

NOAA Gray's Reef National Marine Sanctuary Acoustic Fish Tagging Project

Activity: Interpretation of Data and Graphs – Grades 6-8

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Teachers copy

Use the available graphs or online sources to answer the following questions. The table and graphs are real data collected by scientists at Gray's Reef National Marine Sanctuary.

More information on the particular acoustic tagging project at Gray's Reef can be found at the Gray's Reef Website:

(http://graysreef.noaa.gov/science/research/fish_tagging/welcome.html)

and NOAA's FishWatch website (<http://www.nmfs.noaa.gov/fishwatch/>).

** Please note that scamp grouper cannot be found on Wikipedia. General fish information for scamp can be found at http://scaquarium.org/SSI/PDFS/fact_sheets/scamp.pdf or at the South Atlantic Fisheries Management Council (SAFMC) at <http://www.safmc.net/>. Both sites can be found through Google search engine.

1. The three species of fish used in the acoustic tagging student at Gray's Reef National Marine Sanctuary are *Lutjanus campechanus*, *Mycteroperca microlepis*, and *Mycteroperca phenax*. What are the common names of these fish?

Mycteroperca microlepis— Gag

Mycteroperca phenax—Scamp

Lutjanus campechanus—Red snapper

2. How old can these fish get?

Gag— 30 years old

Scamp— 30 years old

Red snapper— for 50 or more years

3. How big can these fish get?

Gag— up to 145 cm (4.75 ft or 57 in)

Scamp— up to 106 cm (3.5 ft or 40.2 in)

Red snapper— 100 cm (3.31 ft or 39.7 in)

4. Are the fish captured at Gray's Reef close to the maximum size that their species can reach?

Gag— No, it is not even half way there

Scamp— Close, about 20 cm away.

Red snapper— No, a little over half way there.

5. How old do these fish have to be to be able to reproduce?

Gag— males 8 years old while females are 5-6 years old

Scamp— Females at age 1, or about when they are 12 inches long.

Red snapper— they can reproduce when they reach 16 inches in length, which takes about 3 to 4 years.

6. Where are these fish found?

Gag— western Atlantic Ocean from North Carolina (US) south to the Yucatan Peninsula (Mexico). There have also been some reports of gag grouper occurring off the coasts of Bermuda, Cuba, and eastern Brazil.

Scamp— the western Atlantic Ocean from North Carolina to Key West, in the Gulf of Mexico and the southern portion of the Caribbean Sea.

Red snapper— the western Atlantic Ocean from North Carolina to Florida, and into the Gulf of Mexico.

7. What type of habitat do the fish prefer? How deep can the water be?

Gag can be found in brackish to marine environments. Juveniles are usually found along the shore in seagrass beds, while adults are off shore over hard bottom habitats in water that can be as deep as 152 m (500 ft).

Scamp— Juveniles often are found in estuaries along the shore, while adults are found over hard bottom habitat in water that is between 100 to 300 m (300 ft to 984 ft) deep.

Red snapper— Juveniles stay over sandy bottom surfaces, while adults stay close to rocky bottoms, ledges, artificial reefs, etc. They can be found in water ranging from 10m to 100 m (30 ft to 300 ft) deep.

8. Scamp and gag are considered to be protogynous hermaphrodites. What does this mean?

Protogynous hermaphrodites are animals that are born female and can become male at a particular age or size. This transition only occurs when the population is in need of males and scientists are just beginning to understand the triggers that may cause it.

9. Between "Sergio Snapper" the red snapper (49899) and "Rare Treat" the gag (49895), which can we determine to be a year-round resident?

"Rare Treat" the gag (49895)

10. About how long is the other fish (not the answer in Question 9) a resident in the reef?

"Sergio Snapper" the red snapper (49899) has been detected for about 7 or 8 months (Middle of October 08 to the beginning of May 09). It may be a resident for longer but outside of our detection range.

11. Which fish stayed at receiver 101951-52 the longest? Which stayed at receiver 101949-50 the shortest?

"Rare Treat" the gag (49895) stayed at receiver 101951-52 the longest.

"Sergio Snapper" the red snapper (49899) stayed at receiver 101949-50 the shortest, but neither was there very long. Remember that it's not just how many detections in one day, but also the amount of days.

