

Pulley Ridge - A New Discovery for Scientists and an Old Discovery for Fishers

LISA HALLOCK

*Florida Fish and Wildlife Conservation Commission
Florida Fish and Wildlife Research Institute, Charlotte Harbor Field Laboratory
1481 Market Circle, Unit 1
Port Charlotte, Florida 33953 USA*

ABSTRACT

An area off the southwest coast of Florida, known as Pulley Ridge, is composed of a unique habitat of corals, macroalgae, and other benthic organisms, along with an impressive diversity of fish species. In 2003, the Gulf of Mexico Fishery Management Council (GMFMC) voted to designate Pulley Ridge as a Habitat Area of Particular Concern (HAPC). Designation as a HAPC identifies the area as a unique habitat that deserves priority for conservation and management. Designation as a HAPC can prohibit many fishing practices and other human activities that may potentially damage the bottom habitat. As new fishing regulations may be required to protect the habitat, it is important to understand current and past fishing efforts and practices that have occurred in this area, as well as the importance of the area to fishers' livelihoods. Fishers gain a great amount of knowledge of a particular area through their acquired experience and observation. Short interviews with commercial fishers were conducted to shed more light on the uniqueness and importance of Pulley Ridge. This paper discusses the commercial fishery inside Pulley Ridge and anecdotal information from fishers to support and enhance scientific research. Incorporating fishers' knowledge with researchers' findings is important in thoroughly understanding and protecting unique habitats such as Pulley Ridge.

KEY WORDS: Pulley Ridge, commercial fishery, HAPC

Pulley Ridge - Un Nuevo Descubrimiento para los Científicos y un Viejo Descubrimiento para los Pescadores

El área cercana a la costa suroeste de la Florida conocida como Pulley Ridge está compuesta por un hábitat particular de corales, macroalgas y otros organismos bénticos, junto con una diversidad impresionante de especies de peces. En el año 2003, el Concejo de Manejo de las Pesquerías en el Golfo de México (*Gulf of Mexico Fishery Management Council*) designó por votación a Pulley Ridge como un Área de Hábitat de Preocupación Especial (*Habitat Area of Particular Concern*, HAPC). Esta designación identifica a la zona como un hábitat único que merece prioridad en la conservación y el manejo. Esta designación puede prohibir muchas prácticas de pesca y otras actividades humanas que potencialmente pueden dañar al hábitat del fondo. Dado que es posible que se requieran en el futuro nuevas regulaciones para la protección del hábitat, es importante entender las actividades y prácticas de pesca, tanto pasadas como presentes, que han ocurrido en esta área, así como la importancia de la zona para el sostén de los pescadores. Los pescadores obtienen una gran cantidad de conocimiento de un área en particular por medio de sus experiencias y de sus observaciones. Para este estudio se llevaron a cabo entrevistas con pescadores comerciales con el fin de obtener más información acerca de la calidad única y de la importancia de Pulley Ridge. Este artículo discute la pesca comercial dentro del Pulley Ridge y provee información anecdótica proveniente de los pescadores que apoya y mejora a la investigación científica. La incorporación del conocimiento de los pescadores a las observaciones de los investigadores es importante para obtener un conocimiento a fondo y para la protección de hábitats especiales como Pulley Ridge.

PALABRAS CLAVES: Pulley Ridge, pesca comercial, HAPC

INTRODUCTION

Pulley Ridge is an area off of the west Florida continental shelf edge. It is a North-South running tract of bottom that is approximately 157 km long and 50 km wide. The area is a rectangular shape that lies between 24°40' north latitude and 26°05' north latitude. The eastern boundary is 83°30' west longitude and the western boundary is 84°00' west longitude (Figure 1). United States Geological Survey (USGS) oceanographers, scientists from the University of South Florida, and scientists from other organizations have been studying this area, particularly the unique habitat of the southern portion,

since 1999. The southern portion of Pulley Ridge "supports a diverse modern benthic assemblage dominated by *Agaricia* spp. coral (multiple species), large (up to 20 cm in length) leafy clusters of the green algae *Anadyomene menziesii*, and coralline red algae. Less common stony corals include *Montastrea cavernosa* (in platy habit) and *Porites* spp." (Jarrett *et al.* 2000). Scientists observed up to 60% live coral cover in 60 - 75 meters of water in the southern portion of Pulley Ridge (Jarrett *et al.* 2005). The scientists have labeled the southern area as possibly the deepest hermatypic coral reef in the United States. In addition to the unique benthic habitat, the fishes of Pulley Ridge include commercially important species such as

Epinephelus morio (red grouper), *Mycteroperca phenax* (scamp), and *Lutjanus campechanus* (red snapper).

