip (Table 4). The bulk of the money was spent by those from the west coast of Florida (0.8 million). The length of stay of a nonresident was typically between four and seven days. The length of stay was longest for those traveling from outside Florida (10 days) and shortest for those from neighboring Dade County (2 days). More than 2,500 boats were trailered into the Keys for the special two-day sport season, with the majority coming in from the west coast (880 boats). Those traveling from out of state and those traveling from Dade and Palm Beach Counties were the most likely to have a second home there or be staying at a friend's house. Motels and vacation rentals made up the bulk of accommodations for those from the central and west coast portions of the state. Those who traveled the greatest distances to get to the Keys tended to travel farther into the Keys than did those who came in from a short distance (Figure 3).

Table 1. Demographics of lobster permit sales and participation in the 1998 special two-day sport season.

| Residence Region | Population* (x1000) | Lobster** permits | Permits per 1000 persons | Percent*** participation |
|------------------|---------------------|-------------------|--------------------------|--------------------------|
| Outside Florida | | 12,924 | | 7 |
| Panhandle | 1,357 | 4,350 | 3 | 18 |
| N.E. coast | 1,811 | 4,913 | 3 | 27 |
| West coast | 3,666 | 22,092 | 6 | 27 |
| Central inland | 2,404 | 8,355 | 3 | 30 |
| Centr. E. coast | 612 | 10,451 | 17 | 29 |
| Palm Beach | 1,328 | 12,986 | 10 | 45 |
| Broward | 1,503 | 10,545 | 7 | 36 |
| Dade | 2,152 | 24,314 | 11 | 36 |
| Monroe | 81 | 15,896 | 196 | 43 |

*Estimated 1998 population obtained from U.S. Census Bureau (<http://www.census.gov/index.html>)

**Numbers represent our estimated partitioning of valid permits during the 1998 special two-day sport season; total number of permits was 126,826

***Overall estimated percentage of participation of lobster permit holders was 31%.

Table 2. Estimated number of lobsters harvested by recreational fishers during the 1998 special two-day sport season, by residence region of the fisher and by fishing area. Cells marked "nd" indicate that questionnaire responses were not received for that residence region and fishing area.

| Resident Region | Fishing area | | | | | | Totals |
|-----------------|--------------|--------------|------------|-----------|-----------|---------|--------|
| | Keys | Dade-Broward | Palm Beach | Canaveral | Elsewhere | Totals | |
| Outside Florida | 2,997 | nd | nd | nd | nd | 2,997 | |
| Panhandle | 5,963 | nd | nd | nd | 80 | 6,043 | |
| N.E. coast | 4,520 | 61 | nd | nd | 703 | 5,284 | |
| West coast | 41,250 | nd | 243 | nd | 862 | 42,355 | |
| Central inland | 19,235 | nd | nd | 2,875 | 1,494 | 23,604 | |
| Central coast | 11,071 | nd | 3,379 | 10,252 | nd | 24,702 | |
| Palm Beach | 33,433 | 2,821 | 14,712 | nd | nd | 50,966 | |
| Broward | 7,720 | 22,886 | nd | nd | nd | 29,606 | |
| Dade | 20,536 | 46,470 | nd | nd | nd | 67,006 | |
| Monroe | 42,542 | 204 | nd | nd | nd | 42,746 | |
| Totals | 189,267 | 72,381 | 18,334 | 13,127 | 3,139 | 314,582 | |

Table 3. Estimated number of fishers by residence region and fishing areas during the 1998 special two-day sport season. Cells marked "nd" indicate that questionnaire responses were not received for that residence region and fishing area. Because not everyone fished both days, the number indicates the average number of fishers on the water for both days.

