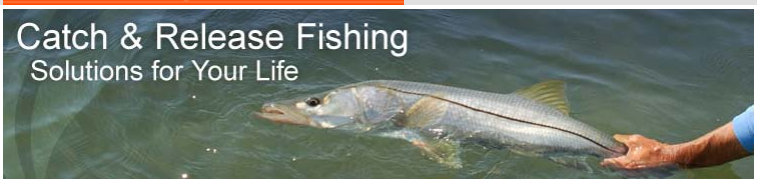
University of Florida



Resources & Materials for Educators

We are placing all our information here should you wish to download and make a presentation on catch-and-release fishing to a local group. Please credit the providing agency or organization.

Printed Materials

Please credit the providing agency or organization.

Catch-and-Release:
Things You Can Do to Help Saltwater Fish Survive

Four-panel, front-and-back brochure, measuring 16"×9", co-produced by Florida Sea Grant and the Florida Fish and Wildlife Conservation Commission. May 2008.

- View Online [475KB pdf]
- Right click to download hi-resolution PDF [4.5MB zip]

Venting: A Guide to
Releasing Reef Fish with Ruptured Swimbladders

Four-panel, front-and-back brochure, measuring 14"×8.5", produced by Florida Sea Grant. January 2005. In revision.

- View Online [720KB pdf]

Circle Hooks

Front-back sheet measuring 8.5"×11", produced by Florida Sea Grant. June 2008.

- View Online [296KB pdf]
- *Los Anzuelos Circulares*: View Online [36KB pdf]

Frequently Asked Questions

- New Regulations Requiring Circle Hooks, Dehooking Devices, and Venting Tools for Gulf of Mexico Reef Fish
  Four-page flyer, prints to 8.5"×11" sheet, or 4-pg booklet on tabloid paper. March 2008. [68KB pdf]
- Gulf of Mexico Red Snapper 2008 Management Measures
  Three pages, prints to 8.5"×11" sheet, or 4-pg booklet on tabloid paper. March 2008. [40KB pdf]
- New Regulations Requiring Circle Hooks, Dehooking Devices, and Venting Tools for Gulf of Mexico Reef Fish
  Based on federal FAQs, but with info specific to regulations in Florida State waters. Five

pages, prints to 8.5"×11" sheet. April 2008. [104KB pdf]

Photos

High-resolution image opens in a new window when thumbnail is clicked. Please credit the providing agency or organization.

FWC

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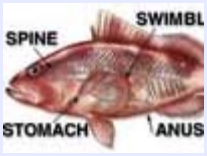
Ken Chambers



FSG

FSG

John Merriwether

PowerPoint

Watch Fish Venting: How to Use Venting to Improve Survival of Released Fish, a 12-minute PowerPoint-to-Flash tutorial covering the how and why of using venting and deep release rigs to mitigate the effects of barotrauma in reef fish.

Download Powerpoint presentation and script (9 Mb zipped file)

Videos

Please credit the providing agency or organization.

- Watch: Catch & Release
- Watch: Circle Hooks

- Watch: Dehooking
- Watch: Venting: A Tool for Managing Our Fisheries for Tomorrow

Florida Sea Grant

Visit our Web site for more information on our research and outreach investment in sustainable fisheries.

Partners

Florida Fish and Wildlife Conservation Commission NOAA Fisheries

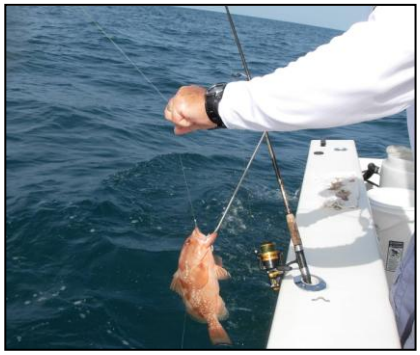
Related Video

Sustainable Fishing -- Living Green
University of Florida/WUFT-TV Series Measuring Saltwater Fish in Florida
Florida Fish and Wildlife Conservation Commission Deep Hooking in Tropical Fish
Australia's Recfishing Research Consortium Dealing with Barotrauma
Australia's Recfishing Research Consortium Releasing Snapper
Australia's Recfishing Research Consortium

Related Publications

2010 Recreational Fishing Regulations for GOM Federal Waters Catch-and-Release: Things You Can Do to Help Saltwater Fish Survive [475KB pdf] Circle Hooks Circle Hooks [296KB pdf] Circle Hook Magic [76KB pdf] Gulf of Mexico Red Snapper 2008 Management Measures - Frequently Asked Questions [40KB pdf] New Regulations Requiring Circle Hooks, Dehooking Devices, and Venting Tools for Gulf of Mexico Reef Fish - Frequently Asked Questions [68KB pdf] Release Techniques for Marine Fishes Venting: A Guide to Releasing Reef Fish with Ruptured Swimbladders

Benefit and Use of Dehooking Devices



Dehooking devices are an important conservation tool and help increase the chances that released fish survive.

Increased fishing pressure on coastal and pelagic fish species has prompted more stringent state and federal regulations which have lead to more undersized fish being released by recreational anglers. Although catch and release fishing is a valuable conservation tool in marine fisheries, the effectiveness of management is diminished if fish do not survive after being released.

Simply releasing a fish back in the water after it is caught does not guarantee a fish's survival; anglers must consider how their actions will affect the health and well being of their catch if they do not plan to keep it.

Where a fish is hooked, how it is handled before and during hook removal, and how long it is kept out of the water all play significant roles in the survivability of a fish once it is released.

A dehooking tool, or dehooker, is a simple device that fishermen of all ages can use to greatly increase the chances that released fish survive. It should become part of every fisherman's gear.

Why do catch and release fish die?

A fish that is caught and landed has just been in a battle for its life. It is usually exhausted, especially if it has struggled for a long time during capture, and will suffer from a number of physical and chemical stresses, including a buildup of excessive amounts of lactic acid in its blood and muscle tissue. The stress of capture may be great enough to cause death -- even if the fish appears unharmed when released, it may later die. Released fish mortality is usually associated with two factors:

- Mortality associated with hooking, including the location and depth of the hook, or excessive bleeding
- Mortality associated with physiological stress caused by capture and landing, subsequent handling by the fisherman, hook removal, time out of water, barotrauma, or release.

Dehooking tools can help minimize the trauma and stress that fish suffer from many of these factors.

Dehooking Tools are Better for the Fish... and the Fisherman

The use of a dehooking tool to removed embedded hooks can help alleviate some of the stresses and physical damage associated with catching and handling a fish. They are also used to remove hooks from sea turtles and other marine life. In addition, they help protect the angler from sharp hooks, pines, and teeth.

There are several types, styles and manufacturers of dehooking devices available on the market today. Although costs vary, an angler can expect to pay on average between $8 and $20. Some tools have been more extensively field tested by researchers and industry than others and meet NOAA fisheries minimal design standards. Pliers and forceps are often used as dehooking devices, but dehooking devices that can grab the fishing line, slide down the line, and remove the hook quickly are recommended because they require minimal to no handling of fish and better secure the hook during removal.

**Dehooking tools come in a variety of shapes and sizes, and can be found in any store that sells fishing gear. Here is just a small sample of the kinds available today. Use the appropriate size for the hook you are removing and the fish you have caught.*

**The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication do not signify our approval to the exclusion of other products of suitable composition.*

Excess handling of fish especially with dry hands or towel can negatively impact fish by removing their protective slime layers, which protects them from disease and aides in movement. Dehooking devices allow anglers to remove terminal tackle with minimal to no handling.

Dehooking devices allow anglers to keep fish in the water while removing the hook, thus reducing the amount of time exposed to air.

Furthermore, anglers using dehooking devices are generally able to keep a fish in the water when removing terminal tackle , thus minimizing the amount of time of air exposure to the fish. Even short periods of air exposure can cause elevated stress levels in fish. Studies on rainbow trout (Ferguson and Tufts, 1992) and rock bass (Cooke, et al. 2001) indicated 30 seconds of air exposure resulted in two full hours of cardiac recovery for their perspective fish.

Another benefit of dehooking devices is they help minimize injury and excess bleeding by quickly and safely removing hooks. Most devices are also designed to reduce the risks of hooks re-engaging once they are removed, thus preventing further injury to the fish.

Some dehooking devices are specifically designed to remove deeply swallowed hooks in addition to external lip or foul hooks. Instructions for removing deeply swallowed hooks may differ slightly from tools that only remove external hooks. Consult with the manufacturer and/or salesperson for instructions.

If you gut hook a fish and do not have a dehooking device that can properly remove deeply swallowed hooks or are not comfortable using one, cut the leader as close to the hook as possible. The hook will eventually rust out and/or the fish will be able to expel it. A general rule of thumb is if you cannot see the hook in the fish's mouth, you should cut the leader.

Using a dehooking tool

Using a dehooking device is a relatively simple process even for novice anglers including children, but may require some practice to ensure it is done correctly. If you are not familiar with using a dehooking device, you can practice on a corrugated cardboard box before using it on a real fish. While there are variations on the use of different brands of dehooking devices, below is a general description of how to remove an external (lip or foul) hook from a fish using a long-handled dehooking device.

- Hold the leader in one hand and the dehooking tool in the other.
- Place the rod of the dehooking device on the leader like a bow and arrow and slide it towards yourself until the leader encounters the end of the dehooking tool.
- Slide the dehooking device down the leader until it engages the hook.
- Pull the leader and dehooking device apart with constant pressure.
- While keeping pressure on the leader and dehooking device, lower the leader while raising the dehooking tool. A slight twist of the dehooking tool may be needed to release the fish *(The weight of the fish will help remove the hook)*.

Even beginning anglers can use dehooking devices with relative ease. Consider practicing on a cardboard box before using it on a real fish.