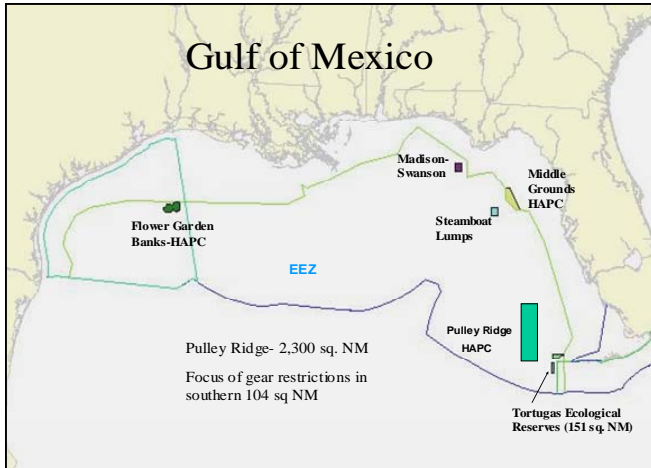


Figure 1. Location of Pulley Ridge, as well as other marine protected areas in the Gulf of Mexico. Map is redrawn and relabeled, but based on a GMFMC document (2004 provided to the council and the public for public hearings).

In a section of the Magnuson-Stevens Fishery Management and Conservation Act, essential fish habitat conservation is encouraged and potential impacts of commercial fishing gear on the habitat must be addressed. (M-S Act, section 303 (a) (7)). The “discovery” of Pulley Ridge prompted the GMFMC to quickly designate 2300 sq. nautical miles of gulf bottom as a HAPC, with gear restrictions in the southern portion (103.8 sq. nautical miles) that supports depths ranging from approximately 62 to 82 meters. The National Marine Fisheries Service (NMFS) published a proposed rule in the Federal Register (70 FR 56157, September 26, 2005) that proposes fishing gear restrictions in the southern portion of the Pulley Ridge HAPC to protect the live coral cover that was mapped by the scientists. Measures to protect the coral include prohibiting bottom anchoring and prohibiting the use of trawling gear, bottom longlines, buoy gear, and all traps or pots. These proposed fishing rules would primarily impact the commercial grouper fishery, a bottom-fishery, as there are very limited reports of trawling in the area, according to grouper fishers. It is unknown to what extent lobster traps are used in the area, although one grouper fisher reported that he “tries to avoid the heart of the hambone ridge since it is usually covered in lobster traps during season”. (According to fishers, Hambone Ridge is inside Pulley Ridge and runs north/south with east/west ridges from 25°00’ north latitude to 25°50’ north latitude at depths of 71 - 91 meters). Buoy gear is infrequently used and in the past two years (2003 and 2004), no data showed that the gear was used to capture grouper species, according to the Florida Fish and Wildlife Conservation Commissions’ (FWC) marine fisheries trip tickets. In addition, although vertical gear is not listed as a prohibited gear,

most vertical gear fishers anchor on the fishing bottom, thus they would have to drift fish inside the southern portion of Pulley Ridge. Drift fishing is not always feasible due to such variables as strong tides, winds, and the desire to remain stationary on a small section of hard bottom.

