

## **Spatial distribution of headboat trips from the Florida Keys with emphasis on Gag and Black Grouper**

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January 2006  
Contribution SFD-2006-009

### **INTRODUCTION**

Geographic Information Systems (GIS) software was used to look at the spatial distribution of headboat data to gain a better understanding of where the fishing is occurring in each area designation.

### **METHODS**

In the Headboat Survey, the Florida Keys is represented by areas 12, 17, and 18. Area 18 (Dry Tortugas- Gulf-based vessels) is assumed to be part of the Gulf of Mexico. Areas 12 and 17 are considered Atlantic areas by the Survey and are the focus of this discussion. Area 12 is described as Florida Keys (Atlantic-based vessels) and area 17 as Dry Tortugas (Atlantic/Keys-based vessels).

In the Headboat Survey catch-effort files, the location field specifies where the fishing occurred. When there is a location value present, it is either latitude/longitude (lat/long) in whole degrees or this plus a grid ID which indicates a 10-minute by 10-minute square within each lat/long degree. In 87% of trips for all areas, all effort, and in all years (1973-2004) there is a location value present. For the Keys area in particular, 82% of trips for all effort in all years have a location value. Between 1973 and 1985, there is a location value present in 98% of trips in the Keys for all effort. Between 1986 and 2004 there is a location value present in 77% of trips in the Keys for all effort.

The spatial relationship between the designated area and fishing location for each headboat trip when a location value is present in the catch-effort files is shown in the following maps. Each trip is placed in the center of the 10-minute by 10-minute grid within each lat/long value or in the center of the lat/long degree when no grid ID is present. Location values are shown as they are found in the data and no data corrections were made. In each map the frequency of trips in each location is shown by the use of graduated colors using a natural breaks classification.

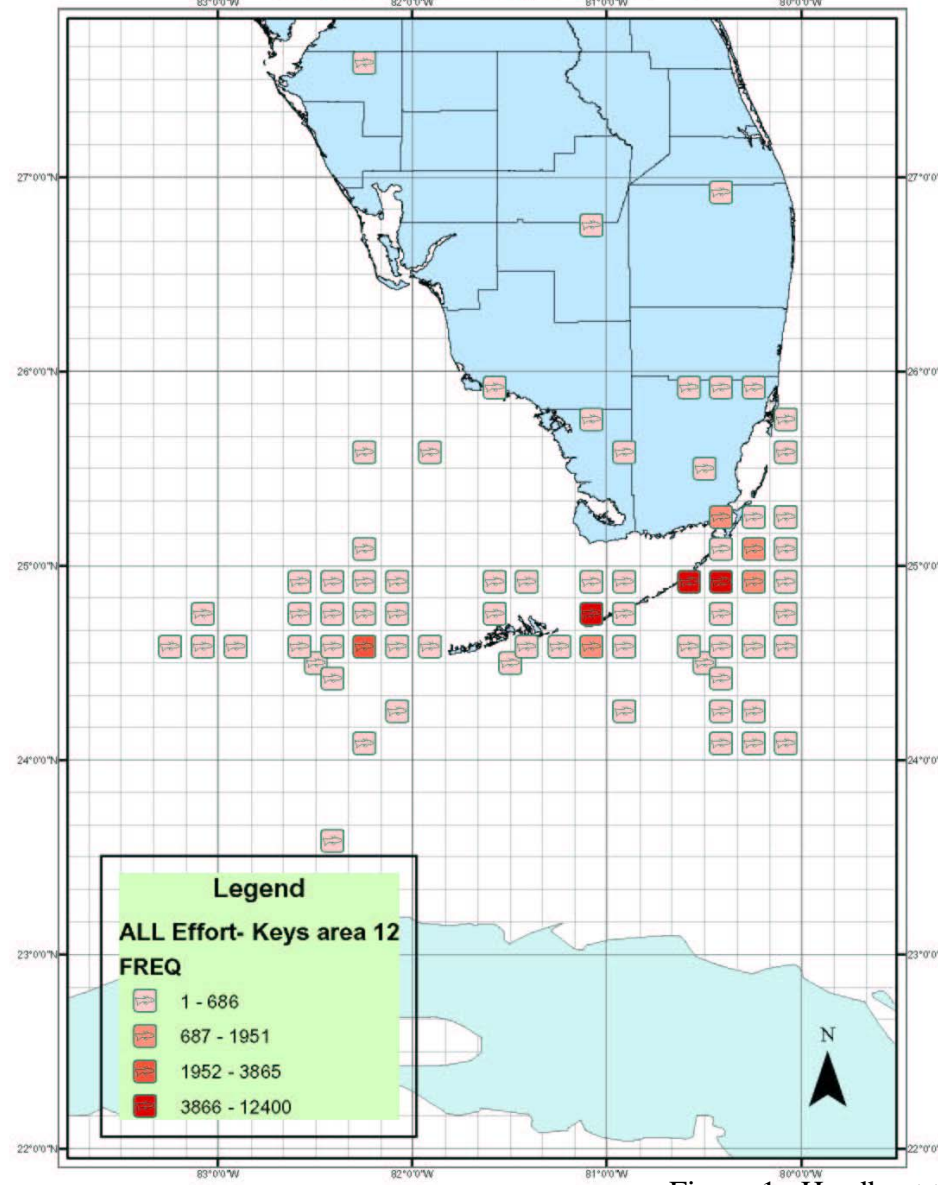
## RESULTS AND CONCLUSIONS

The following series of maps show the frequency of trips in each location stratified by area (12 and 17), species (all effort, gag, and black grouper), and time series (all years, 1973-1985, and 1986-2004). As can be seen throughout all strata, the overwhelming majority of trips in area 17 occur in the Gulf of Mexico. Area 12 is not as straightforward. Throughout all strata trips designated as area 12 occur in both the Gulf of Mexico and the Atlantic Ocean.

## ACKNOWLEDGEMENTS

I would like to acknowledge Sandra Aguilar and Carlos Rivero for providing the 10-minute by 10-minute grid they created to plot Headboat locations.