New Gulf of Mexico Reef Gear Regulations

Effective June 1, 2008 state and federal regulations in the Gulf of Mexico require commercial and recreational fishermen to have on board and use dehooking devices when targeting reef fish. Dehooking devices must be:

- Constructed to allow the hook to be secured and the barb shielded without re-engaging during the removal process
- Blunt and all edges rounded
- Appropriate to secure the range of hook sizes and styles used in the reef fish fishery

The Florida Fish and Wildlife Conservation Commission considers that reef fish species include all snappers, groupers, sea bass, amberjacks, gray triggerfish, hogfish, red porgy and golden tilefish.

Keep in Mind

- Regardless if you fish from a boat or land, a dehooking device will prove useful to quickly and efficiently release fish.
- Boat or wade fishing will make it easier for an angler to keep a fish in or near the water while removing the hook.
- Never dehook a fish in the boat or on dry land as this can increase the likelihood of injury when the fish is released.
- Fishing from a pier, bridge, seawall, or other high structure presents its own special challenge due to the distance between the angler and water, and the potential impact of releasing a fish from such a distance. Be sure to dehook the fish over the water to avoid the fish hitting any rocks, pilings, or other obstructions below.
- In either situation, the less time the fish is kept out of the water, the less stress it will endure.

Remember, quicker/ safer hook removal and release of fish = increased chance of survival!

The key to successfully using a dehooker is to pull the leader and dehooker apart with constant pressure, then lower the leader while raising the tool. Give the tool a slight twist if necessary, and let the weight of the fish do the rest.

Sources

Cooke, SJ; Philipp, DP; Dunmall, KM; Schreer, JF, 2001. The influence of terminal tackle on injury, handling time, and cardiac disturbance of rock bass. North American Journal of Fisheries Management. Vol. 21, no. 2, pp. 333-342.

Ferguson, R.A and B.L. Tufts. 1992. Physiological effects of brief air exposure in exhaustively exercised rainbow trout. Canadian Journal of Fisheries and Aquatic Sciences. Vol. 49, no. 6, pp. 1157-1162

Written by

Bryan Fluech
Collier County Sea Grant Extension Agent
fluech@ufl.edu
(239) 417-6310 x204

Betty Staugler
Charlotte County Sea Grant Extension Agent
staugler@ufl.edu
(941) 764-4340

Solutions for Your Life

Handling Fish Properly

By adopting just a few simple habits, recreational anglers can greatly increase the chances that the fish they catch and release will survive, meaning each and every saltwater angler can positively influence the future of Florida's fishing stocks by striving for 100 percent survival of released fish.

- Handle fish as little as possible and only with wet hands – never with a towel.
- It's best to take pictures of a fish being released while it is in the water.
- If a net is needed to remove a fish from the water, use a knotless net.

- It's okay to take a picture of a fish if it needs to be briefly taken out of the water to measure it, vent it or remove the hook, but support the weight of the fish horizontally and safely return it to the water as quickly as possible – no lengthy "poses" just to take a picture.
- If a fish must be lifted from the water, support its weight horizontally.

- Avoid lifting a fish by its jaw, especially large fish. This can injure the fish so it can't feed normally and/or harm its internal organs.
- If a hook is deep in a fish's throat or stomach, cut the line as close as possible to the hook – the hook will eventually dissolve inside the fish.

Captain Ken Chambers

De-hooking tools allow fishermen to easily and safely remove hooks while the fish remains in the water.

- If a fish is exhausted, revive it before releasing it by passing water over its gills – move it forward in the water with its mouth open.
- Gently release a fish head first into the water.
- Only gaff a fish when you're sure it's legal to harvest and you intend to keep it.
- Never hold a fish by its gill cover.
- Never put your hands or fingers in a fish's gills or eyes.
- Avoid lifting a fish from the water by the line.

A fish is too valuable to catch only once!

Florida is the "Fishing Capital of the World," largely because Florida carefully manages its valuable marine resources.

We often are required to release saltwater fish when we catch them to help maintain fish populations, and more and more anglers are practicing "catch-and-release" to do their part to preserve marine fisheries while they enjoy their outdoor fishing experiences.

For more information on catch-and-release fishing, proper fish handling techniques, and the new Gulf of Mexico reef fish requirements, contact these offices:

Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399-1600
www.MyFWC.com/marine
(850) 488-6058

Florida Sea Grant
PO Box 110409
Gainesville, FL 32611-0409
www.flseagrant.org
www.catchandrelease.org
(352) 392-1837

Unless otherwise noted, all photos provided by Florida Fish and Wildlife Conservation Commission

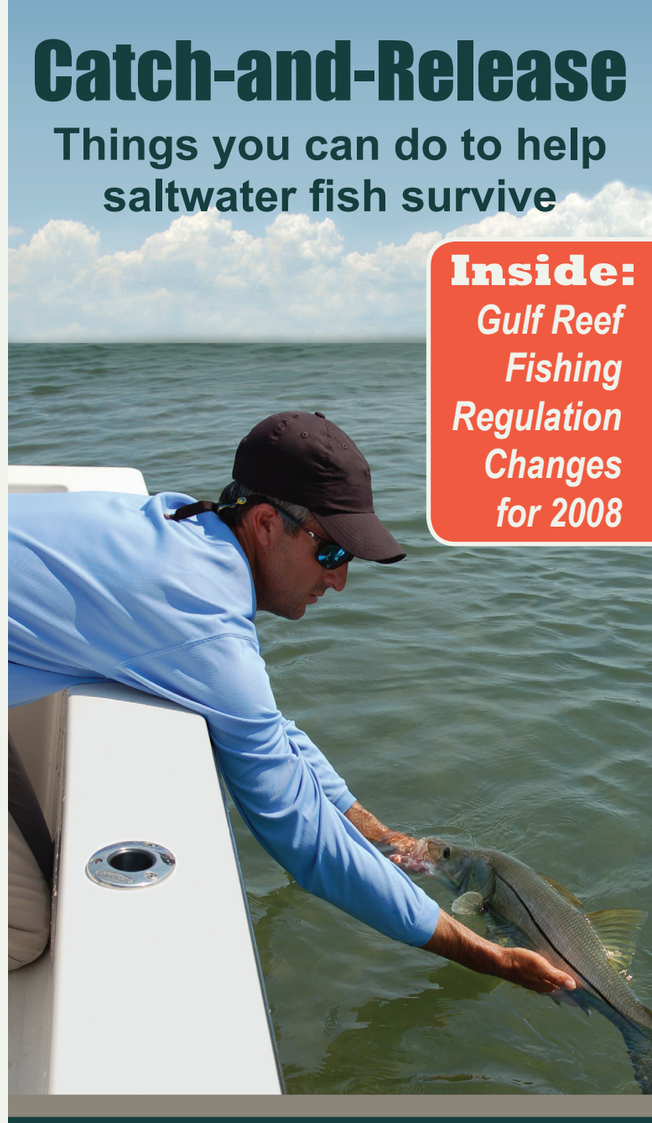
Cover photo by John Merriwether

SGEF 168 **May 2008**

Catch-and-Release

Things you can do to help saltwater fish survive

Inside:
Gulf Reef Fishing Regulation Changes for 2008



Releasing a fish safely and free of harm is key to helping it survive. This guide offers tips on how you can properly handle and release saltwater fish.

Ways to Help Fish Survive

Research has shown that you can significantly increase the survival rate of fish you catch with proper handling during the release.

Ethical anglers strive to save 100% of the fish they release.

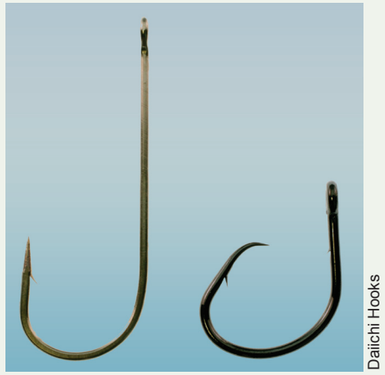
- Use tackle heavy enough to land a fish quickly to reduce exhaustion, which could result in its death or weaken it making it more vulnerable to predators.
- Release a fish while it's in the water whenever possible.
- Use a de-hooking device if needed to help remove hooks safely.
- Use non-stainless steel hooks – these hooks can dissolve if they remain in a fish.
- Use non-offset circle hooks when fishing with natural bait to avoid gut-hooking a fish – circle hooks tend to hook fish in the jaw, making them easy to remove.
- Bend barbs down on hooks so they can be removed with less damage to a fish.
- Use a venting tool if necessary to release pressure in a fish taken from deep water.

Special Requirements for Gulf of Mexico Reef Fish Anglers

Beginning June 1, 2008, a person onboard a vessel harvesting any species of reef fish in Gulf of Mexico waters must possess and use non-stainless steel circle hooks when fishing with natural baits, a dehooking device and a venting tool. Reef fish species include all snappers, groupers, sea bass, amberjacks, gray triggerfish, hogfish, red porgy and golden tilefish.

Circle Hooks

Circle hooks are fishing hooks made so that the point is turned perpendicular to the shank to form a circular or oval shape.



Daiichi Hooks

J Hook Circle Hook

If fishing for reef fish from a vessel in Florida Gulf state waters, the point of the circle hook used with natural bait cannot be offset from the shank.

Florida Sea Grant

Non-offset circle hook Offset circle hook

Research has found that circle hooks are more likely to hook fish in the mouth instead of in the esophagus or stomach, which reduces harm to the fish.

If you accidentally catch a Gulf reef fish on a J hook while using natural bait, you must release it.

Florida Sea Grant

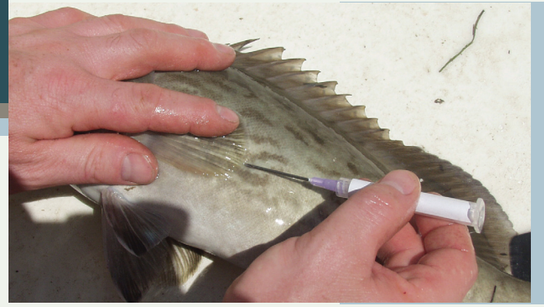
There is a wide variety of de-hooking tools available on the market today.