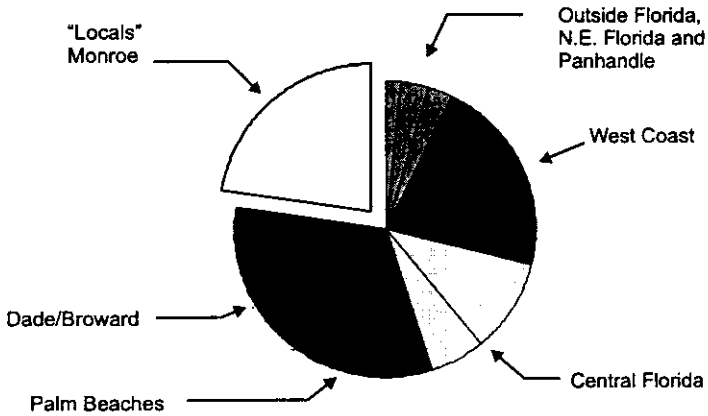
| Residence Region | Fishing areas | | | | | | Totals |
|------------------|---------------|--------------|------------|-----------|-----------|--------|--------|
| | Keys | Dade-Broward | Palm Beach | Canaveral | Eisewhere | Totals | |
| Outside Florida | 952 | nd | nd | nd | nd | 952 | |
| Panhandle | 812 | nd | nd | nd | 40 | 850 | |
| N.E. coast | 1,021 | 41 | 61 | nd | 202 | 1,325 | |
| West coast | 5,639 | nd | nd | 58 | 359 | 6,056 | |
| Central inland | 2,362 | nd | nd | 210 | 188 | 2,760 | |
| Central coast | 1,178 | nd | 630 | 1,112 | nd | 2,910 | |
| Palm Beach | 4,182 | 191 | 2,110 | nd | nd | 6,483 | |
| Broward | 1,018 | 2,167 | nd | nd | nd | 3,185 | |
| Dade | 3,066 | 4,637 | nd | nd | nd | 7,703 | |
| Monroe | 6,466 | 90 | nd | nd | nd | 6,556 | |
| Totals | 26,696 | 7,126 | 2,801 | 1,380 | 977 | 38,980 | |

Table 4. Estimated economic impacts of those who traveled to the Florida Keys to fish during the special two-day sport season.

| Residence Region | Money spent (dollars) | Length of stay (days) | Boats trailerred | Motel | Accommodations (percent) | | | 2 nd /friend home |
|---------------------|-----------------------------|-----------------------------|---------------------|-------|--------------------------|----------------|----------------|---------------------------------|
| | | | | | Rental | Camp/ other | Camp/ other | |
| Outside Florida | 120,000 | 10 | 28 | 29 | | | 71 | |
| Panhandle | 91,650 | 4 | 44 | 29 | 14 | 43 | 14 | |
| N. E. coast | 132,160 | 7 | 123 | 25 | 50 | 13 | 12 | |
| West coast | 821,700 | 5 | 880 | 32 | 29 | 30 | 10 | |
| Central inland | 330,720 | 5 | 403 | 37 | 37 | 15 | 11 | |
| Central coast | 108,400 | 7 | 134 | | 43 | 29 | 29 | |
| Palm Beach | 434,520 | 4 | 551 | 17 | | 33 | 40 | |
| Broward | 89,400 | 4 | 86 | 17 | | 33 | 17 | |
| Dade | 209,400 | 2 | 300 | 33 | | 20 | 47 | |
| Totals | 2,337,950 | | 2,549 | | | | | |

*Median length of stay

Keys Harvest



Dade and Broward Harvest

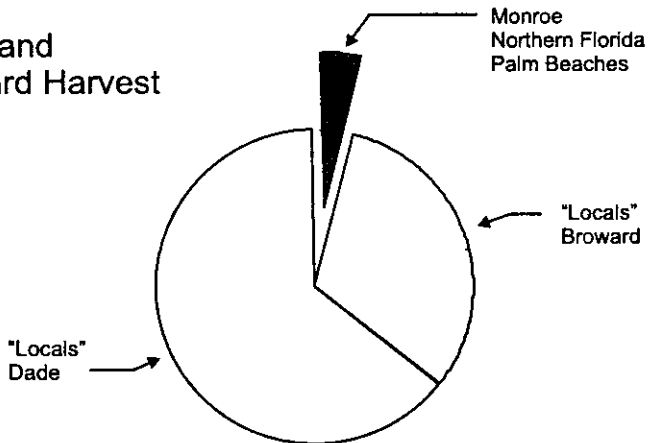


Figure 2. Pie charts representing proportions of the total lobster harvest in the Keys and Dade-Broward fishing areas harvested by fishers from the various residence zones. Portions of the harvest taken by residents from outside the fishing area are shaded, and harvest by "Locals," those residing in the fishing area, are shown in white.