### Headboat Catch Effort 1973-2004 ALL Effort- Keys area 12



### Headboat Catch Effort 1973-2004 ALL Effort- Keys area 17

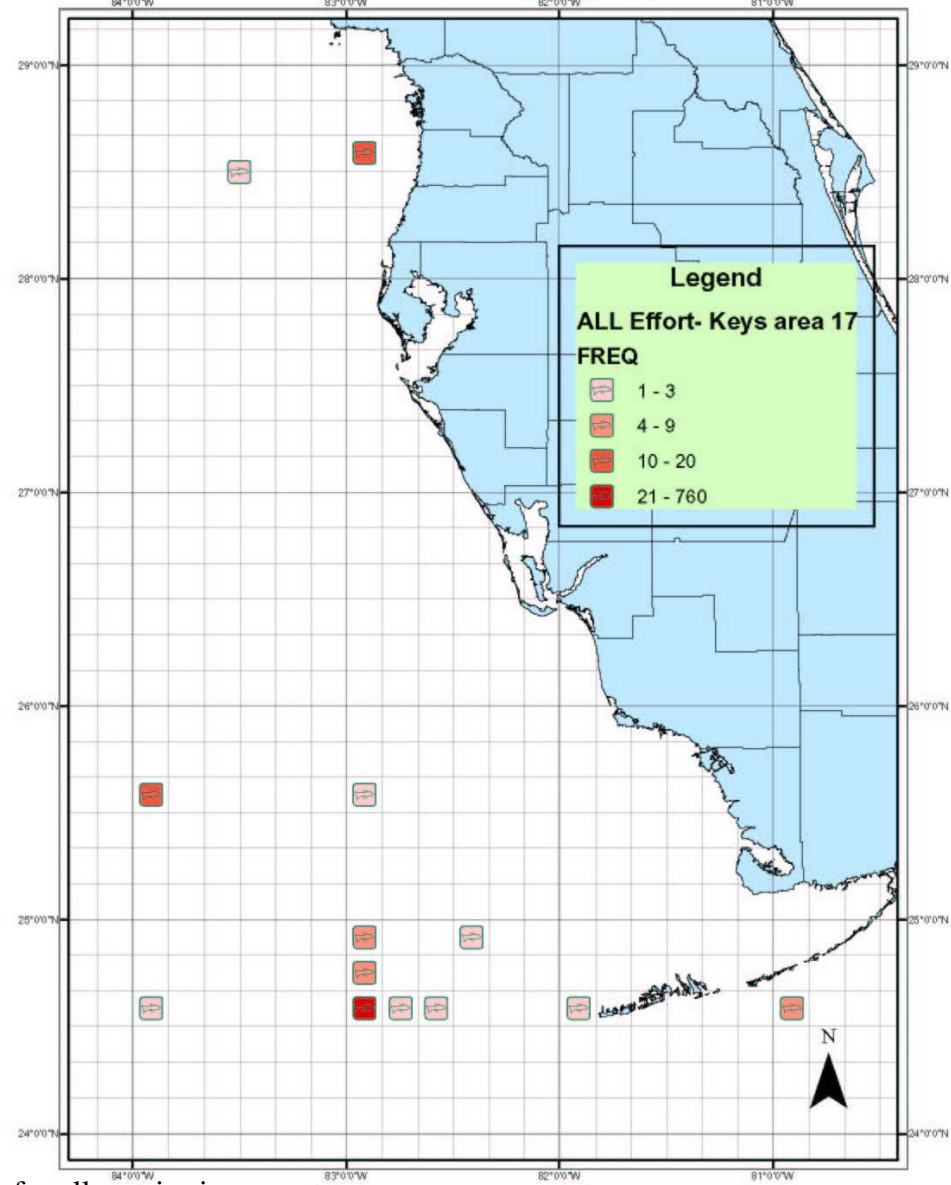
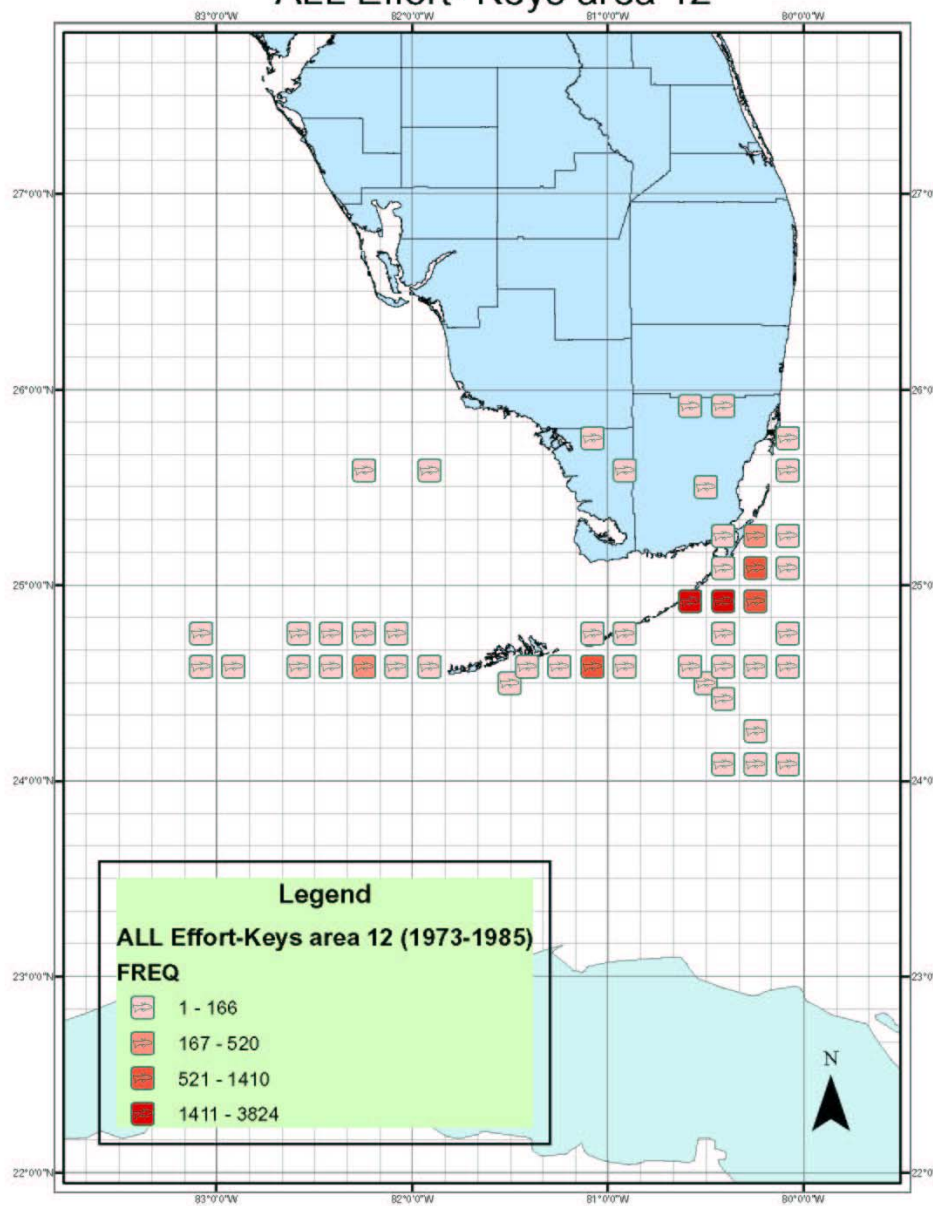


Figure 1. Headboat trips for all species in areas 12 (left) and 17 (right) from 1973-2004.

Headboat Catch Effort 1973-1985  
ALL Effort- Keys area 12



Headboat Catch Effort 1986-2004  
ALL Effort- Keys area 12

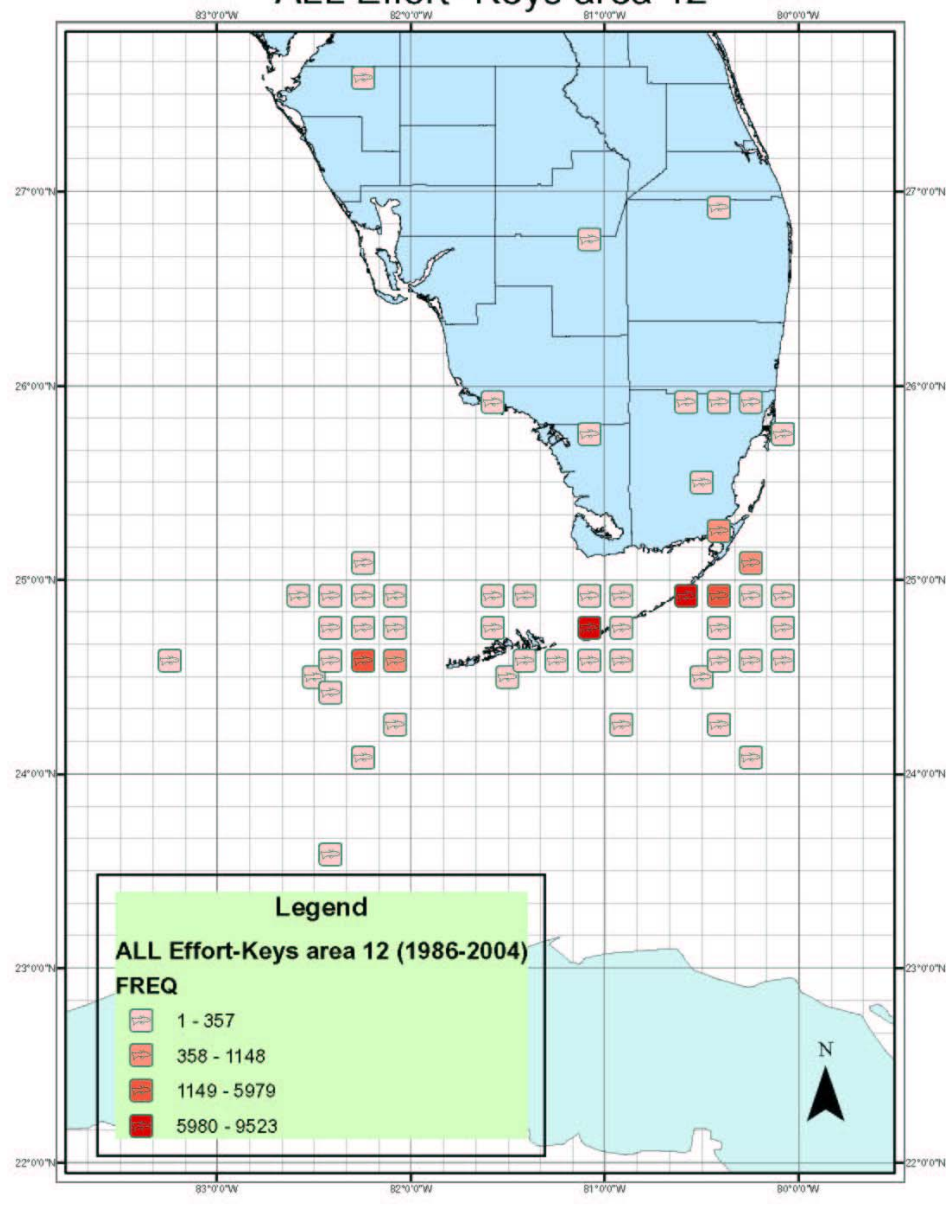


Figure 2. Headboat trips for all species in area 12 from 1973-1985 (left) and 1986-2004 (right).