De-hooking

De-hooking tools, or dehookers, are instruments that allow the hook to be secured and the barb shielded without re-engaging when the hook is removed from a fish. It must be blunt, have rounded edges and be of a size appropriate to secure the range of hook sizes and styles used in the Gulf reef fish fishery.

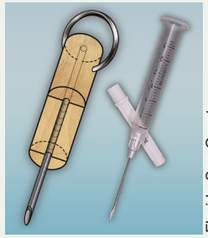
Dehookers come in a variety of shapes and sizes; use the tool that works best for the fish you are releasing.

If a fish swallows the hook, it may be better to cut the line as close as possible to the hook instead of trying to remove the hook.



Venting helps release gases that may over-expand in the body cavity when fish are brought to surface from deep water.

Venting



Florida Sea Grant

Venting tools are sharpened, hollow instruments such as a hypodermic syringe with the plunger removed or a 16-gauge needle fixed to a hollow wooden dowel. Larger gauge needles may be harmful to the fish. A tool such as a knife or ice-pick is not allowed.

Reef fish taken from depths of 50 feet or more may undergo expansion of the gases in the swim bladder as they are brought to the surface. Signs of this condition are protrusion of the stomach from its mouth, bulging eyes and a bloated belly. Proper use of a venting tool will help the fish survive by allowing it to safely return to the bottom.

Deflation of a bloated Gulf reef fish must be done with the venting tool by inserting the needle into the body cavity at a 45-degree angle under a scale in an area approximately 1 to 2 inches behind the base of the pectoral fin just deep enough to release the trapped gas and to release the fish with minimum damage.

If the stomach is protruding from the mouth, don't puncture it or try to put it back into the mouth. It will return to its normal location following the release of a properly vented fish.

Gulf Breeze Guide Service

Gulf Breeze Guide Service

Gulf Breeze Guide Service

Fishing laws are designed to maintain a desirable spawning stock size to ensure adequate future recruitment of juvenile fish. Compliance with fishing laws is essential for sustaining U.S. sport and commercial fisheries. When compliance means releasing a fish, follow these guidelines to improve its survival.

FISH SURVIVAL GUIDELINES

- Have a plan for releasing a fish before landing it. Because time is crucial in keeping a released fish alive, work quickly and in concert with others on board for quick releases.
- Avoid using gaffs and landing nets if possible.
- Handle the fish as little as possible and try to minimize its time out of the water.
- Handle the fish with wet hands, wet gloves or a wet towel to avoid removing beneficial fish slime, and avoid damaging the gills and eyes.
- Use a hook removal device or pliers to back out hooks with minimal damage to the fish. For deep-hooked or throat-hooked fish, cut the leader as close to the hook as possible. Use hooks which rapidly degrade in saltwater.
- Revive an exhausted fish in the water by passing water over its gills, using a gentle back-and-forth swimming motion until the fish recovers.

The fish venting information provided here is based on the best available research regarding reef fish venting as interpreted by a Florida Sea Grant advisory panel. This research was conducted in cooperation with scientists in the Fish Biology Program at the Center for Fisheries Enhancement, Mote Marine Laboratory.

RICH NOVAK

Florida Sea Grant recognizes the contribution to fisheries conservation made by Richard L. "Rich" Novak, one of the state's foremost advocates of effective angler involvement in sustainable fisheries. Rich had more than 20 years of Sea Grant extension experience and had served as the Florida Sea Grant marine agent in Charlotte County from 1997 until his untimely death in 2004. He was a leader in the development and promotion of the fish venting tool and other catch-and-release techniques that reduce fish mortality.

For more information on fish venting or marine release techniques, contact your local Florida Sea Grant marine extension agent.

Sea Grant
Florida

Science Serving Florida's Coast
Florida Sea Grant College Program
University of Florida, P.O. Box 110409
Gainesville, FL 32611-0409
www.flseagrant.org

SGEF-162

January 2005

Venting

A Guide to Releasing Reef Fish with Ruptured Swimbladders

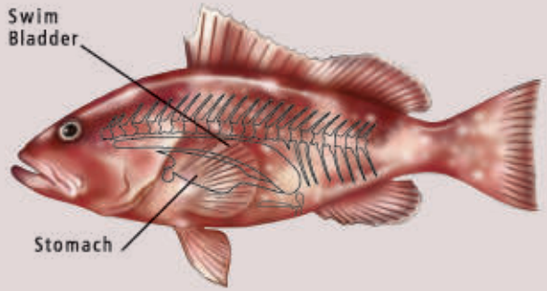
Sea Grant
Florida

THE PROBLEM

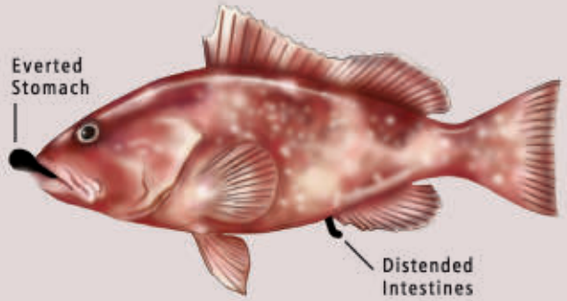
Many marine reef fish have a gas-filled organ called a swimbladder, which controls buoyancy and allows the fish to maintain a certain depth in the water column. The gas in the swimbladder can over-expand when fish are brought quickly to the surface by hook and line. This can result in serious injury to the fish, and if released in this buoyant condition, the fish may float away and die from exposure to the elements or become an easy target for predators. This defeats the purpose of fishery management laws such as minimum size restrictions and daily bag limits.

SWIMBLADDER BIOLOGY

Many reef fish have a closed swimbladder, an internal organ filled with gases, mostly oxygen, carbon dioxide, and nitrogen. This organ is located in the peritoneal cavity attached to the fish's backbone beneath the dorsal fin.



Swimbladders can expand only so far before they burst. When the swimbladder bursts, the swimbladder gases escape into the fish's body cavity, where they can continue to expand. The pressure exerted by these gases is sufficient to push the stomach out the mouth and the intestines out of the anus.



Venting releases these gases from the body cavity, thus eliminating the pressure on the internal organs. If damage is not excessive, the organs will return in place on their own, once the gases are expelled. Venting also will allow the fish to overcome buoyancy problems and swim down to habitat depth, enhancing its immediate survival.

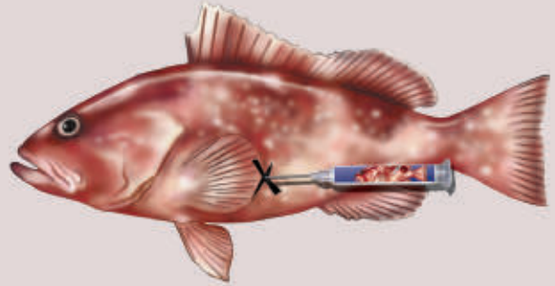
Scientific studies have shown that species with closed swimbladders such as red grouper, black sea bass, gag, and red snapper derive immediate benefit from venting.

DETERMINING WHICH FISH TO VENT

The ability to judge which fish should be vented improves with practice and experience. After reeling in a fish, closely observe its condition. If the fish is bloated and floats (is unable to control its buoyancy) or if the fish's stomach is distended out of the mouth, the fish should be vented. If the fish appears normal, not bloated, and is able to swim down to habitat depth on its own, venting is not necessary.

VENTING PROCEDURE

Vent the fish with a minimum of handling. If the fish's stomach is everted out of its mouth, do not puncture it or attempt to push it back into the fish's body. Expelling the swimbladder gases using the following procedure will allow the stomach to return to its normal position within a few hours.

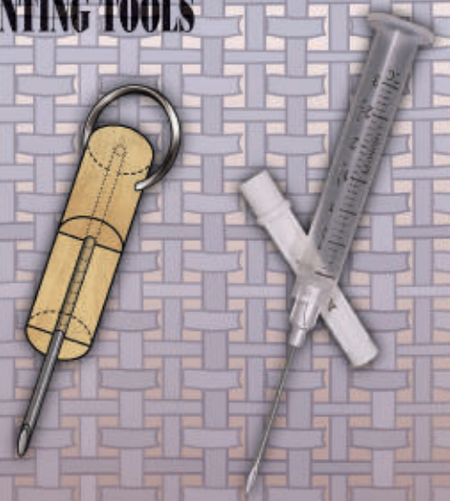


Hold the fish gently but firmly on its side and insert the venting tool at a 45-degree angle approximately one to two inches back from the base of the pectoral fin. Only insert the tool deep enough to release the gases — do not skewer the fish. The sound of the escaping gas is audible and deflation is noticeable. If a fish is extremely bloated, use the hand holding the fish to exert gentle pressure on the fish's abdomen to aid deflation.

Keep a good grip on the venting tool during the entire process, so that an unexpected jerk from the fish does not dislodge the tool and cause injury to others. The fish's everted stomach should not be punctured. This practice is not efficient in releasing gas from the body cavity and results in additional injury.

Return the fish to the water as soon as possible. If necessary, revive it by holding the fish with the head pointed downward and moving the fish back and forth to pass water over the gills until the fish is able to swim unassisted.

VENTING TOOLS



A venting tool can be any hollow, sharpened instrument that allows gases to escape. Ice picks and knives are not suitable because simply puncturing the fish is undesirable and can result in a mortal injury.

The Sea Grant/Novak Venting Tool, designed and developed by Florida Sea Grant in cooperation with Mote Marine Laboratory, can be purchased from Aquatic Release Conservation, Inc., online at www.dehooker4ARC.com, or by calling its toll-free number, 1-877-411-4272. Florida Sea Grant is not aware of any other commercial suppliers of venting tools.