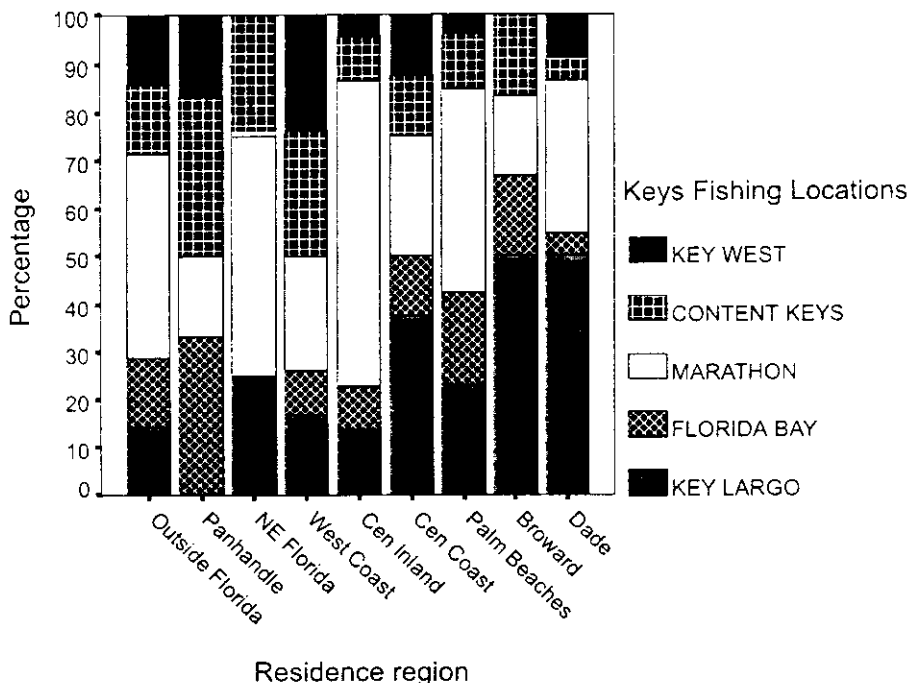


Figure 3. The percentage of fishers by residence region fishing in different locations within the Keys. Residence regions are arranged so that distance traveled to the Keys decreases from left to right (i.e. residents of regions Outside Florida and the Panhandle traveled the longest distances and those from Dade traveled the shortest distance). Destinations within the Keys are arranged so that distance traveled within the Keys increases from bottom to top (i.e., Key Largo is the shortest distance into the Keys and Key West is the farthest).

The nonlinear canonical correlation analysis used to determine the relationships between these variables revealed three basic groups as shown by the component loadings of the variables (Figure 4). Group 1 was based on respondents' answers to whether or not they fished and to their perception concerning whether the number of traps has increased or decreased over the past five years. Those who fished generally expressed the opinion that the number of traps had decreased whereas

those who did not fish were more likely to express an opinion that the number of traps had increased (Figure 5A). Group 2 was based on the respondents' area of residence and opinions concerning whether the special two-day sport season should be moved to the weekend. Those living in the Keys and south Florida were generally against moving the sport season back to the weekend, whereas those from near the middle of the state were neutral and those living along the west coast, north Florida, and outside Florida were more likely to express the opinion that the sport season should be moved to the weekend (Figure 5B). Group 3 was based on responses to the bag-limit question, perceptions of lobster abundance, and responses concerning the future of the special two-day sport season. Opinions about the future of the special two-day sport season range from "end it now" to "keep it forever". Although the opinion that the special two-day sport season be ended was strongest in the Keys (50% held that view), residency was not the strongest factor associated with this opinion. Regardless of where those in group 3 live, the respondents who believed that the abundance of lobster is declining and that bag-limits are too high are the most likely to express the opinion that the special two-day sport season be ended (Figure 5C).

Component Loadings

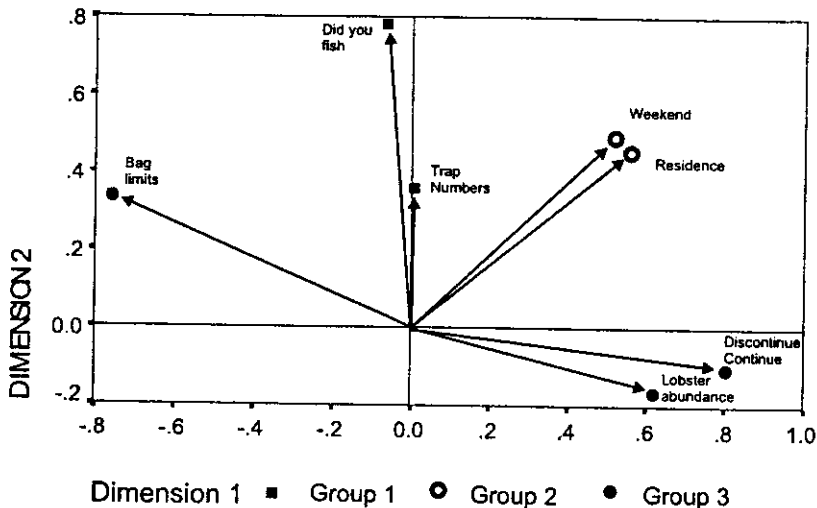
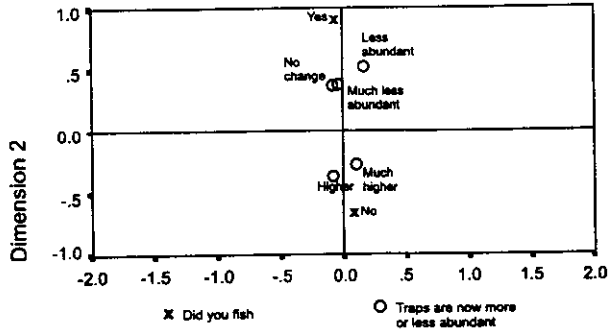