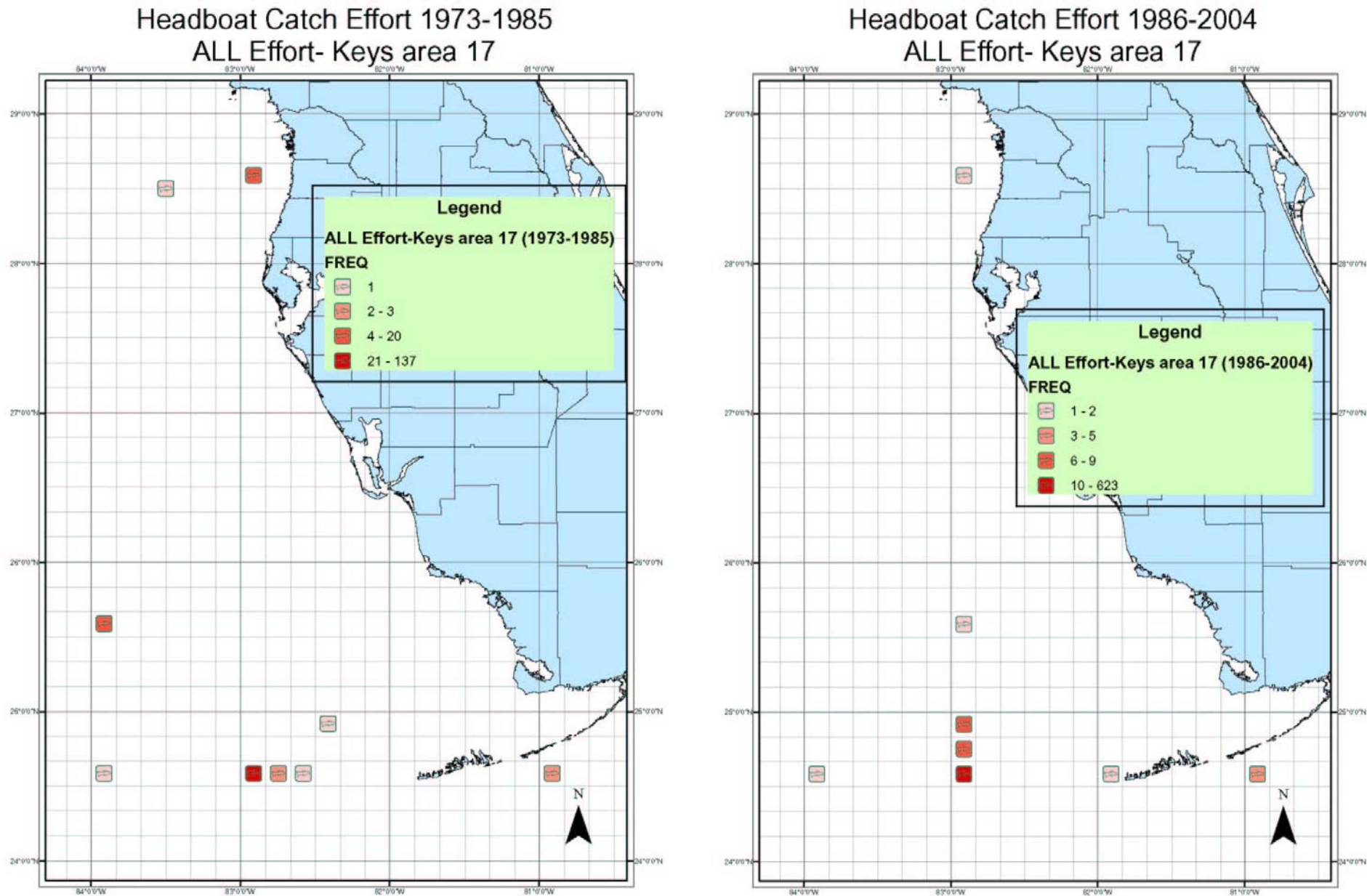
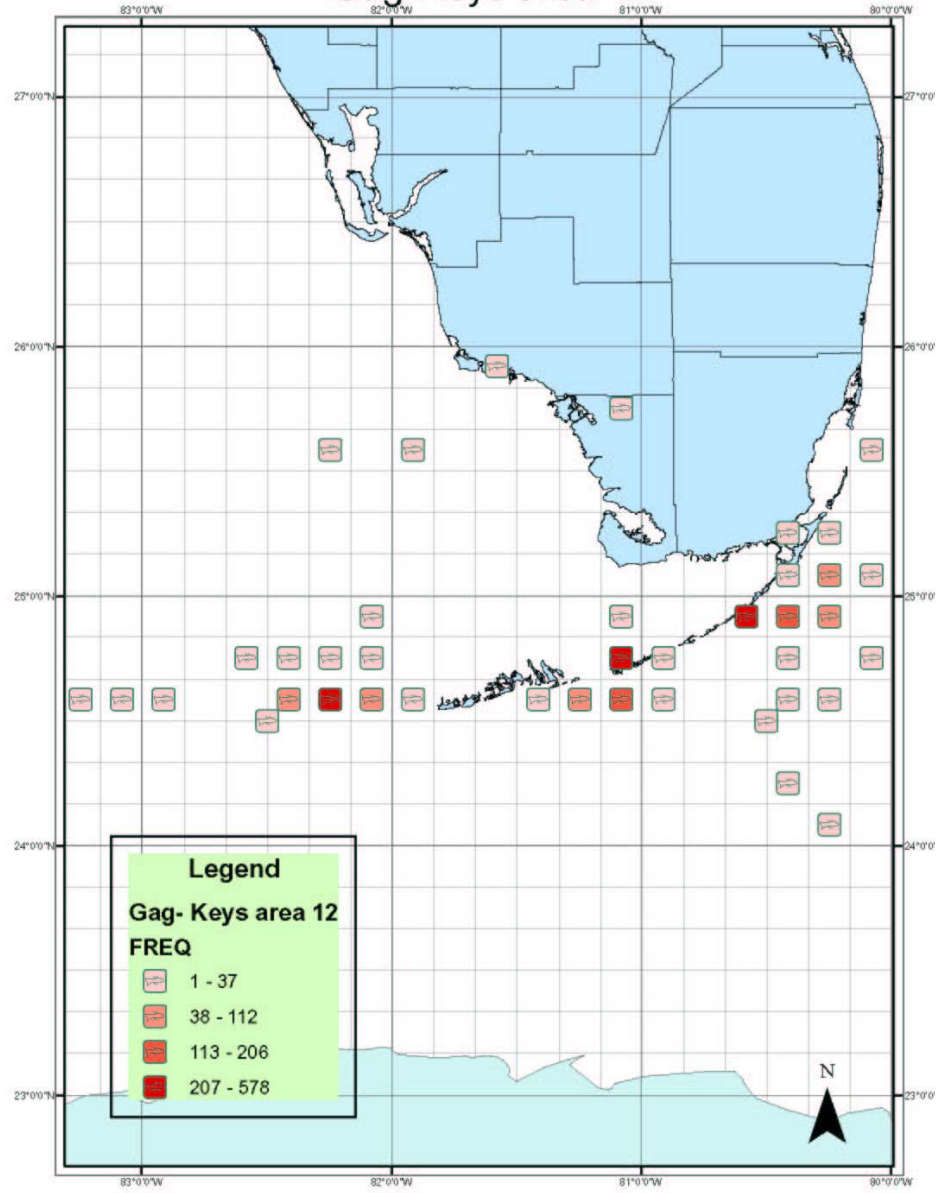


Figure 3. Headboat trips for all species in area 17 from 1973-1985 (left) and 1986-2004 (right).