A venting tool can be created out of a hypodermic syringe with the plunger removed, such as the one pictured above. A 16-gauge needle (cannula) is recommended on a 3-cc syringe as a handy size. A cannula cemented into a hollow wooden dowel also works as a venting tool. Cannulas and syringes can generally be purchased at farm supply stores.

Chlorine bleach is a good disinfectant to use when cleaning the venting tool between uses. Use a syringe cap or place a cork on the tip of the tool after use to prevent personal injury.

Cooperative Extension Service
R. Glenn Thomas, Ph.D.
Associate Professor Fisheries
School of Renewable Natural Resources
Room 227 RNR Bldg., LSU
Phone: 225.578.0771 Fax: 225. 578.4227
Baton Rouge, LA 70803
gthomas@agctr.lsu.edu
Web site: www.lsuagcenter.com

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Lagniappe
Sea Grant LOUISIANA
May 1, 2008 Volume 32, No. 5

The Red Snapper Issue

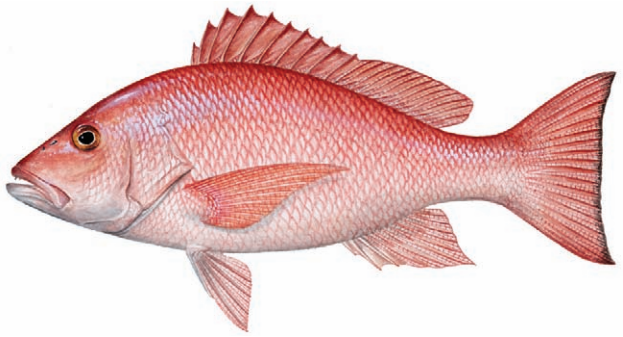

Photo credit: Diane Rome Peebles. Courtesy Florida Fish and Wildlife Commission and the artist.

Recent developments in the management of red snapper in the Gulf of Mexico (particularly recreational fishing; see last month's issue for background *www.seagrantfish.lsu.edu/pdfs/lagniappe/2008/04-01-2008.pdf*) have produced escalating levels of controversy. In order to provide readers with a sound base of information, most of this issue will be devoted to this topic, and a couple of renowned experts have been asked to contribute. The larger questions addressed now (briefly) will be:

Who regulates red snapper (and other Gulf fisheries)?
How much is known about the biology of red snapper?
How are red Snapper stock assessments performed?

Who Regulates Red Snapper and other Gulf fisheries?

In Louisiana, marine fisheries are regulated by the state (out to 3 nautical miles, nm) and by the federal government within the exclusive economic zone (EEZ: from 3 to 200 nm). Since red snapper are a relatively deep-water fish, nearly all come from federal waters off Louisiana. In nearly every instance, Louisiana state regulations mirror the federal ones, as they have historically, to make enforcement simpler and fairer. The recent actions in Texas and Florida to establish more liberal red snapper regulations within their sate waters has generated a firestorm of controversy – in particular, because of those states' 9-nm boundaries. However troubling these actions are, it should be noted that the 9-nm boundaries in Texas and the Gulf waters of Florida were created under the conditions that existed when those states were admitted to the Union.

The Magnuson-Stevens Act

The principle law governing fisheries in federal waters is the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) of 1976. The original intent was to establish authority over the EEZ to eliminate harvests by foreign fishing fleets. While conservation of fish stocks was another goal, the MSFCMA also provided for significant expansion of U.S. offshore fishing capability. The result was, within 10 years, an over-capacity in the domestic fleet similar to that previously occurring from the foreign fleets.

The MSFCMA also created a management structure based on regional fishery management councils, with voting members that include the state marine fisheries directors, individuals from each state who are knowledgeable about fishing or conservation and the regional NOAA Fisheries director. The councils receive advice from their appointed advisory panels and stock assessment panels, and from scientific, statistical and management committees. The councils are tasked with the production of fishery management plans (FMPs) that must protect resources while maintaining opportunities for commercial and recreational harvests. Plan implementation is the responsibility of the Secretary of Commerce, primarily via NOAA Fisheries Service. Thus, the Fisheries Service is faced with the unenviable task of applying the legal mandates of Congress (the MSFCMA) and the Gulf Council (the FMPs).

In 1996, the MSFCMA was reauthorized by Congress as the Sustainable Fisheries Act (SFA), with the addition of new, specific mandates. FMPs must conform to 10 national standards, including these that are most significant in red snapper management:

Standard 1: Conservation and management measures must prevent overfishing while producing ongoing optimum yield from each fishery,
Standard 2: Conservation and management measures must be based on the best scientific information available,
Standard 3: Individual stocks must be managed as a unit throughout their range to the extent practicable; interrelated stocks must be managed as a unit or in close coordination,
Standard 4: Management measures cannot discriminate between residents of different states; allocations of privileges must be fair and equitable,
Standard 8: Measures must be consistent with conservation requirements and must include consideration of the importance of fishing resources to fishing communities to provide for sustained participation and minimize adverse economic impacts,
Standard 9: Management must minimize bycatch or mortality from bycatch.

The SFA further established requirements that each FMP include a definition of overfishing and a plan for rebuilding overfished stocks (overfishing must be stopped within two years and a plan must be developed to rebuild overfished fisheries within 10 years). The SFA defines overfishing as excess removal of fish and overfished as a biomass level that has declined below the established threshold.

The latest reauthorization of the MSFCMA in January 2007 included major new mandates, including that FMPs must establish a mechanism for setting annual catch limits that prevent overfishing. Catch limits also must be in place by 2010 for every stock currently overfished.

Beginning Red Snapper Regulations

The first Gulf reef fish (including red snapper) FMP was completed in 1981, and described a declining fishery for red snapper. A 13-inch minimum size limit was the first Gulf regulation, in 1984. Since then, there have been more than 35 federal management measures on red snapper in the Gulf.

In 1988, the first red snapper stock assessment showed that the species was both overfished and undergoing overfishing. That designation required action from the Gulf Council and NOAA Fisheries to recover the stock. The assessment concluded that fishing mortality needed to be cut by 75 percent in order to recover the species by 2000. The Gulf Council believed that the impacts to fishers from a 75 percent cut would be too severe, and opted for measures that would reduce harvest by 20 percent, postponing additional restrictions for the future.

At least one early action established a criterion that remains. FMP Amendment 1 in 1990 set the recreational/commercial catch allocation at 49 percent/51 percent based on 1979-1987 landings data. This allocation ratio has not changed, although the directed fishery has changed significantly over the subsequent years.

The 1988 assessment also described the significant contribution to total fishing mortality that comes from shrimp trawling bycatch mortality of young red snapper. The first bycatch reduction device (BRD) mandate for Gulf shrimp trawls came in 1998; the hope was that about three-quarters of juvenile red snapper would escape each net. Since then, trials have demonstrated low efficacy (about 15 percent) in releasing juvenile red snapper via previously permitted designs. Temporary closures of certain juvenile habitat to trawling has been under consideration, but the recent reductions in trawling effort and implementation of new BRD designs have allowed postponement of closure considerations, at least temporarily.

Much more information on these topics can be found in:

Hood, P. B., A. J. Strelcheck, and P. Steele. 2007. A history of Red Snapper Management in the Gulf of Mexico. Pages 267-284 in W. F. Patterson, III, J. H. Cowan, Jr., G. R. Fitzhugh, and D. L. Nieland, editors. Red snapper ecology and fisheries in the U.S. Gulf of Mexico. American Fisheries Society, Symposium 60, Bethesda, Maryland.

The Magnuson-Stevens Fishery Conservation and Management Act: Reauthorization Issues. Congressional Research Service, February 7, 2005. E. H. Buck. *http://digital.library.unt.edu/govdocs/crs/permalink/meta-crs-10098:1*

The Magnuson-Stevens Fishery Management and Conservation Act of 1996 *http://www.nmfs.noaa.gov/sfa/magact/*

The Magnuson-Stevens Fishery Management and Conservation Act of 2007 *http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/MSA07.pdf*

How much is Known about the Biology of Red Snapper?

Age and Growth

Age of most marine fishes (except sharks and rays) is estimated from examinations of the otoliths (earbones) that are located beneath the brain and function much like the human inner ear (balance and detection of vibrations). After cutting a thin cross-section from the center of the otolith, inspection under a microscope reveals concentric dark growth rings that are akin to the growth rings seen in trees. One ring equals one year of life.

As little as 20 years ago, red snapper from the Gulf of Mexico (GOM) were thought to live only about 10-15 years; we now know them to be significantly long-lived compared to many familiar marine fishes. Spotted seatrout (specks) in Louisiana seldom survive past age 5, tunas are old at age 12, and redfish may live about 40 years at the maximum. The oldest red snapper reported in the scientific literature is an individual sampled in February 1991. This specimen, a female 53.6 years of age at time of capture, was actually hatched before World War II and survived to “see” the dawn of the atomic age, the first man on the moon and the technological boom of the late 20th century. However, an even older specimen, almost 59 years of age, was sampled from the commercial harvest by LSU biologists some years later. Such old individuals have been rarely encountered in the various research projects that have sampled either the commercial harvest or the recreational harvest; they have become even increasingly more uncommon in the last decade or so. The vast majority of the red snapper harvested by the two fisheries are in the range of 2-6 years of age.

Young Zachary Aucoin caught this 30-lb snapper in 2004. The fish was 19-years-old, and was spawned during the year of the fisrt Gulf red snapper fishery management plan.