Over a ten-year period, numerous at-sea observation trips (including one bandit trip inside Pulley Ridge), photographs, videotape, and dockside sampling for the NMFS-based Trip Interview Program (TIP) were helpful in gaining an understanding of the commercial grouper fishery. In light of the recent discovery of Pulley Ridge, oral interviews with grouper fishers were conducted to specifically assess their knowledge of the new HAPC. For many years, fishers have been referring to the area known as Pulley Ridge by a variety of different names. For example, the area that contains the green algae, *Anadyomene menziesii*, was named the “cabbage patch bottom.” It is a very well known area to the fishers as it is the only area where they describe “catching” green algae on their hooks. One fisher described trips where he would be “knee-deep” in the algae on the back deck of his longline vessel. Further areas along the ridge to the north, but still within the HAPC, are referred to as Hambone Ridge, followed by Christmas Ridge, which begins near the northern boundary of the HAPC. These are all names and areas that fishers consider as “common knowledge” bottom. In addition to interviewing the fishers about the bottom habitat, the interviewer hoped to gain a better understanding of the fishing pressures and efforts inside Pulley Ridge, in order to supplement the inadequate state and federal data collected for “area fished” (based on Florida trip tickets, fishers’ logbooks, and TIP data). The statistical grids that define an area are much too large to actually pinpoint the location of a fishers’ trip. In federal waters, the grids cover an area from north to south that encompasses 60 nautical miles. For example, the area between 25° north latitude and 26° north latitude is assigned as NMFS statistical area 3. In addition, the entire Pulley Ridge HAPC is located in three different statistical grids, NMFS statistical areas 2,3,and 4. The southern portion of Pulley Ridge, with the proposed gear restrictions, is located in statistical area 2.

PULLEY RIDGE INTERVIEW METHODS

Oral interviews were conducted with thirteen reef fish fishers beginning in January 2005, to assess their knowledge of Pulley Ridge. The fishers were assigned a numerical identification for confidentiality reasons. The approximate age of the fisher, the number of years of fishing experience, the vessel home port, and the primary gear type that the fisher employed was recorded. In addition, the data was perceived on a scale from “Excellent” to “Poor” based on the authors’ perception of the reliability of the data. The perception of data quality is based on working with the same fishers through the years, collecting data for the TIP program. The interviews were flexible in hopes of receiving unique information, to allow

the fisher to spontaneously provide information on a variety of Gulf of Mexico habitat issues, and to create a comfortable conversation. Interviews were conducted in a variety of settings; ranging from interviews at the dockside, to restaurants, and/or the fishers' home. Multiple phone and e-mail correspondence with fishers occurred as well.

All fishers that were interviewed were presented with three large nautical charts to review: Waterproof Chart #35/ South Florida Maxi/ International Sailing Supply, Waterproof Chart #04/Caribbean Sea and Gulf of Mexico/ International Sailing Supply, and National Oceanic and Atmospheric Administration (NOAA) Provisional Chart #11006/ Key West to the Mississippi River. The fishers were shown the location of the entire area of Pulley Ridge. They were also shown the area in the southern portion of Pulley Ridge that may receive regulations to minimize interference with bottom impacting gear. In addition, the fishers were notified that the information collected was for a project for a University of South Florida graduate class, the Evolution and Ecology of Reefs.

RESULTS

A Brief Description of Grouper Fishing in Pulley Ridge

Commercial fishers participating in the grouper fishery in Pulley Ridge primarily rely on three types of gear to harvest fish: bottom longlines, vertical line gear (e.g. bandit rig and hook and line) and fish traps. Fish traps will be phased out and no longer used after February 2007. There is also talk about limited entry programs and a possible vessel buy-back program in the future, thus the number of participants will most likely be further reduced. According to the GMFMC, based on logbook data, the number of boats fishing with vertical gear in NMFS Statistical Area 2 was 127 boats in 2000 and 65 boats in 2003. Fish trap boats have declined from 9 boats to 4 boats during the same years, and the number of longline boats fishing in the area averaged 29 vessels (GMFMC 2005). Longline trips are typically 10 to 15 days at sea, bandit trips are typically five to eight days at sea, and fish trap trips are typically 5-10 days at sea, based on interviews for the TIP program. Annual grouper landings data from the Florida trip tickets were compiled for the years 2003 and 2004 in an effort to determine the amount of current bottom fishing pressure inside the southern portion of Pulley Ridge (Figures 2 and 3).

The most important shallow-water groupers to the fishers in the entire area of Pulley Ridge are *Epinephelus morio* (red grouper), *Mycteroperca microlepis* (gag grouper), *Mycteroperca bonaci* (black grouper), and *Mycteroperca phenax* (scamp).