### Headboat Catch Effort 1973-2004 Gag-Keys area 12



### Headboat Catch Effort 1973-2004 Gag-Keys area 17

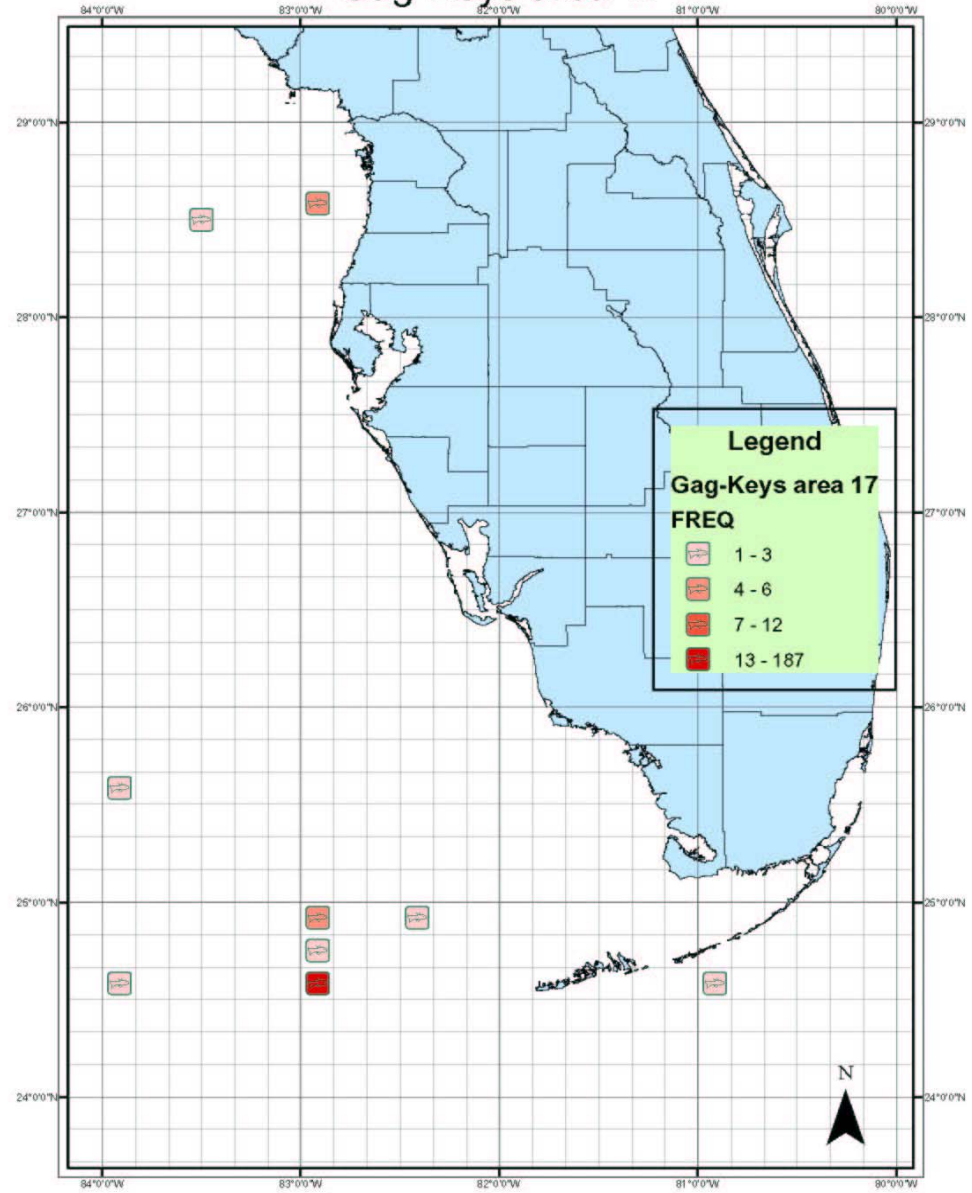
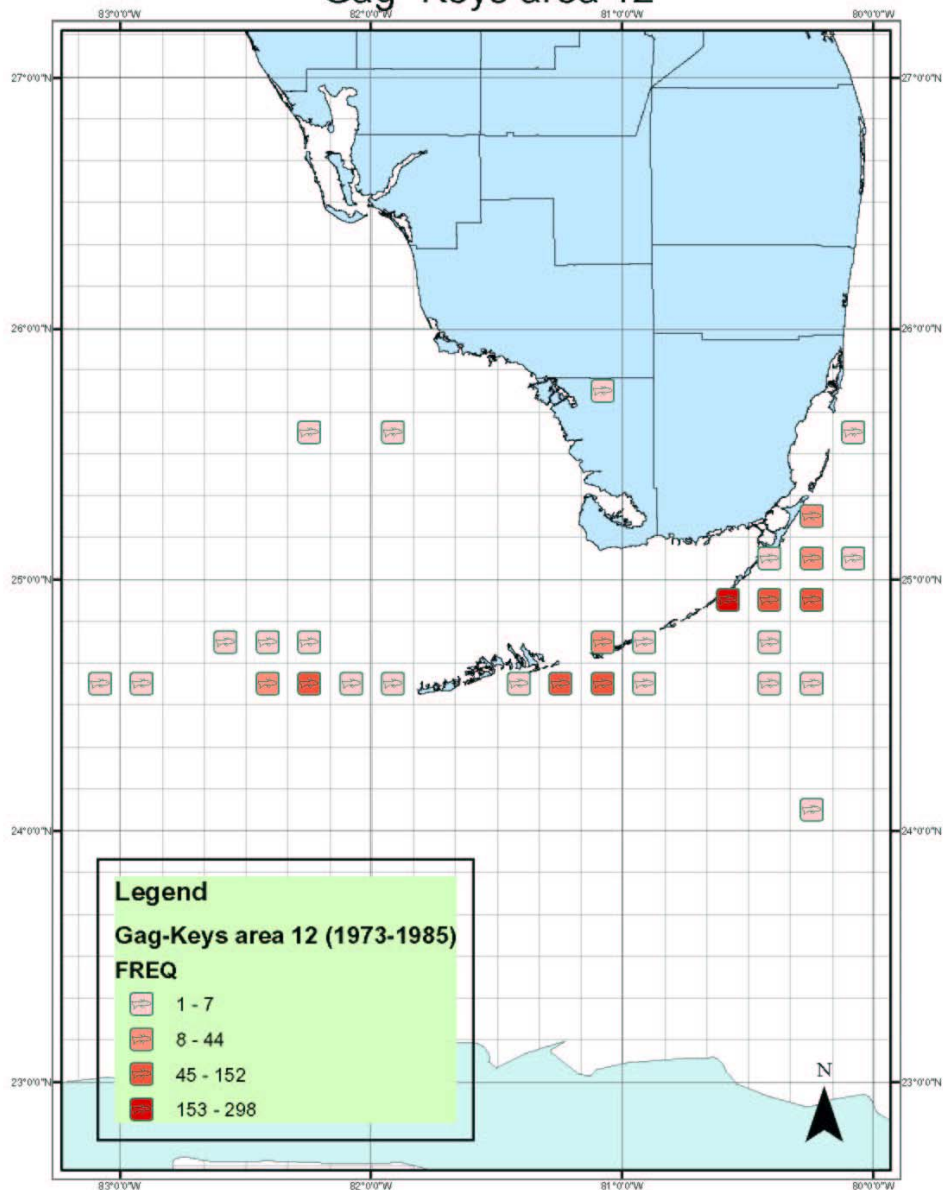


Figure 4. Headboat trips for gag in areas 12 (left) and 17 (right) from 1973-2004.