Red snapper grow in length relatively fast during their first 10 years or so of life and reach, on average, a length of about 30 inches. Growth rate decreases drastically thereafter as they shift more energy into reproduction and less energy into growth. This growth strategy also allows them to get big quickly, an advantage in both avoiding and deterring predators. However, there is great variety in individual growth rates among red snapper; size is little indication of age. For instance, a 5 year old red snapper may range in length from as little as 13 inches to as many as 32 inches, and a 32-inch-long specimen may range from 5 to 50-plus years of age. Interestingly, old individuals are seldom very large and large individuals are seldom very old. The 53.6 year old female referenced above was a mere 33.5 inches long and weighed only 17.5 pounds. Conversely, the world angling record red snapper (caught in the GOM off Louisiana by Doc Kennedy of Grand Isle on June 23, 1996) was 41 inches long and weighed 50.25 pounds, yet was only 20 years old!

Spawning and fecundity

The red snapper spawning season in the northern Gulf of Mexico begins in May and ends in late September (about 120 days); peak spawning months appear to be May, June and July. Almost all female red snappers in the GOM off Alabama become spawning-capable (reproductively mature) at age 2 and at a total length of about 13 inches. In the GOM off Louisiana, however, while many females become spawning capable at age 2, some female red snappers do not start spawning until they are age 5 and almost 27 inches in length. This is likely due to differences in population sizes between the two areas (fewer red snapper off Alabama).

Red snappers, like many other marine fish species, are batch (or serial) spawners. This means they are capable of repeatedly spawning batches of eggs every few days over the course of the entire spawning season, a strategy that allows them to produce and spawn many times more eggs than if they only spawned a single time per season. The number of eggs spawned in each batch varies with the size of the individual and can be as few as a 1,000 for a small female to as many as 2.5 million for a large, healthy female. Given that the average time between successive spawning is four days, female red snappers will spawn about 30 times (some more, some fewer) during the spawning season. This means that even a small red snapper will produce a seemingly respectable 30,000 eggs in a season while a large female might spawn an incredible 75 million or more eggs! And if it should survive to the known maximum of its longevity, a female could potentially spawn nearly 4 billion eggs in her lifetime. Naturally, with all these red snapper eggs being spawned, it must be incredibly difficult to survive from egg to spawning adult or the GOM would be wall to wall red snappers!

Habitat

Red snapper are pelagic spawners, that is, the males and females simultaneously release their eggs and sperm up in the water column and allow the fertilization of the eggs to the whims of the ocean. The eggs hatch after about a day and the larvae are dispersed by the currents and tides of the GOM. After a month or two of feeding, growing, and being carried by the currents, the young red snapper take up residence on low-relief, inshore or offshore, sand or mud habitats where they will spend the

next year or two. It is while inhabiting these areas that they are most susceptible to being caught in shrimp trawls.

Shortly before they reach 2 years of age, most red snappers move to areas of cover and high relief such as natural and artificial reefs, shipwrecks and especially oil platforms, where these structures afford both food and protection from predators. Surprisingly, little of their food comes directly from the structure itself; rather they forage at night for shrimps, worms and crabs that live on the seabed as much as several hundred yards away from the structure. While resident on these structures, red snapper are quite safe from the shrimp nets, but they become vulnerable to both commercial and recreational fishermen. It is thought by some that, after several (5-10) years of residency on either reefs or rigs, red snapper migrate away from these structures to remote, more isolated habitats in the deeper waters of the GOM.

Movements and population structure

The red snapper in the GOM is currently managed under the “unit stock hypothesis;” this generally implies that there is both a great deal of long-distance movement by individuals and little genetic difference among individuals and populations throughout the GOM. Management of red snapper under the unit stock hypothesis also has the advantage of simplicity in both the application and enforcement of regulations. Tagging studies (in which fish are caught, tagged, released and hopefully re-caught at a later time) have shown that red snapper are indeed capable of movements as much as 350 miles, especially when motivated to do so by tropical storms and hurricanes. However, in these same studies, the vast majority of tagged red snappers are recaptured within a few miles of their initial tagging sites even after several years of post-tagging freedom. Genetic studies analyzing both nuclear DNA and mitochondrial DNA have generally been unable to refute the unit stock theory; however, they have shown that there are minor, yet very consistent, differences in the genetic makeup of red snapper populations across the GOM. Also certain demographic differences, such as the variations in ages/lengths at maturity in Alabama and Louisiana red snappers, indicate that local populations of red snapper are largely isolated from neighboring populations.

All of the above suggest that red snapper in the GOM may indeed have become structured into a series of semi-isolated, largely independent populations that perhaps should be managed as its own unit stock. Application of region-specific regulations (quotas, minimum sizes, daily bag limits, etc.) in different areas of the GOM may be a more appropriate approach to management of the species, if not more complicated for management and enforcement personnel.

Release mortality

Minimum size regulations have been applied to both the recreational and the commercial red snapper fisheries since 1984. The purpose of minimum sizes was to increase the yield of the fisheries and to enhance the likelihood of female red snapper spawning at least once before being harvested. Both fisheries started with a 13 inch minimum, but over the years the minimum allowable length for harvest increased to 15 inches in the commercial fishery and 16 inches in the recreational fishery. Just recently the minimum size for the commercial fishery has reverted to 13 inches.

For years there have been anecdotal reports of great numbers of dead, discarded, undersized red snappers floating off from behind fishing boats, both commercial and recreational. The ascent from depth to the water’s surface often produces injury to hooked red snappers due to hydrostatically-induced barotrauma (eyes bulging, intestine protruding from anus, air bladder distended and stomach protruding from mouth, etc.). What are the probabilities of an undersized red snapper surviving catch and release?

Two studies, one off Texas and one off Louisiana, simulating techniques used in the red snapper recreational fishery have estimated mortality of regulatory discards to range between 1 percent and 44 percent and increasing with depth of capture. In the relatively shallow waters off Alabama, another study calculated a discard mortality of 13 percent for red snapper caught with recreational gear. Among red snapper less than 18 inches released from headboats in Texas waters, 15.2 percent floated off and 1.4 percent were discarded dead.

Given the gamut of life-threatening circumstances that a red snapper regulatory discard must face, it may not be unreasonable to expect a near 100 percent mortality of discards in the commercial fishery. In a study conducted on commercial fishing boats off Louisiana, 69 percent of undersized red snappers returned to the water were either near death (as evidenced by their failure to resubmerge) or dead. Additional mortality due to either fish or mammalian predators may occur on specimens that are trying, perhaps struggling, to return to depth. Should an individual survive the catch and release experience and should it avoid the various predators as it swims down, there is also the possibility of long-term mortality due to barotrauma-induced internal injuries. Additional studies are needed to determine the level of, as well as spatial and temporal patterns in, both short-term and long-term mortality of discarded red snapper.

- David Nieland

Sources:

Patterson, W. F., III, J. H. Cowan, Jr., G. R. Fitzhugh, and D. L. Nieland, editors. 2007. Red snapper ecology and fisheries in the U.S. Gulf of Mexico. American Fisheries Society, Symposium 60, Bethesda, Maryland. See particularly:

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Nieland, D. L., A. J. Fischer, M. S. Baker, Jr., and C. A. Wilson. 2007. Red snapper in the northern Gulf of Mexico: Age and size composition of the commercial harvest and mortality of regulatory discards. Pages 273–282.

Patterson, W. F. 2007. A review of movement in Gulf of Mexico red snapper: Implications for stock structure. Pages 245-261.

Wilson, C. A., and D. L. Nieland. 2001. Age and growth of red snapper Lutjanus campechanus from the northern Gulf of Mexico off Louisiana. Fishery Bulletin 99:653–664.

Woods, M. K. 2003. Demographic differences in reproductive biology of female red snapper (Lutjanus campechanus) in the northern Gulf of Mexico. Master's thesis. University of South Alabama, Mobile, Alabama.

How are Red Snapper Stock Assessments Performed?

Red snapper recreational and commercial landings data are accumulated each year. Because red snapper are managed as one large population in the Gulf of Mexico (GOM), these data are independent of where the fish were caught. Most fisheries scientists agree that NMFS does a thorough job of accounting for how regulations can affect catch rates and measures of catch-per-unit-effort are given a lot of weight in the assessment. Fishery independent (FI, not caught by the directed commercial and recreational fisheries) indices of abundance are used to "tune" the assessment so that the computer models provide the best fit to the landings data and do not produce trends in time that are inconsistent with the FI data. The FI indices are quite varied and include trawl surveys of juvenile red snappers, estimates of the abundances of red snapper larvae through time, etc, as indicators of trends in abundance. The effects of climate and market forces on red snapper populations are more difficult to deal with and are not significant components in the assessment models.

However, even the things scientists know well can generate uncertainties in assessment outcomes. For example, the assessment models are very sensitive to catch at age even though individual red snapper can be aged with great accurately. The problem is that once red snappers reach about 10-12 years old, their growth rates slow and more and more of their energy is devoted to spawning products (eggs and sperms), especially by females. So a fair sized red snapper may be between 10 and 50 years old and the biggest fishes are never the oldest.

Because it is impossible to age every fish that is caught, fish biologists have developed age-at-weight relationships based on thousands of otolith-aged red snapper, and probabilistically assign ages to fish in the catch based upon this relationship. This generates uncertainty, and there are many other variables where such uncertainties exist. To overcome this problem in the computer models, both the variables of interest are allowed to vary over ranges observed in nature and the models are run over and over again, usually as many as 500-1,000 times (called bootstrapping) until a set of models emerge which provide the best hindcast and fit to the historical landings and the FI indices of abundance. Strong year classes are accounted for even if we don't know the environmental conditions that produced them. Only model runs that fit both of these criteria are considered. Most of the time spent on assessments is devoted to this first step, since every subsequent calculation hinges on these calculations. This is the base model, and it is used to predict harvest rates over the next couple of years, which is all that stock assessment models were ever intended to do.