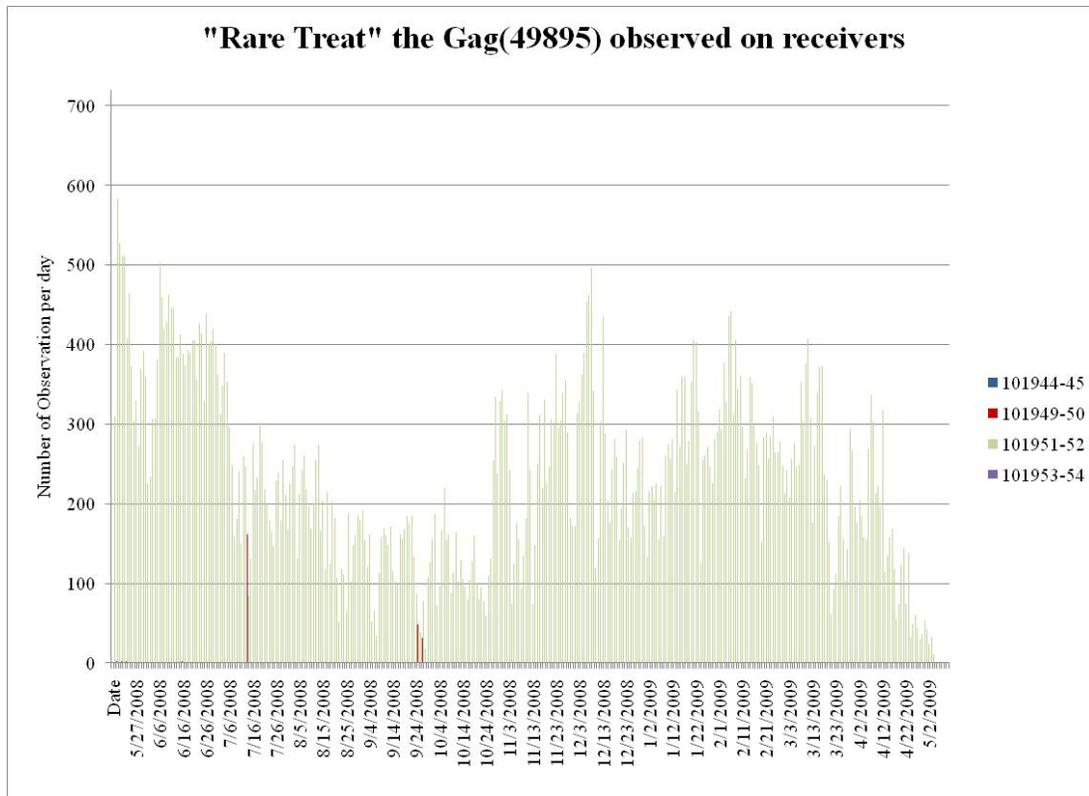
12. The gag grouper can be detected 720 times per day. On the day with the most detections what was its % detection and on the day with least detections (not including zero) what was its % detection.

The most number of detections in one day was 583 with an 81% detection rate and the lowest amount of detections was 1 with a 0.138% detection rate. The small red peak in early May of 2008 may be hard for students to see. The next lowest amount of detections was 14 with a 1.94% detection rate. My calculations were done using the numerical data used to make the graph. Students' answers will be a rough estimate of the real data.

Date Tagged	Species	Name	Forklength (cm)	Transmitter number	Date Released
5/14/2008	<i>Mycteroperca phenax</i>	Killer Grouper	58	49898	5/15/2008
5/14/2008	<i>Mycteroperca phenax</i>	--	85.5	49903	5/15/2008
5/15/2008	<i>Mycteroperca phenax</i>	--	84	49901	5/16/2008
5/17/2008	<i>Mycteroperca phenax</i>	Snappy Striper	74	49894	5/18/2008
5/17/2008	<i>Mycteroperca microlepis</i>	Rare Treat	63	49895	5/18/2008
5/17/2008	<i>Mycteroperca phenax</i>	--	75	49896	5/18/2008
5/18/2008	<i>Mycteroperca phenax</i>	--	83	49897	5/19/2008
5/18/2008	<i>Lutjanus campechanus</i>	Sergio Snapper	59	49899	5/19/2008