### Headboat Catch Effort 1973-1985 Gag- Keys area 12



### Headboat Catch Effort 1986-2004 Gag- Keys area 12

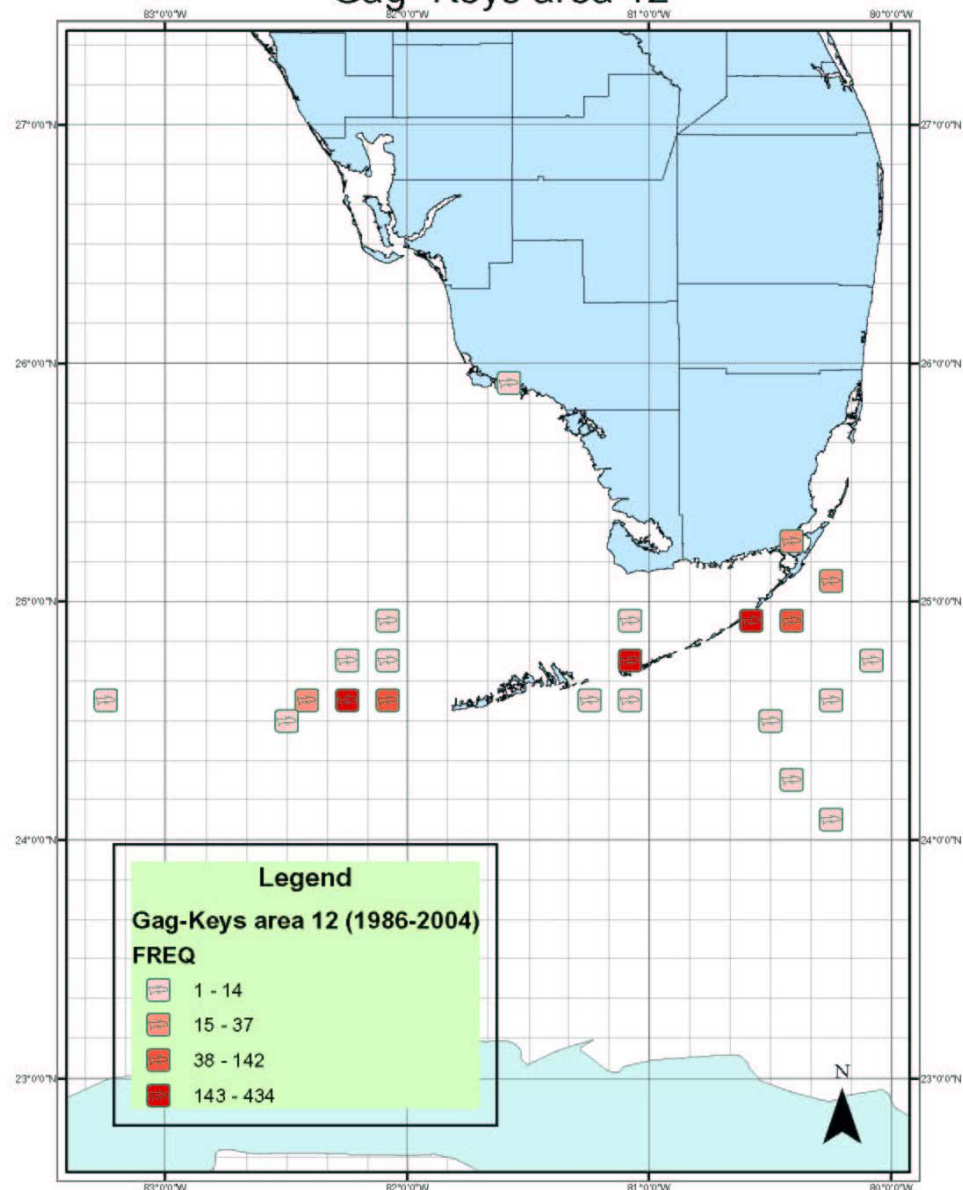
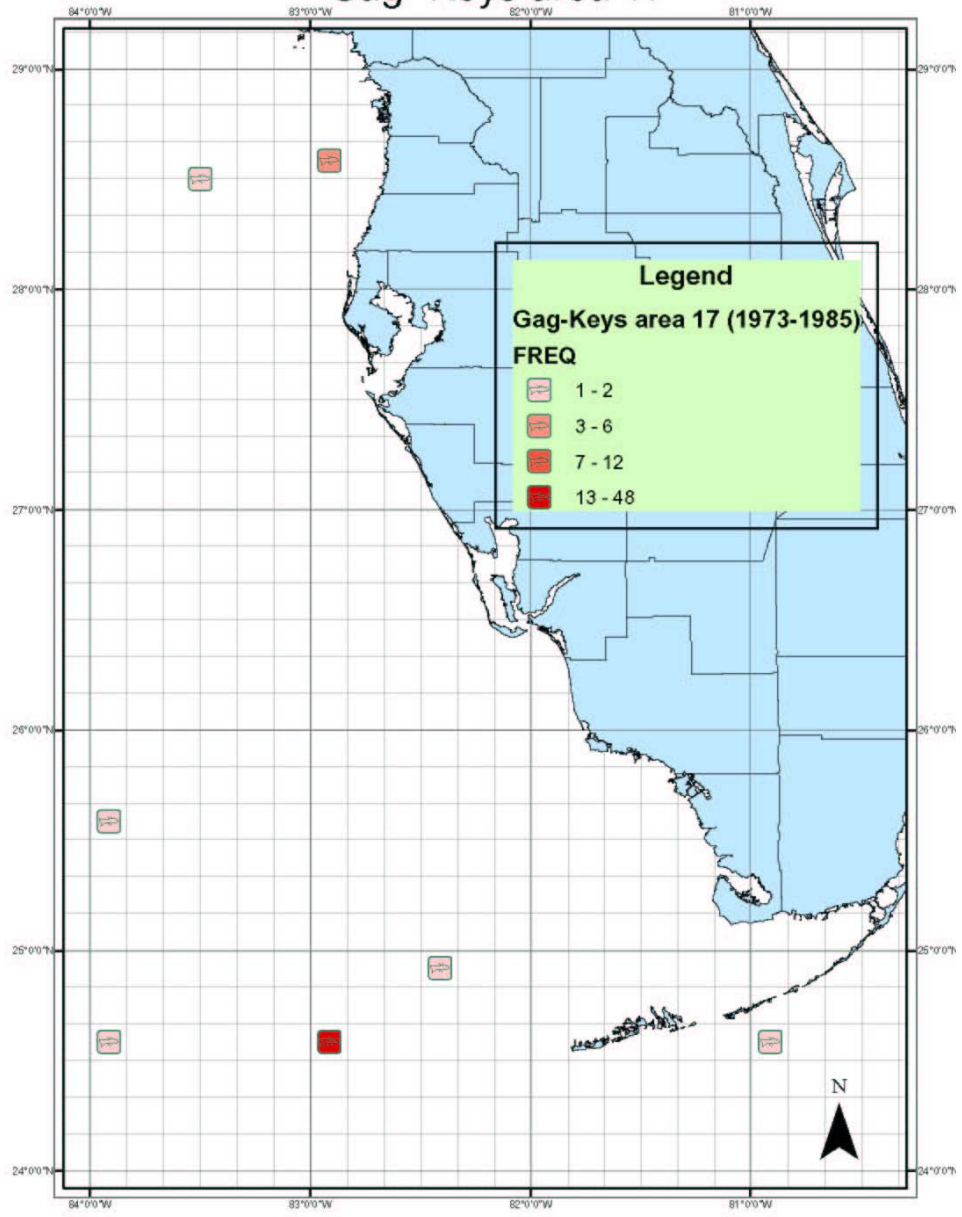


Figure 5. Headboat trips for gag in area 12 from 1973-1985 (left) and 1986-2004 (right).