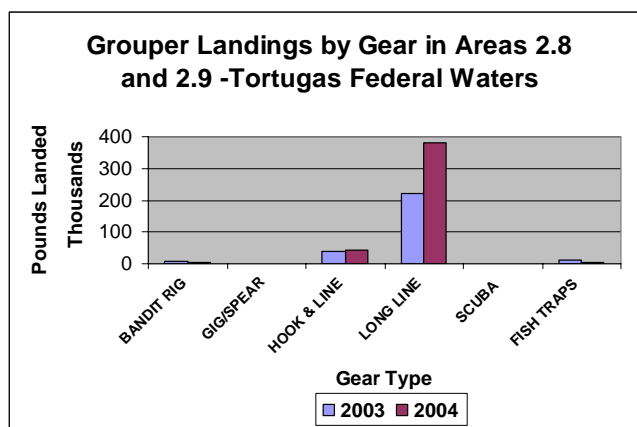


Figure 2. Grouper (all species) landings by gear.

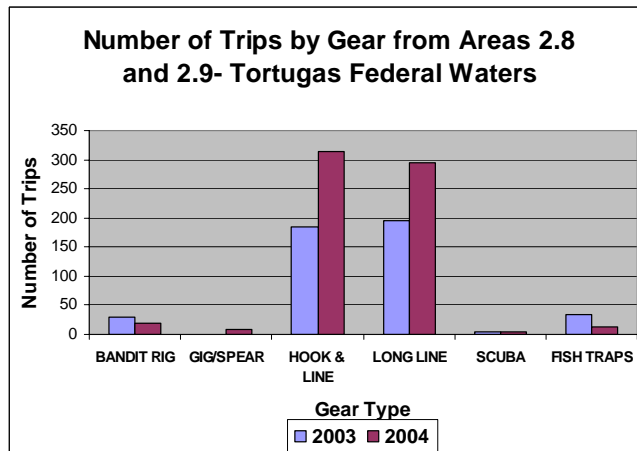


Figure 3. Number of grouper (all species) trips by gear type.

Pulley Ridge Oral Interviews

All fishers were highly cooperative and it appeared that they were interested in sharing their knowledge. Naturally, fishers that are easier to get along with were first on the list to interview, thus cooperation rate was high. It is interesting to note that cooperation was highest with two fishers that no longer fish. One of the fishers was born in 1926 and fished for approximately sixty years, while the other fisher fished for approximately fifteen years and is currently employed in the trucking industry. Both fishers did not hesitate to name spawning areas or locations of corals and other bottom habitat, probably as they no longer have a vested interest in the fishery. Although only thirteen fishers were interviewed, there are many more fishers in the Gulf of Mexico who would be willing to share their knowledge with scientists. Four fishers said that they did not fish in the lower portion of Pulley Ridge as it was too far from their home port, however, they had other interesting comments about grouper fishing. This

was a preliminary sample of interviews to determine if further interviewing would be beneficial and to learn how to interview properly and to focus on the subject. In addition, some interviews were extremely time consuming and were multi-day interviews. A longer period of time is necessary to interview fishers properly and to increase the sample size. In addition, it would be beneficial to interview fishers located near Key West, as that is the closest port to the southern portion of Pulley Ridge.

When fishers provided comments concerning areas of the Gulf, notations were marked in pencil on the charts and on additional paper. It was interesting to note that the naming of locations and the coordinates were fairly consistent with the fishers. For example, all fishers were very familiar with the Cabbage Patch Bottom and Ham-bone Ridge. It appeared that the fishers mapped out the bottom of the Gulf of Mexico and could describe how to get somewhere based on landmarks such as wrecks or bottom that is common knowledge. Fishers' comments were summarized in a narrative form. Thus, in keeping with the length limitations of this paper, only a sample of the comments is included (Appendix 1). Comments strayed considerably from the original intention to focus on Pulley Ridge. An attempt to gain an idea of the fishing pressure and importance of the area to fishers was unsuccessful for the most part. Comments such as "fifty percent of the grouper are caught south of 26°00' north latitude", "more than 100,000 miles of longline gear have been criss-crossed all over the Pulley Ridge area" and "fifty percent of the Madeira Beach longliners fish in the Pulley Ridge area" are difficult to quantify in a tangible means. The general conclusion is that this is a very important and productive area to fishers, but the conclusion is qualitative, rather than quantitative. Perhaps the interviews were too flexible and questions need to be posed such as, "How many days per year do you spend fishing inside Pulley Ridge?" The interview needs to be modified and perhaps less flexible to achieve the desired results. However, the additional information obtained from the flexible interviews could potentially be important and was interesting, nonetheless. For example, some comments involved the possible location of *Mycteroperca microlepis* (gag grouper) spawning areas and another fisher showed the area on the charts where he "catches zig-zag coral" on his hooks (zig-zag coral = *Oculina tenella Pourtales*).