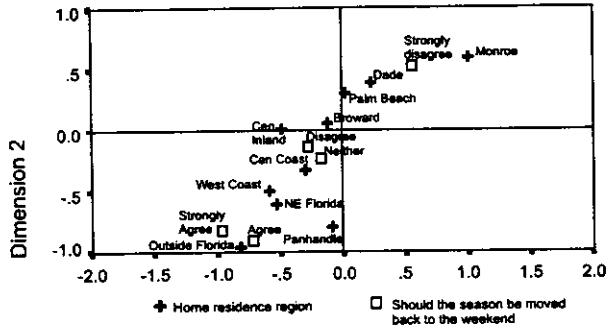
Figure 4. Component loadings results of the nonlinear canonical correlation analysis of fishery issue questions and residence regions. Each mark on the chart represents the component loadings for one of six fishery-related questions (see text) and the residence region. Groupings were determined by inspection and were comprised of component loadings that have nearly the same angle or are nearly 180° away from the origin.

Multiple Category Coordinates

A



B



C

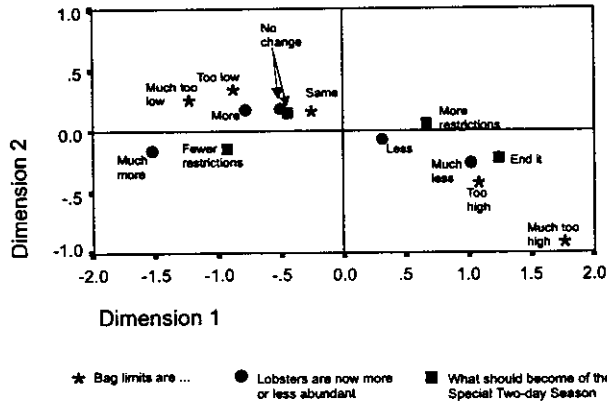


Figure 5. Multiple Category Coordinates for Group 1 (A), Group 2 (B), and Group 3 (C). Each mark on these charts represents the coordinates for each possible response to the six fishery questions. See text for an explanation of the relationship of the responses.

DISCUSSION

Since its inception in 1975, the special two-day sport season has attracted many lobster fishers to the Keys. The Florida Keys remain a popular destination because they contain a large population of spiny lobsters, large areas of shallow water with lobsters, and a long reef tract that attracts both divers and snorkelers. In addition, the Florida Keys Tourism Board advertises the event to attract visitors. In spite of the divided opinions about the season, especially among Monroe County residents, satisfaction about the fishing experience remains high among those who fish (Bertelsen and Hunt 1991, FMRI, unpub. data).

The special two-day sport season was created to alleviate problems, primarily in the Keys, caused by the large number of both recreational and commercial fishers who harvest lobsters on the opening day of the regular season. An assumption was that a miniature recreational-only season held on a weekend prior before the opening of the regular season should mitigate some of the recreational "opening day fever" that overwhelmed the fishery on the opening day. Subsequent modifications (moving the special season to midweek and increasing bag limits outside the Keys) were instituted to reduce the overall level of participation in the Keys. Unfortunately, there were no surveys made prior to the modifications that could be used to assess these modifications. However, previous surveys have shown that approximately one third of those who fish the special two-day season do not fish during the regular season (FMRI unpub. data). This suggests that many recreational fishers do satisfy their "opening day fever" during the special two-day sport season. However, a popular perception expressed on our surveys and at public hearings concerning lobster fishing is that the special two-day sport season and opening day are as crowded as ever. If this is true, perhaps the reason is that recreational lobster fishing has grown enough to populate both events. Answers to trends in popularity of the two events are beyond the scope of this paper, but future analyses that integrate patterns of movements by fishers since 1992 may be able to determine if perception and our mail surveys agree or disagree.

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