### Headboat Catch Effort 1973-1985 Gag- Keys area 17



### Headboat Catch Effort 1986-2004 Gag- Keys area 17

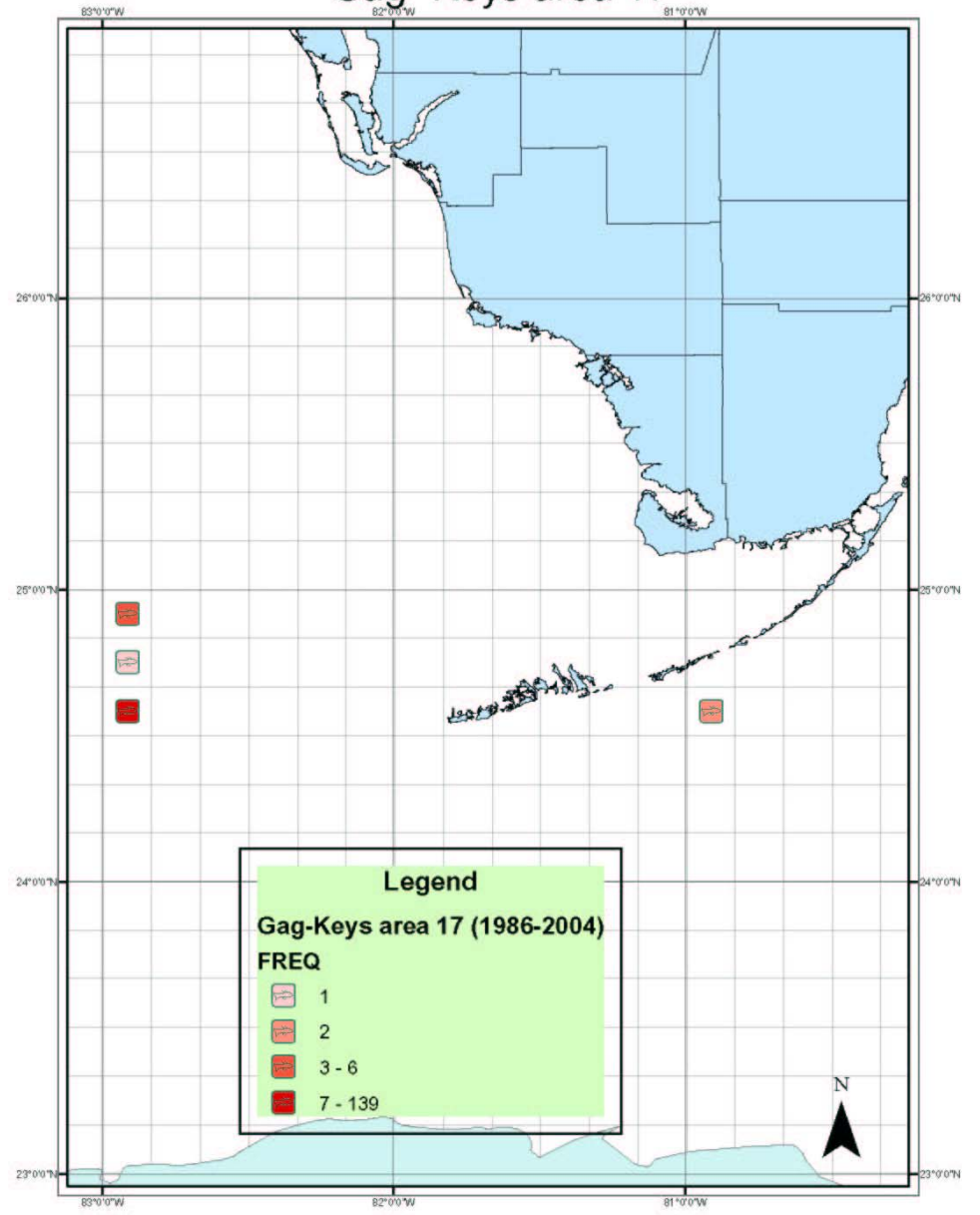
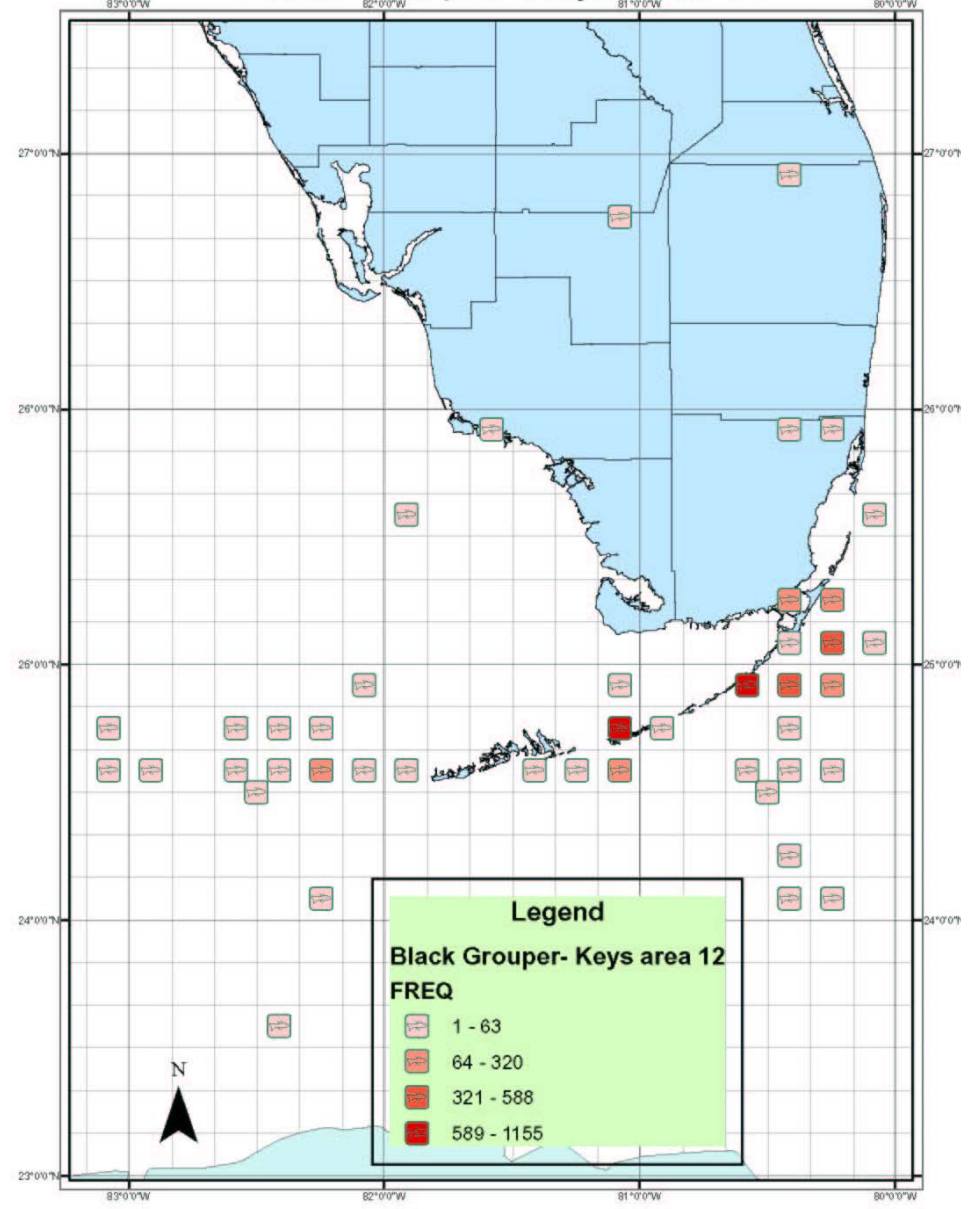


Figure 6. Headboat trips for gag in area 17 from 1973-1985 (left) and 1986-2004 (right).