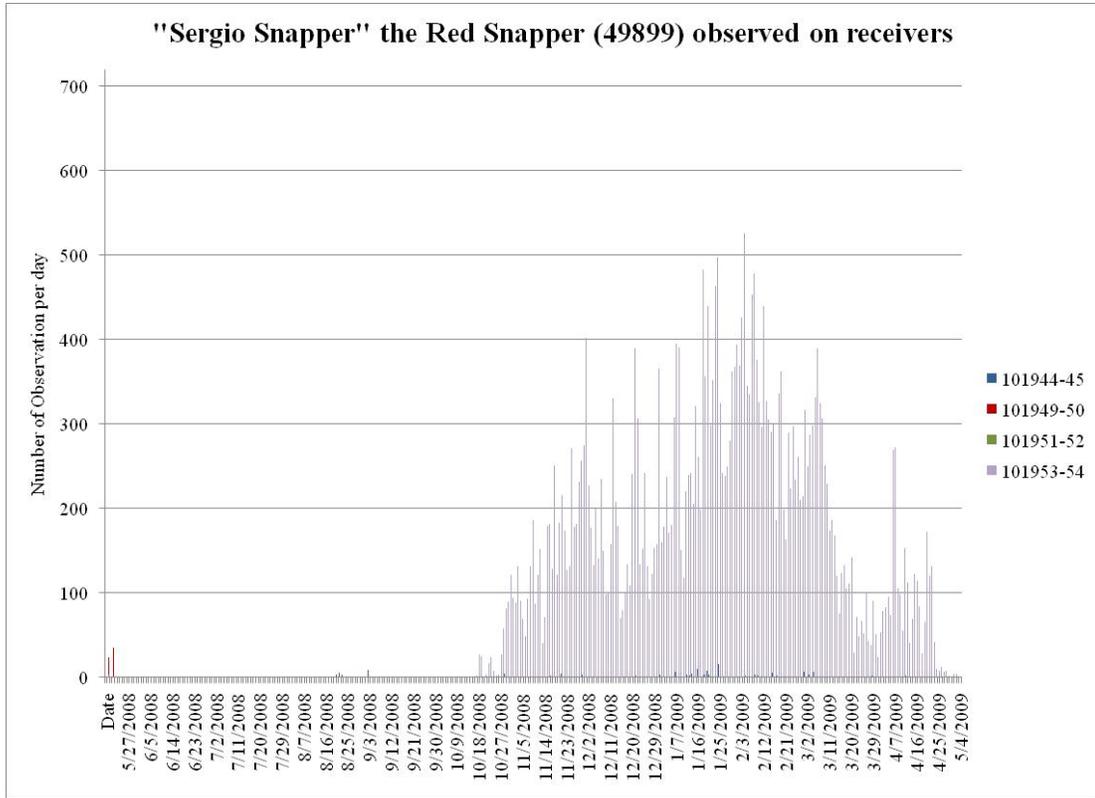
Fish Captured and Tagged by Gray's Reef in May 2008

These fish have been monitored by the deployed receivers to determine if they are present or absent in the detection area of the receivers. The following two graphs are the number of times a fish has been detected by a receiver per day. Detection is when a tag is in the range of a receiver and its signal has been picked up and recorded. Detections can be made from as far as 200 meters away from the receiver. As you can see, some fish can be detected 500 or more times a day. All graphs have a scale of 720 detections on the y-axis because the transmitters will send about 720 "pings" in one day.



["Rare Treat" the Gag \(49895\) observed on receiver](#)

This graph represents present-absent data of a gag grouper in select areas of Gray's Reef National Marine Sanctuary. The numbers in the legend on the right side of a graph represent a receiver placed in the sanctuary. Each vertical bar is a single day of the year and it is the number of times the gag was detected around that receiver (match the colors to the numbers on the right). As you can see the gag was mostly detected on receiver number 101951-52, and was picked up a few times on receiver 101949-50.



["Sergio Snapper" the Red Snapper \(49899\) observed on receivers](#)

This graph represents present-absent data of a red snapper in select areas of Gray's Reef National Marine Sanctuary. The numbers in the legend on the right side of a graph represent a receiver placed in the sanctuary. Each vertical bar is a single day of the year and it is the number of times the red snapper was detected around that receiver (match the colors to the numbers on the right).