Computer models for predictions of long-term management objectives are also bootstrapped, but do not actually use the assessment models described above in the same way. What is done in this step is to take the best estimates of parameters from the base model and assume that these are fixed in time at their average value and do not vary, although runs are done with different levels of recruitment. This is called an equilibrium model that also is run thousands of times for each assessment. But what are varying now are management alternatives. A run might be made with high recruitment, 40 percent reduction in bycatch, two fish bag limit for recreational fishery, 15 inch size minimum for the recreational fishery, 13 inch minimum for the commercial fishery, seasonal closures, each fishery with its specific regulatory discard rate and discard mortality, etc. This is projected forward in time both to estimate a harvest rate and to determine if the management goal is reached by the year 2032.

The next run could be low recruitment, 50 percent reduction in bycatch, three fish bag limit and 20 inch minimum size for the recreational fishery, 14 inch minimum for commercial sector, slight changes in discards, shorter fishing season, etc. This is projected forward in time to estimate a harvest rate and to determine if the management goal is reached, and on and on. You can imagine the number of different combinations possible. This is done thousands of times and what is generated and presented to the Gulf of Mexico Fisheries Management Council is a set of management alternatives that produces catches that can achieve rebuilding, but with very different probabilities of reaching the 2032 management goal successfully.

The longevity (they may live almost 60 years) of red snapper enters the picture here because Congress (not NMFS) ruled in the Magnuson-Stevens Sustainable Fisheries Act (MS-SFA) that rebuilding has to occur within 1.5 generation times, which for red snapper is the year 2032 based upon current information about longevity. NMFS is constrained by law to do this, but they are sometimes as skeptical about these long-term predictions as are others. They have lessened the probability of drastic restrictions by using 5-year rebuilding plans as a measure to provide stability in the industry. So far this is working, but the 2007 reauthorization of the MS-SFA incorporates many concerns of environmental groups, so overfishing now must end on all fisheries in U.S. waters by 2010.

Recent research, such as Reanalyses of Gulf of Mexico fisheries data: Landings can be misleading in assessments of fisheries and fisheries ecosystems, by Kim de Mutsert, James Cowan Jr., Timothy E. Essington and Ray Hilborn (Proceedings of the National Academy of Sciences 2008) mitigates some of the gloom-and-doom predictions that were used as evidence by the environmental groups to convince Congress that most fisheries are collapsing — but the MS-SFA remains the law of the land.

The Gulf Council expects to see management alternatives with probabilities of success that range from 16 percent to 84 percent; this is presented as the allowable biological catch (ABC) range.

By law, the Gulf Council must pick a total allowable catch (TAC) from within this range. For the last 15 years, the it has picked TACs from the low probability end (with a much-less-than 50:50 chance of rebuilding the stock by 2032) of the ABC range. These alternatives all were based on a significant reduction in shrimp bycatch mortality; each year that shrimp bycatch remained high, the less likely it became that 9.12 million pound combined harvest levels could be sustained. Because it was possible, albeit improbable, that recovery could occur with the proposed regulations, a decision was postponed until the shrimp bycatch numbers had been fully resolved. When it became overwhelmingly obvious that a technological solution to shrimp bycatch was not possible for red snapper, no options other than major catch restrictions were feasible.

- Jim Cowan

FISHERIES SERVICE PROPOSES AMBERJACK AND GRAY TRIGGERFISH RULE

NOAA Fisheries Service seeks public comment on a proposed rule that would implement measures to end overfishing and rebuild greater amberjack and gray triggerfish in the Gulf of Mexico. The most recent assessments for these species indicate reductions in harvest are needed to end overfishing and allow the stocks to recover within each species' respective rebuilding schedule. For 2008, the overall harvest of greater amberjack needs to be reduced by 32 percent, and for gray triggerfish, reduced by at least 49 percent. To ensure these targets are met, the rule proposes annual catch limits (ACLs) and accountability measures (AMs) for these species. These measures are outlined in Amendment 30A to the Fishery Management Plan (FMP) for the Reef Fish Resources of the Gulf of Mexico (Amendment 30A) submitted by the Gulf of Mexico Fishery Management Council.

Proposed Management Measures

For greater amberjack, the proposed rule would:

- Establish ACLs and AMs that require inseason adjustments for the recreational and commercial sectors.
- Increase the recreational minimum size limit to 30 inches fork length (FL).
- Set the bag limit for captain(s) and crew of for-hire vessels at zero.
- Establish a greater amberjack commercial fishery quota of 0.503 million pounds (mp) and a recreational fishery quota of 1.368 mp.

For gray triggerfish, the proposed rule would:

- Establish gray triggerfish ACLs and AMs.
- Increase the gray triggerfish recreational and commercial minimum size limit to 14 inches FL.
- Establish a gray triggerfish commercial hard quota of 80,000 pounds for 2008, 93,000 pounds for 2009 and 106,000 pounds for 2010.

Accountability Measures and Annual Catch Limits

The proposed rule addresses requirements of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) that ACLs and AMs be in place by 2010 for stocks undergoing overfishing. ACLs and AMs work together as a management system to end and prevent overfishing. The ACL must be set ‘‘at a level such that overfishing does not occur in the fishery.”

Proposed AMs for both species give the NOAA Fisheries Service Assistant Administrator (AA) the authority to shorten the fishing season for a sector should landings go over the ACLs. For greater amberjack, the AA would have the authority to shorten the season within the fishing year and in the following year if ACLs are exceeded or are projected to be exceeded. For gray triggerfish, the recreational AM would provide the AA the authority to shorten the fishing year in the following year if the ACL is exceeded, while the commercial AM would give the AA the authority to shorten the fishing season within the fishing year and in the following year if the commercial ACL is exceeded. Gray triggerfish ACLs would be defined as multi-year running average landings, with exception of the first year which would use only 2008 landings.

All comments received by NOAA Fisheries Service specific to the proposed rule will be addressed in the final rule. To comment on these measures, your information must be received no later than 5 p.m., EST, on May 23, 2008. You may submit comments by any of the following methods:

Electronic Submissions: Federal e-Rulemaking Portal: *http://www.regulations.gov*. All comments received are part of the public record and will generally be posted to *http://www.regulations.gov* without change. All personal identifying information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information. NOAA Fisheries Service will accept anonymous comments. Attachments to electronic comments will be accepted in Microsoft Word, Excel, WordPerfect, or Adobe PDF file formats only.

Mail: Peter Hood, Southeast Regional Office, NOAA Fisheries Service, 263 13th Avenue South, St. Petersburg, Florida 33701. Fax: 727-824-5308, Attention: Peter Hood.

The proposed rule is also available via the Internet at: *http://www.gpoaccess.gov/fr/index.html* (do an advanced search under proposed rules for “page 19040”). Printed or electronic copies of the rule and Amendment 30B can be obtained from the Southeast Regional Office by contacting Peter Hood (see address above).

FEDERAL DATA REQUIREMENTS FOR CHARTER FISHING

NOAA Fisheries Service is working to improve the quality of information used in managing the fisheries resources of the Gulf of Mexico. Having appropriate and current data enables the Gulf of Mexico Fishery Management Council and NOAA Fisheries Service to carry out responsive and timely fisheries management.

Operators participating in the for-hire fishery are reminded that, if selected to report by the Southeast Fisheries Science Center (SEFSC) Director, they are required to supply fishing reports of their fishing trips to an authorized statistical reporting agent or send reports in the mail postmarked not later than seven days after the end of each month.

Recently, the SEFSC mailed selection letters to for-hire permit holders who operate headboats for Gulf of Mexico Coastal Migratory Pelagics and Gulf of Mexico Reef Fish. Operators selected to report to the headboat survey are required to report landings and effort data from all trips made. For each trip there must be an accurate record of the name and official number of the vessel; the operator's U.S. Coast Guard license number; the number of fish of each species taken; the estimated total weight of each species; the number of anglers aboard; the date(s), location and duration of fishing; number of anglers actually fishing; pay type of trip (charter vs. per-person); distance from shore; and condition of released fishes (released dead or released alive). Reporting is required for trips fishing in state waters as well as in the federal waters of the Exclusive Economic Zone. Accurate and timely reporting of logbooks in the headboat fishery is a requirement for obtaining and renewing charter vessel/headboat permits. The Magnuson-Stevens Fishery Conservation and Management Act provides penalties for violations of its regulations, including civil monetary penalties up to $130,000, permit penalties that include sanctions and revocation, and forfeitures of catch and vessels.

Contact Ken Brennan at the NOAA Fisheries Service Beaufort Laboratory, 252/728-8618 with questions about reporting. Questions about required permits should be referred to the NOAA Fisheries Southeast Region Permits Office at 727/824-5326, or go their Web site for more information: *http://sero.nmfs.noaa.gov/permits/permits.htm*

THE GUMBO POT

Ken's Crabocado Dip

This is a favorite developed by Ken Rust of Baton Rouge. Ken reports that some people don't care for the anchovies, but rather than provide a substitution in the recipe, he suggests that "they won't like this one".

Melt 1 stick butter, add 1.5 cans cream of mushroom soup, 1 tablespoon crushed black pepper, 4 dashes Tabasco, ½ teaspoon of thyme. Simmer 5 minutes. Add 1 pound crabmeat, lump or backfin. Add 1 cup evaporated milk, and juice of one large lemon. Stir gently and salt to taste.

Slice 2 avocados and line your baking dish with them. Pour the crab mixture on top.

Dice one can of anchovies very finely and mix them with a full cup of bread crumbs. Spread this on top of the casserole mixture, and punch topping down into the mixture with a spoon. Bake 15 minutes at 350. You may want to broil it for a minute at the end to brown the top a little. Serve with crackers.

If you hear anything whistling….its your arteries.