Headboat Catch Effort 1973-2004  
Black Grouper- Keys area 12



Headboat Catch Effort 1973-2004  
Black Grouper- Keys area 17

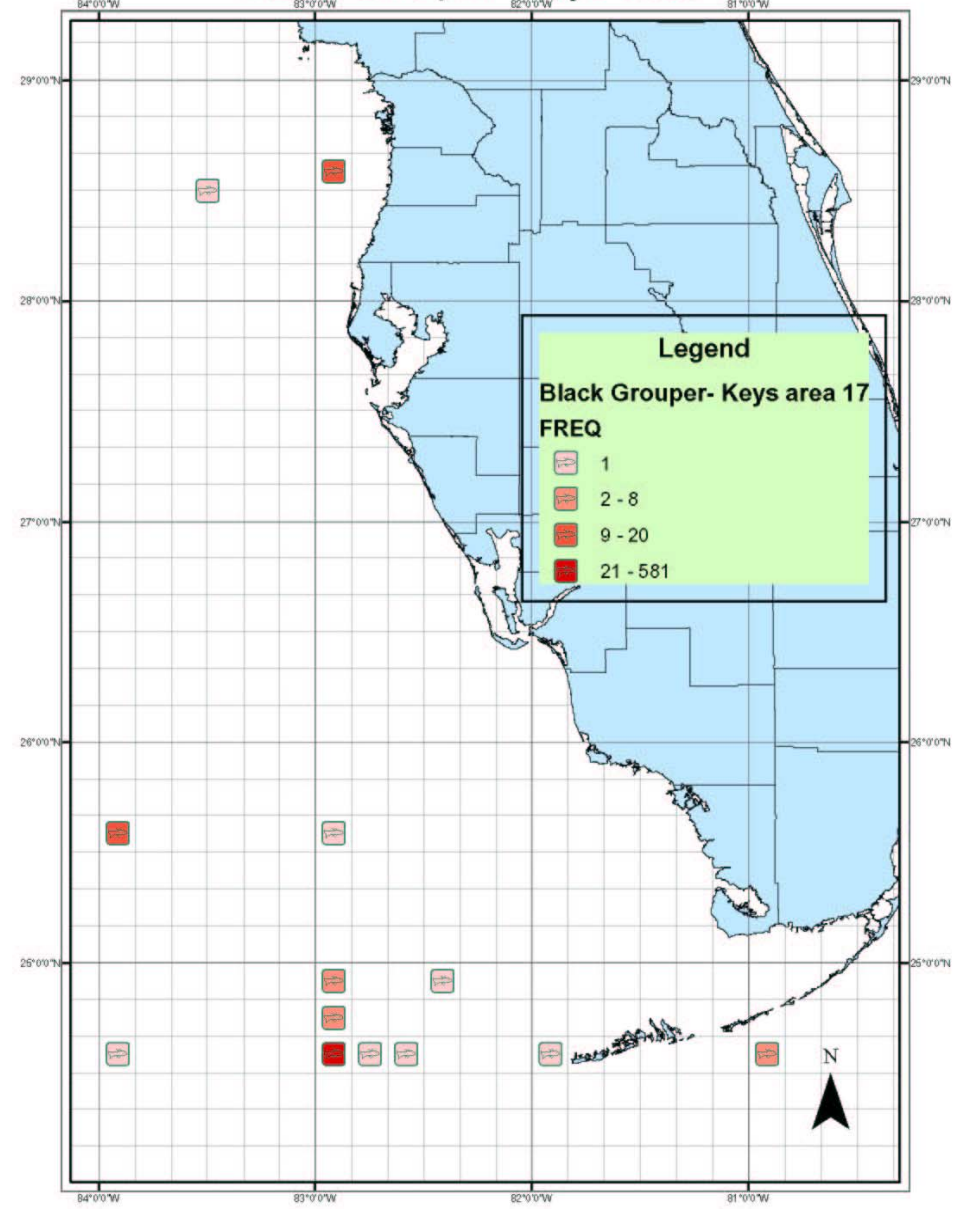
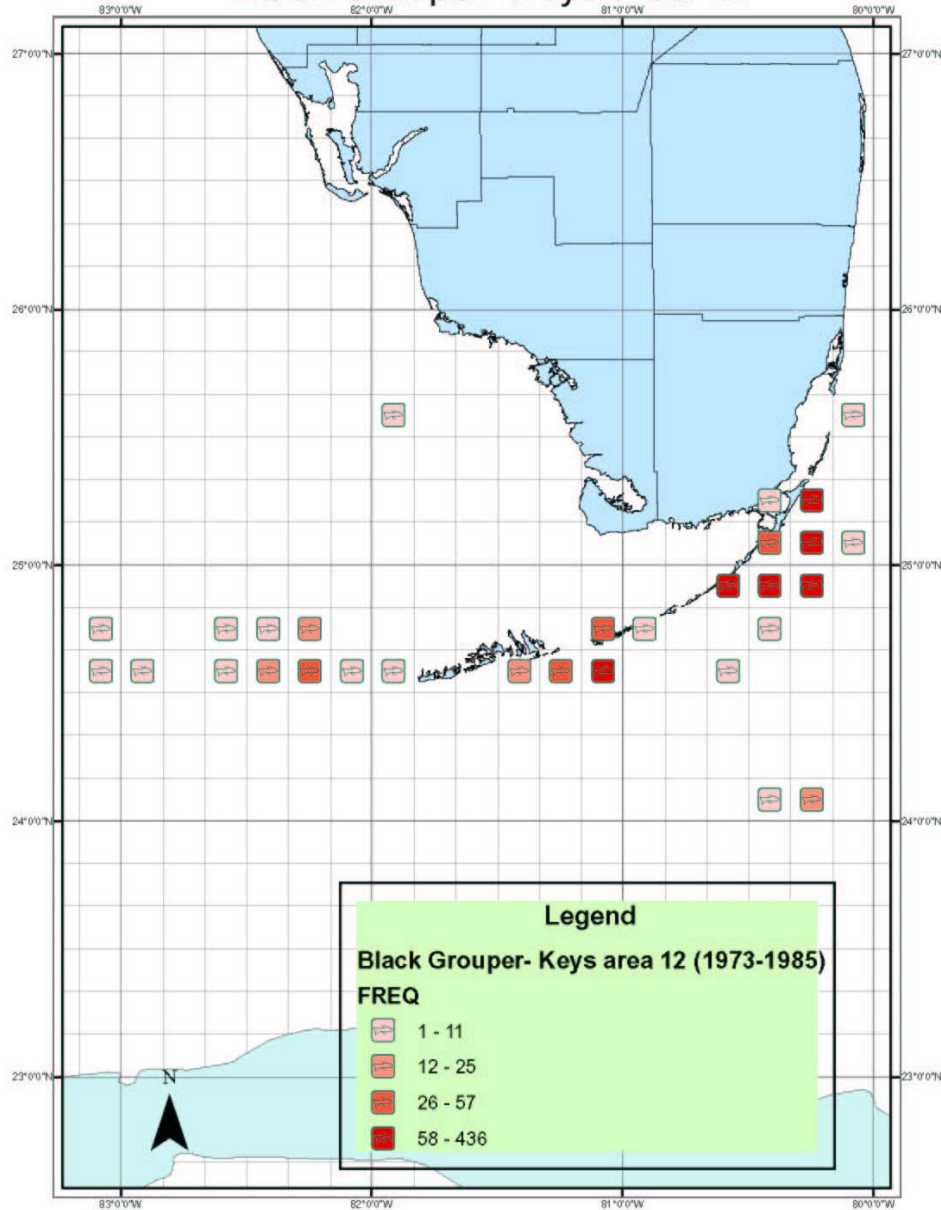


Figure 7. Headboat trips for black grouper in areas 12 (left) and 17 (right) from 1973-2004.