Another concern with the interviews involves interview bias. Many of the fishers wanted to know what the bottom looked like to the scientists and how many fish (and how big!) were present in the area. Hearing reports that the corals were healthy, many of the fishers asked why they needed gear restrictions. Fishers may exaggerate the quantity of gear they use in the area in an effort to "prove" that the corals remain healthy, even with high fishing pressure.

DISCUSSION

Oral interviews are preferable to written mail surveys because the response rate is high, although one can potentially reach a much larger audience through the mail. In addition, with oral interviews, large nautical charts can be reviewed, the interview is flexible, and one can be certain that the fisher is interviewed and not the vessel owner. The majority of the longline vessels in the Gulf of Mexico are not owner-operated, and there are many owners that own "fleets" of vessels. Mail surveys would end up in the permit holders' mailbox (the vessel owner), and many of the fishers would be left out. Also, it is worth noting that there is at least one fisher in the survey who is illiterate, and an oral interview allows the fisher to participate in the survey. It is known that fishers notoriously dislike paperwork as well, thus oral interviews are the preferred method of information exchange.

In a fish habitat study performed in the New England area, social scientists found that "focus group" meetings were the best technique to gather habitat information from fishers, as opposed to a written questionnaire. In the study, fishers were asked to mark nautical charts to "identify habitats, including juvenile areas, spawning areas, and bottom features." It is also note-worthy to mention that in this study, it was suggested that a "framework for using and managing data" needed to be developed so that fishers' local knowledge could be of use to fisheries managers (Pederson and Hall-Arber 1999). This is the same problem faced with collecting local knowledge from fishers in the Gulf Of Mexico. Integrating the knowledge into scientific literature and finding consistencies and useful information in the data is very challenging.

Scientists do not spend enough time communicating with commercial fishers. Often, fishers' observations are considered "anecdotal" and dismissed. Also, commercial fishers have their own language; in describing the gear, the naming of fish, and the naming of areas, for example. This may cause confusion and communication difficulties if one is new to the subject. Fishers are also skeptical of scientists as well. However, fishers usually want to "speak their minds" and they want someone to listen to them. Eventually, many fishers will speak honestly and openly.

Scientists spent many years and large amounts of money mapping Pulley Ridge using multibeam bathymetry, submersibles, and remotely operated vehicles with expensive cameras. The "discovery" of Pulley Ridge was a large undertaking for the scientists, whereas the fishers have viewed the "cabbage" and other habitat on their hooks for over fifty years. It is necessary to bridge the gap between scientists and fishers to preserve our resources and for all of us to increase our understanding of the marine world.

LITERATURE CITED

- GMFMC (Gulf of Mexico Fisheries Management Council). 2004. Public Hearing Draft. Generic Amendment Number 3 for Addressing Essential Fish Habitat Requirements, Habitat Areas of Particular Concern, and Adverse Effects of Fishing. Gulf of Mexico Fishery Management Council, Tampa, Florida USA.
- GMFMC (Gulf of Mexico Fisheries Management Council). March 2005. Final Generic Amendment Number 3 for Addressing Essential Fish Habitat Requirements, Habitats of Particular Concern, and Adverse Effects of Fishing in Fishery Management Plans of the Gulf of Mexico. Gulf of Mexico Fishery Management Council, Tampa, Florida USA.
- Jarrett, B.D., A.C. Hine, A.C. Neumann, D. Narr, S. Locker, and W. Jaap. *Eos Trans. AGU*, 81 (48), Fall Meet. Suppl., Abstract OS21C-24, 2000. Deep Biostromes at Pulley Ridge; Southwest Florida Carbonate Platform.
- Jarrett, B.D. *et al.* 2005. Strange bedfellows—a deep-water hermatypic coral reef superimposed on a drowned barrier island; southern Pulley Ridge, SW Florida platform margin. *Marine Geology* **214**:295-307.
- Pederson, J., and M. Hall-Arber. 1999. Fish Habitat: A Focus on New England Fishermen's Perspectives. *American Fisheries Society Symposium* **22**:188-211.

Appendix 1. Comments from Fishers. Comments are paraphrased. Comments in quotations are direct quotes. [Comments surrounded by brackets and italicized are comments from the author.]