For more information, contact your local extension agent:

David Bourgeois – Area Agent (Fisheries)
Lafourche & Terrebonne Parishes
Phone: (985) 873-6495
E-mail: dbourgeois@agctr.lsu.edu

Thu Bui – Assistant Extension Agent, Fisheries
St. Mary, Iberia, and Vermilion Parishes
St. Mary Parish Court House
500 Main Street Rm. 314
Franklin, LA 70538-6199
Phone: (337) 828-4100, ext. 300
Fax: (337) 828-0616
TBui@agcenter.lsu.edu

Carol D. Franze – Associate Area Agent
Southeast Region
21549 Old Covington Hwy
Hammond, LA 70403
Phone: (985) 543-4129
Email: cfranze@agcenter.lsu.edu

Albert 'Rusty' Gaudé – Associate Area Agent (Fisheries)
Plaquemines, St. Bernard, and Orleans Parishes
Phone: (504) 682-0081 ext. 1242
E-mail: agaudet@agctr.lsu.edu

Thomas Hymel – Watershed Educator
Iberia, St. Martin, Lafayette, Vermilion,
St. Landry, & Avoyelles Parishes
Phone: (337) 276-5527
E-mail: thymel@agctr.lsu.edu

Kevin Savoie – Area Agent (Southwest Region)
Natural Resources-Fisheries
Phone: (337) 475-8812
E-mail: ksavoie@agctr.lsu.edu

Mark Schexnayder – Coastal Advisor (Fisheries)
St. John, St. Charles, Jefferson & parts of Orleans Parishes
Phone: (504) 838-1170
E-mail: mschexnayder@agctr.lsu.edu

Mark Shirley – Area Agent (Aquaculture & Coastal Resources)
Jefferson Davis, Vermilion, Acadia, St. Landry, Evangeline,
Cameron, Calcasieu, Lafayette, Beauregard, & Allen Parishes
Phone: (337) 898-4335
E-mail: mshirley@agctr.lsu.edu

Glenn Thomas – Associate Professor (Fisheries)
School of Renewable Natural Resources
Phone: (225) 578-0771
E-mail: gthomas@agctr.lsu.edu

For questions or comments about a story, contact Lagniappe editor Glenn Thomas at gthomas@agctr.lsu.edu.

The Solution To Reef Fish Barotrauma

Everyone who fishes in the Gulf of Mexico understands that some fish float when released. This is one of the biggest problems with catching reef fish such as Red Snapper, Grouper, Triggerfish and other saltwater species. It has long been known that most of the reef fish caught in deep water will not survive if they are too small or are caught out of season and have to be returned to the water. Some people say that dolphins stand in line, waiting on the fish to be released so they can eat them. Others anglers will tell you that they float fish behind the boat on a regular basis.

Working To Find A Solution To Help Floating Fish Survive

We are working with scientists trying to come up with a solution to help fish survive what is called barotrauma. Everyone knows that the water depth that a fish is caught has an effect on the fish. We are tirelessly working on a way to change the way we fish by using light tackle and fishing higher in the water column or at a lower Atmosphere to reduce the stress on the fish. We all know the solution is not to fish on the bottom for reef fish. That will never happen as long as everyone does not know how to help the fish survive barotrauma.

The Cause of Reef Fish Barotrauma or Fish To Sometimes Float When Released

Reef fish barotrauma is caused by two things. The first reason is the fish that are targeted are caught on the bottom of the gulf or deeper in the water column. The second thing that causes barotrauma is the reef fish are reeled up at a faster rate than they can adjust their swim bladder. The results are devistating to the fish if they were caught in depths greater than 3 atmospheres or 99 feet deep. The problem is greater if the fish are caught in dephts of over 200 feet or 5 atmospheres.

The solution is getting fish back down to a depth or atmosphere (ATM) where their air bladder restores itself to a natural pressure. For instance, if you catch a fish in less than 33 feet of water or 1 ATM, they are likely not to show any signs of barotrauma. If you catch a fish between 34 and 66 feet or 2ATM, the fish will suffer minor trauma, depending on the species. If you catch fish in

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2/13/2011

Spring Break in Gulf Shores and Orange Beach are looking promising. Bookings are up and people are **.....**

depths greater than 3 ATM or over 77 feet, there is 3 times the pressure on the fish than it is if caught in shallower water. The problem is not deep sea fishing. The problem is the way people fish and the depth that they fish. Most people fish too deep and do not understand Boyles Law.

Fish Descenders and How They Work

Mr. Bill Shelton of Newark, California is the inventor of the Shelton Fish Descender ™ that hooks to the fish and helps take them back down to a depth where the fish's air bladder naturally adjusts to the atmosphere that the fish came from. The secret to this invention is that it is key to getting fish back down below 33 feet or 1 atmosphere of pressure quickly or to the depth the fish came from. This can be whatever depth. The descender works and helps fish that are caught in lower or shallower waters such as 1 ATM, 2 ATM and 3 ATM. We do not know how it will work on fish that are caught in depths greater than 4 ATM or deeper. This is because of the damage done to the fish by the pressures created by retrieving them from deeper water.

We use the Shelton Fish Descender ™ exclusively in an effort to successfully release all of our fish species that have suffered from barotrauma back to a depth that will allow them to recover. We also fish higher in the water or less than one atmosphere or 33 feet in an effort to minimize the harm to the reef fish. If an angler does catch a fish on the bottom, we return that fish to its original depth to quickly stabilize the fish.

Deep Water Grouper and Barotrauma

The obvious problem for those of us fishing for deep water Grouper in atmospheres greater than 3ATM or about 100 feet. Most grouper live in 180 feet 5.5 ATM or 350 feet 10.6 ATM. The problem is when a deep water species such as Grouper being caught in atomospheres greater than 5 ATM is the effect the gases have on the internal organs of the fish. Everyone knows that when you catch a grouper, the fight real hard until the get up off the bottom and then they are preceded by a bubble to the surface and the fish kind of gives up and almost floats to the surface as dead weight.

The survivability of an undersized Grouper that has been caught and released in deep water is slim. From what we have seen, the damage to the internal organs is extreme and prevents the fish from surviving anyway. That is why we are being careful with our study of deep water grouper. In actuality, we are catching Red Snapper in deeper water which is causing a problem with their safe release and survivability.

Barotrauma Reef Fish Summary

Thank you for taking time to read about reef fish barotrauma. We promise to work hard to preserve the life of released fish. We have changed and we will continue to look for innovative ways to help save our fishery. If you would like to go fishing with us and witness how gentle we are with reef fish that are being released, please visit our fishing rates page to see which charter is best for

11/24/2010

We must have seen one million baitfish balled up right off the beach today. Everywhere we looked, t**.....**

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WILDE THOUGHTS ON FISH AND FISHERIES

IF I DON'T COMMENT ON IT, WHO WILL?

SATURDAY, FEBRUARY 7, 2009

Australian Barotrauma Study: Fish in a Sock

An experiment conducted by Australian researchers showed there was no difference in survival between unvented fish, vented fish, and those repressurized using drop weights. Experimenal fish were held in a large, vertical enclosure (dubbed the "sock") to document survival rates of treated fish. The photograph shows the sock aboard the DPI&F research vessel Tom Marshall near Double Island Point, Australia.

Ian Brown and colleagues completed, in 2008, a study of barotrauma in several species of Australian reef fishes. This study is commendable both for its scope- it is unquestionably one of the most thorough studies

ABOUT ME

GENE WILDE

I am a Professor of Fishery Ecology, in the Department of Biological Sciences, Texas Tech University.

VIEW MY COMPLETE PROFILE

BLOG ARCHIVE

of barotrauma- and for the novelty of the methods used

Among the six species of fish studied, Ian and colleagues found no difference in survival between vented and unvented individuals.

They also provide the first assessment of the potential use of shot, or drop, weights as a means of repressurizing fish. Again, they found no difference between control fish and those released using shot weights.

A brief description of their results has been presented in video form. The video notes that Ian and colleagues found that barotrauma treatment increased survival of one species (saddletail snapper). Presumably, this resulted from comparing control (untreated) fish against all of those that were treated (vented + shot weight), regardless of treatment type. No treatment affect was observed among the five remaining species.

I was present for some of the initial discussions of this project. There was spirited debate about what constituted a proper control. The concept for, what they now call the "sock" came up in that meeting. To their credit, they developed and used the sock, to good effect, rather than

Assessing the Impact of American Fisheries Society...

Australian Barotrauma Study: Fish in a Sock

Does Venting Promote Survival of Released Fish?

deciding that it would be difficult to employ: a decision far too many researchers on this side of the Pacific would have reached.

Ian et al., G'donya.

The results of this study are available in report form (see below) and are being published in the fishery literature.

Brown, I. W., W. D. Sumpton, M. McLennan, D. J. Welch, J. Kirkwood, A. Butcher, A. Mapleston, D. Mayer, G. Begg, M. Campbell, I. Halliday, and W. Sawynok. 2008. National strategy for the

survival of released line-caught fish: tropical reef species. Project Report PR07-3313, Queensland Department of Primary Industries and Fisheries, Brisbane, Australia.

POSTED BY GENE WILDE AT 5:42 PM
LABELS: BAROTRAUMA, CATCH AND RELEASE FISHING, FISHERY MANAGEMENT, RELEASED FISH SURVIVAL

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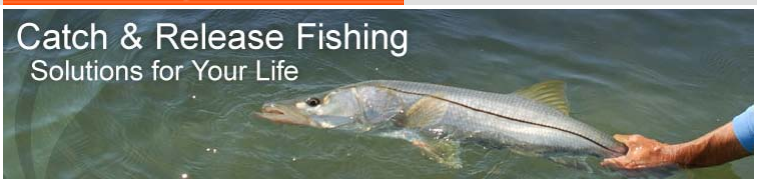


Venting

Venting is a technique used on some deepwater fish species to release gases trapped in the fish's body cavity, allowing it to swim more quickly back to safe habitat depth when released.

Click the 'Play' button to watch this 10-minute video about successfully venting reef fish.

PowerPoint

Watch Fish Venting: How to Use Venting to Improve Survival of Released Fish, a 12-minute PowerPoint-to-Flash tutorial covering the how and why of using venting and deep release rigs to mitigate the effects of barotrauma in reef fish.