### Headboat Catch Effort 1973-1985 Black Grouper- Keys area 12



### Headboat Catch Effort 1986-2004 Black Grouper- Keys area 12

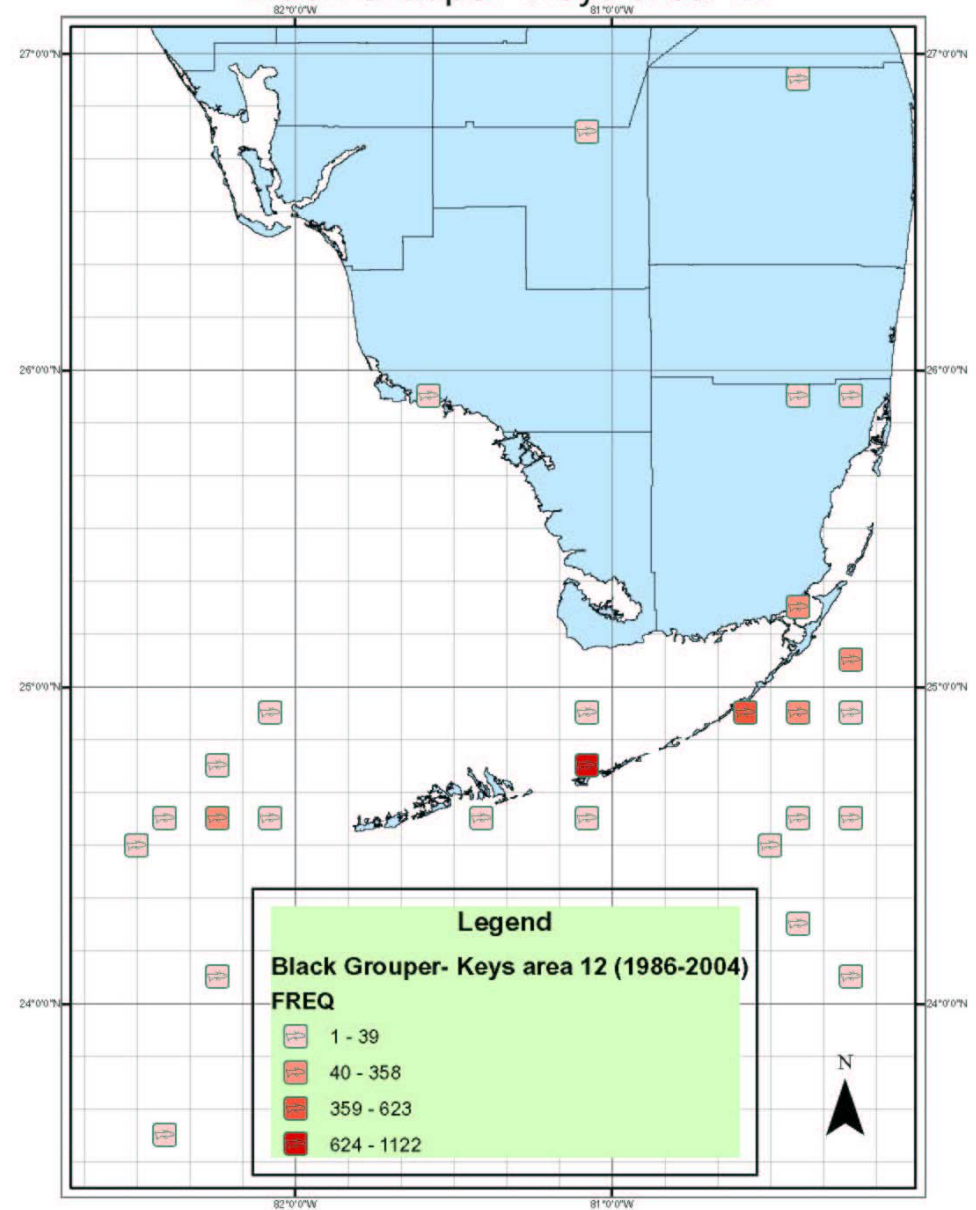
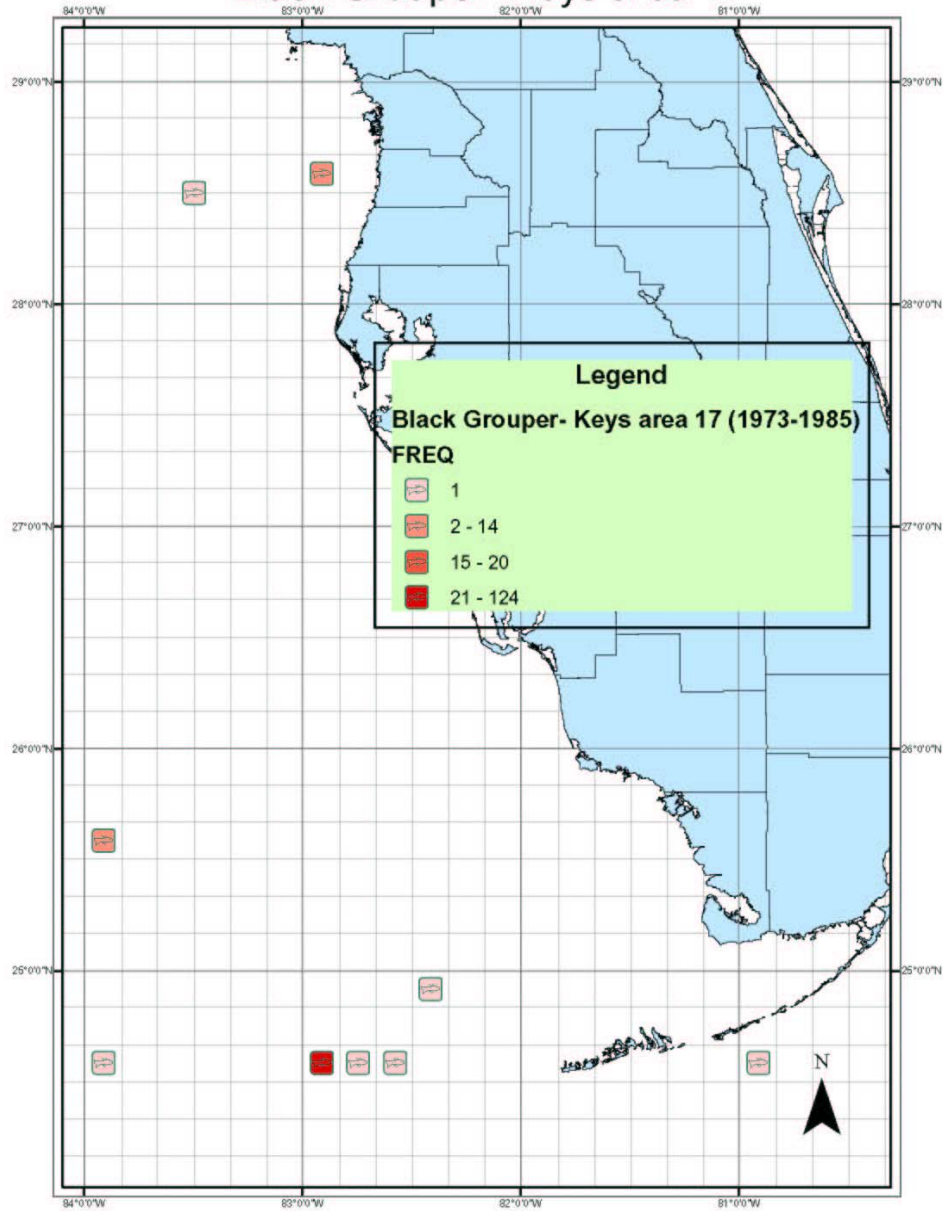


Figure 8. Headboat trips for black grouper in area 12 from 1973-1985 (left) and 1986-2004 (right).

Headboat Catch Effort 1973-1985  
Black Grouper- Keys area 17



Headboat Catch Effort 1986-2004  
Black Grouper- Keys area 17

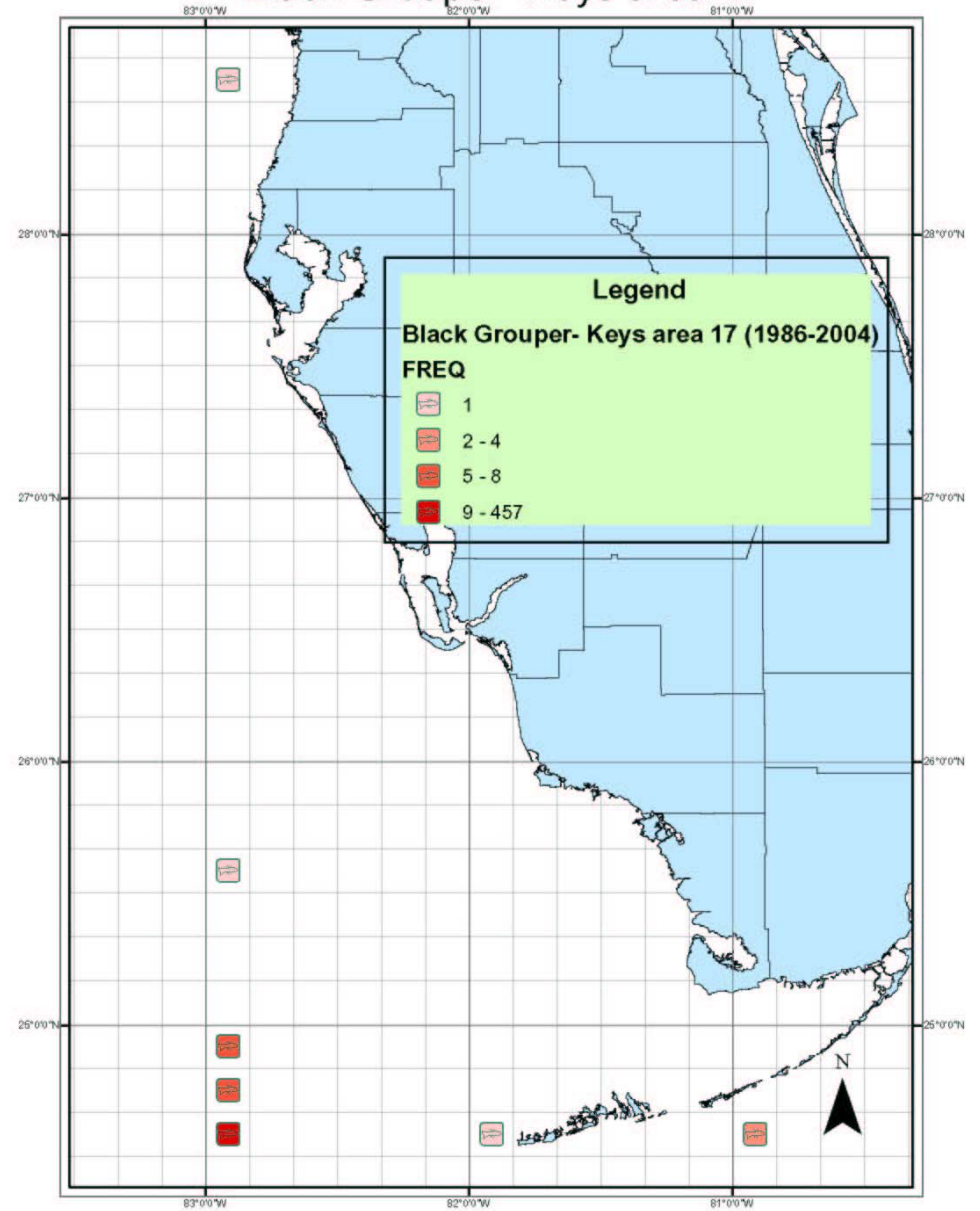


Figure 9. Headboat trips for black grouper in area 17 from 1973-1985 (left) and 1986-2004 (right).