Cabbage Patch [*Anadyomene menziessi*] bottom is located just below the 25°00' north latitude and goes out to the west to about 83°45' west longitude.

In 88 fathoms, near 25°53' north latitude and 84°18' west longitude, the bottom is "peaky" and supposedly one can catch queen snappers in this area. This area is unique and the captain is hesitant to share his knowledge of the area with scientists because he stated that it could become a no fishing area. [*I fished in this area and we caught yellow-edge grouper, snowy grouper, red porgy, and speckled hind- June 2001, bandit gear*]

Email re: Pulley Ridge: "This whole debacle over the gear restrictions in areas designated to have coral is ridiculous. First, there is no official designation of what constitutes coral. Is it live coral, dead coral, and how big a piece of coral designates "coral". Secondly, the gear restrictions are going to be very difficult to enforce. The bottom is in pristine condition even after having interaction with fishers for over 50 years. All this is in result of a lawsuit, once more, management through litigation."

The Hatcher Wreck is located in 40 fathoms near 25°31' north latitude and W 83°34' west longitude.

There's no bottom for reef fish fishing in the low 30's [30-35 fathoms] area for a long stretch running north/south. The captain pointed to the area close to 26°00' north latitude.

The fisher started fishing in the Pulley Ridge area in 1978 and continues to fish in the same area today.

50% of the Madeira Beach longliners fish in the Pulley Ridge area.

Pulley Ridge is a very productive fishing area.

The "flat bottom" [*an unproductive fishing area*] runs from north/south in the mid 30-fathom depths. The captain pointed to the area near 25°20' north latitude up to 25°35' north latitude on the chart.

Cabbage Patch bottom is in depths out to 42 fathoms, and 47 fathoms in one spot.

Christmas Ridge runs north/south from the 26°05' north latitude (or 26°10') to 26°37' north latitude in the late 30's to early 40's [fathoms]. Christmas Ridge received its name because there were many fishers who had great trips in this area and earned large paychecks prior to the holidays.

*There are big ridges near 25°20' north latitude to 25°30' north latitude in the early 40's [fathoms].

The Steamboat Lumps MPA is not quite in the correct area to protect the spawning grouper.

Sawtooth Edge is an area at the southern end of Hambone Ridge. If you run the boat west to east, you will find different ridges to fish on. At the end of Christmas Ridge, Sawtooth Edge begins. Sawtooth Edge runs almost along the 40-fathom break and runs up to about 26°55' north latitude.

The "Ferns" refers to something on the bottom that looks like a fern. It is very fragile and brittle when it dries out. It falls apart easily, but one can hook many "ferns" in the area near 27°55' near the 40-fathom break. [*I have seen these ferns on the boats many times, but I do not know what they are*].

There's bottom that holds sponge that the fish spit up and it looks like tapioca pudding. So, the fisher calls it Tapioca sponge. This sponge is located in a certain area and if the fish are spitting it up, it's a good sign that the fishing will be good. American red snappers, silk snappers, and speckled hinds like eating this sponge.

On the charts near the 25 fathom circle, there is a lump, but the fisher didn't catch much there. [*This circle is located just to the north of the 25°00' north latitude and 83°00' west longitude. It is the same "lump" that caught the eye of the Pulley Ridge scientists and led to the first explorations of the area.*]

The zig-zag coral [*identified via photograph by Walt Jaap, as *Oculina tenella* Pourtales, 1871, a gulf endemic species*] is found in the good silk snapper bottom near the 25 line in 70-90 fathoms. Silk snapper are found just inside the 100 fathom line.

South Pulley Ridge is a good area for anchoring in bad weather. The anchor would hold on the hard bottom in 30 mph+ winds. It was also safe because you didn't have to worry about ships in that area.

"Stuff growing on the bottom changes with latitude."

The fisher believes that there was a large spawning aggregation of gag grouper in approximately February 1992 at approximately 26°22' north latitude and 83°38 or 83°39 west longitude along the 40-fathom break. He had his career best trip at this time and caught approximately 5,000 pounds of gag grouper in two days. He set his gear over a 4-mile stretch of bottom in 2-mile sections at a time. He would retrieve his gear and reset it back on the same exact spot, over and over for two days. The catch consisted of very large "rusty-belly gags" [*large male gag grouper that display a different color pattern*]. He returned to this spot in future years and usually did well, but not as well as in 1992.