Why vent?

Reef fish taken from depths of 50 feet or more may undergo expansion of the gases in the swim bladder as they are brought quickly to the surface on hook and line. Swimbladders can expand only so far before they burst. When the swimbladder bursts, the gases escape into the fish’s body cavity, where they can continue to expand.

The pressure exerted by the gases on the fish's internal organs is considerable, and can result in serious injury to the fish. Often the pressure is sufficient to push the stomach out of the mouth, and the intestines out of the anus.

Moreover, if the fish is released in this buoyant condition, the fish may float away and die from exposure to the elements, or become an easy target for predators.

Regulations

As of June 1, 2008, anyone fishing for any species of reef fish in Gulf of Mexico waters will be required to possess and use a venting tool.

What are venting tools?

- Venting tools are sharpened, hollow instruments that are used to deflate the swim bladder of a fish to release the fish with minimum damage.
- Proper use of a venting tool will help the fish survive by allowing it to safely return to the bottom.
- Examples of venting tools include a hypodermic syringe with the plunger removed or a 16-gauge needle fixed to a wooden dowel (larger gauges may be harmful to the fish). A knife or ice-pick is not allowed.
- Venting tools can be found in stores or online from a number of fishing gear retailers.

When to use venting tools

- When retrieving a fish, carefully assess its condition. Venting should only be done fish that need it. If the fish appears normal, not bloated, and appears able to swim down to habitat depth on its own, do not vent the fish.
- Signs of a fish that needs to be vented include bloated belly, bulging eyes, protrusion of stomach from its mouth, or protrusion of intestines from the anus.

How to vent a fish

- Deflation of a bloated fish is done by holding the fish gently but firmly on its side, and inserting the venting tool needle under a scale into the body cavity at a 45° angle in an area approximately 1 to 2 inches behind the base of the pectoral fin, just deep enough to release the trapped gas.
- If the stomach is protruding from the mouth, do not puncture it or try to put it back into the mouth. It will return to its normal location following the release of the vented fish.
- Gently release the fish head first into the water as soon as possible. If necessary, revive the fish by holding it in the water and moving it back and forth to pass water over the gills until the fish is able to swim.

Florida Sea Grant

Visit Venting: A Guide to Releasing Reef Fish with Ruptured Swimbladders, for more information on venting reef fish.

Partners

Florida Fish and Wildlife Conservation Commission NOAA Fisheries

Related Video

Sustainable Fishing -- Living Green

University of Florida/WUFT-TV Series Dealing with Barotrauma

Australia's Recfishing Research consortium

Related Publications

2010 Recreational Fishing Regulations for GOM Federal Waters Catch-and-Release: Things You Can Do to Help Saltwater Fish Survive [475KB pdf] Circle Hooks Circle Hooks [296KB pdf] Circle Hook Magic [76KB pdf] Gulf of Mexico Red Snapper 2008 Management Measures - Frequently Asked Questions [40KB pdf] New Regulations Requiring Circle Hooks, Dehooking Devices, and Venting Tools for Gulf of Mexico Reef Fish - Frequently Asked Questions [68KB pdf] Release Techniques for Marine Fishes Venting: A Guide to Releasing Reef Fish with Ruptured Swimbladders

Venting: A Guide to Releasing Reef Fish with Ruptured Swimbladders

Proper release of marine fishes has become increasingly important to anglers. In order to maintain healthy fish populations, each angler is responsible for carefully handling fish that are hooked, and releasing fish that are not harvested so they can spawn or perhaps be caught again.

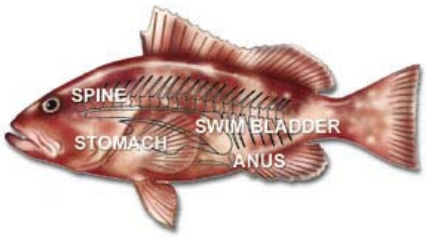
Reef fish may require special handling during release to decrease mortality. This information is based on the best available research regarding reef fish venting as interpreted by a Florida Sea Grant Advisory Panel assembled to review this research. Although the authors realize the need for further study of the influence of venting on long-term reef fish survival, sufficient information exists to warrant providing guidelines to assist anglers in successful release practices.

How To Vent A Fish (Watch the Video from Mote Marine Laboratory)

Download the FSG brochure

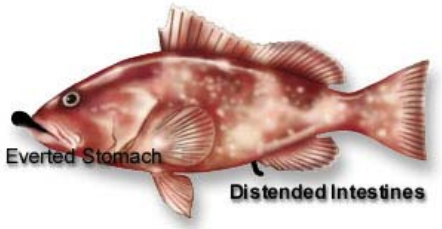
The Problem

Many marine reef fish have a gas-filled organ called a swimbladder, which controls buoyancy and allows the fish to maintain a certain depth in the water column. The gas in the swimbladder can over-expand when fish are brought quickly to the surface by hook and line. This can result in serious injury to the fish, and if released in this buoyant condition, the fish may float away and die from exposure to the elements or become an easy target for predators. This defeats the purpose of fishery management laws such as minimum size restrictions and daily bag limits.



SWIMBLADDER BIOLOGY

Many reef fish have a closed swimbladder, an internal organ filled with gases, mostly oxygen, carbon dioxide, and nitrogen. This organ is located in the peritoneal cavity attached to the fish's backbone beneath the dorsal fin. Swimbladders can expand only so far before they burst. When the swimbladder bursts, the swimbladder gases escape into the fish's body cavity, where they can continue to expand. The pressure exerted by these gases is sufficient to push the stomach out the mouth and the intestines out of the anus. Venting releases these gases from the body cavity, thus eliminating the pressure on the internal organs. If damage is not excessive, the organs will return in place on their own, once the gases are expelled. Venting also will allow the fish to overcome buoyancy problems and swim down to habitat depth, enhancing its immediate survival.



DETERMINING WHICH FISH TO VENT

Scientific studies have shown that species with large swimbladders such as red grouper, black sea bass, and gag derive immediate benefit from venting. Your ability to judge which fish should be vented will improve with practice and experience. After reeling in a fish, closely observe its condition. If the fish is bloated and floats (is unable to control its buoyancy) or if the fish's stomach is distended out of the mouth, the

fish should be vented. If the fish appears normal, not bloated, and is able to swim down to habitat depth on its own, venting is not necessary.

Venting Procedure

It is best to vent the fish as quickly as possible with a minimum of handling. If the fish's stomach is everted out of the fish's mouth, do not attempt to push it back into the fish's body. Expelling the swimbladder gases will allow the stomach to return to its normal position within a few hours. Hold the fish gently but firmly on its side and insert the venting tool at a 45-degree angle approximately one to two inches back from the base of the pectoral fin. Only insert the tool deep enough to release the gases - do not skewer the fish. The sound of the escaping gas is audible and deflation is noticeable. If a fish is extremely bloated, use the hand holding the fish to exert gentle pressure on the fish's abdomen to aid deflation.

Keep a good grip on the venting tool during the entire process, so that an unexpected jerk from the fish does not dislodge the tool and cause injury to others. (Watch a short video from Mote Marine.)

The fish's everted stomach should not be punctured. This practice is not as efficient in releasing gas from the body cavity and results in additional injury.

Return the fish to the water as soon as possible. If necessary, revive it by holding the fish with the head pointed downward and moving the fish back and forth to pass water over the gills until the fish is able to swim unassisted.

Venting Tools

A venting tool can be any hollow, sharpened instrument that allows gases to escape. Ice picks and knives are not suitable because simply puncturing the fish is undesirable and can result in a mortal injury.

The Novak Venting Tool, designed and developed by Florida Sea Grant in cooperation with Mote Marine Laboratory researchers, can be purchased from Aquatic Release Conservation, Inc., (www.dehooker4ARC.com), or by calling its toll free number, 1-877-411-4272.

Venting Tools Available Today (pdf, 106k)

It is also possible to make your own venting tool. The modified hypodermic needle pictured is an excellent choice for a fish venting tool. A hollow, sharpened stainless steel cannula mounted on a hollow wooden dowel also works. Cannulas (16-gauge recommended) can often be purchased from farm supply and feed stores. The tool should be cleaned between uses and kept in a safe and accessible place. Chlorine bleach is a good disinfectant. Be sure to cap or place a cork on the tip of the tool after use to prevent personal injury.

Fish Survival Guidelines

Fishing laws are designed to maintain a desirable spawning stock size to ensure adequate future recruitment of juvenile fish. Compliance with fishing laws is essential for sustaining U.S. sport and commercial fisheries. When compliance means releasing a fish, follow these guidelines to improve its survival.

Have a plan for releasing a fish before landing it. Because time is crucial in keeping a released fish alive, work quickly and in concert with others on board for quick releases.

Avoid using gaffs and landing nets if possible.

Handle the fish as little as possible and try to keep the

fish in the water.

Handle the fish with wet hands, wet gloves or a wet towel to avoid removing the beneficial fish slime and be sure to avoid damaging the gills and eyes.

Back hooks out using pliers or cut the leader as close to the hook as possible on throat-hooked fish. Use hooks which rapidly degrade in saltwater.

Revive an exhausted fish in the water by passing water over the fish's gills by using a gentle back and forth swimming motion until the fish recovers.

This research, conducted by scientists in the Fisheries Biology Program at the Center for Fisheries Enhancement, Mote Marine Laboratory, was sponsored by NOAA, Office of Sea Grant, Department of Commerce, under Grant Number NA36RG-0070.

Information on this page is based on the best available research regarding reef fish venting as interpreted by a Florida Sea Grant Advisory Panel assembled to review this research. Although the authors realize the need for further study of the influence of venting on long term reef fish survival, sufficient information exists to warrant providing guidelines to assist anglers in successful release practices.

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