

WRECKFISH - U.S.

Polyprion americanus

Sometimes known as: Atlantic Wreckfish, Stone Bass

SUMMARY

Wreckfish are a slow growing, long-lived species of fish found along rocky slopes in temperate waters throughout the Atlantic Ocean and in parts of the Indian and Pacific Oceans. In the U.S., most fishing for Wreckfish occurs on the Blake Plateau, off South Carolina and Georgia. The abundance of Wreckfish in U.S. waters is unknown, but significant management regulations are in place. Wreckfish are caught with hook and line, a fishing method that causes little damage to the bottom habitat and has a low amount of bycatch.

Criterion	Points	Final Score	Color
Life History	1.00	2.40 - 4.00	
Abundance	2.25	1.60 - 2.39	
Habitat Quality and Fishing Gear Impacts	4.00	0.00 - 1.59	
Management	2.50		
Bycatch	3.50		
Final Score	2.65		
Color			

LIFE HISTORY

Core Points (only one selection allowed)

If a value for intrinsic rate of increase ('r') is known, assign the score below based on this value. If no r-value is available, assign the score below for the correct age at 50% maturity for females if specified, or for the correct value of growth rate ('k'). If no estimates of r, age at 50% maturity, or k are available, assign the score below based on maximum age.

1.00 Intrinsic rate of increase <0.05; OR age at 50% maturity >10 years; OR growth rate <0.15; OR maximum age >30 years.

Wreckfish are a long-lived species of fish, living up to 39 years in the North Atlantic Ocean (Vaughan et al. 2001) and up to 62 and 76 years for females and males, respectively, in the southwestern Atlantic (Peres and Haimovici 2004). Wreckfish grow slowly, at a rate of $k=0.084$ for males and $k=0.0534$ for females in the southwestern Atlantic (Peres and Klippel 2003) and at a rate of $k=0.03$ (sexes combined) off the US east coast (Vaughan et al. 2001). Sexual maturity is reached by 10 years and 80 cm (31.5 in) total length (TL) for females and 9 years and 75 cm (TL) (29.5 in) for males in the southwestern Atlantic (Peres and Klippel 2003). In the southeastern US waters, sexual maturity is reached at 8 years of age and a size of 79 cm for females and 70 cm for males (Vaughan et al. 2001, Wyanski and Meister 2002). Wreckfish can attain a weight of 100 kg (~200 lb) and a length of 2 m (~6.5 ft) (Roberts 1989).

We have awarded a score of 1 since Wreckfish grow slowly and have a high maximum age.

2.00 Intrinsic rate of increase = 0.05-0.15; OR age at 50% maturity = 5-10 years; OR a growth rate = 0.16–0.30; OR maximum age = 11-30 years.

3.00 Intrinsic rate of increase >0.16; OR age at 50% maturity = 1-5 years; OR growth rate >0.30; OR maximum age <11 years.

Points of Adjustment (multiple selections allowed)

-0.25 Species has special behaviors that make it especially vulnerable to fishing pressure (e.g., spawning aggregations; site fidelity; segregation by sex; migratory bottlenecks; unusual attraction to gear; etc.).

Wreckfish display high site fidelity in areas with deep ledges, outcroppings or caves (Sedberry et al. 2001). In addition, juvenile Wreckfish are commonly found in association with floating debris (Roberts 1989). These behaviors make this species vulnerable to fishing pressure, and thus points are subtracted.

- 0.25 Species has a strategy for sexual development that makes it especially vulnerable to fishing pressure (e.g., age at 50% maturity >20 years; sequential hermaphrodites; extremely low fecundity).
- 0.25 Species has a small or restricted range (e.g., endemism; numerous evolutionarily significant units; restricted to one coastline; e.g., American lobster; striped bass; endemic reef fishes).
- 0.25 Species exhibits high natural population variability driven by broad-scale environmental change (e.g. El Nino; decadal oscillations).
- +0.25 Species does not have special behaviors that increase ease or population consequences of capture OR has special behaviors that make it less vulnerable to fishing pressure (e.g., species is widely dispersed during spawning).
- +0.25 Species has a strategy for sexual development that makes it especially resilient to fishing pressure (e.g., age at 50% maturity <1 year; extremely high fecundity).**

Wreckfish spawn multiple times a year. Estimates of fecundity (i.e. egg production) range from 3 to 12 million eggs in the southwestern Atlantic Ocean and 1 to 4 million eggs in the North Atlantic, with larger fish producing more eggs (Wyanski and Meister 2002; Peres and Klippel 2003). In the North Atlantic, Wreckfish spawn along the western boundary current system of the Blake Plateau off the southeast coast of the US from December to April, with peaks occurring from January to March (Sedberry et al. 2001; Peres and Klippel 2003). Spawning may also occur on the Mid-Atlantic Ridge around the Azores (Fennessy 1998; Sedberry et al. 1999). Wreckfish are considered to have a high fecundity, so points are added.

- +0.25 Species is distributed over a very wide range (e.g., throughout an entire hemisphere or ocean basin; e.g., swordfish; tuna; Patagonian toothfish).**

Wreckfish are found in deep waters along rocky slopes in temperate waters throughout the Atlantic Ocean, including the Mediterranean Sea. They are also found in small sections of the Indian and Pacific Oceans (Heemstra 1986; Roberts, 1989, 1996; Sedberry et al. 1999; Sedberry 2002). In the western Atlantic, Wreckfish are found from the Grand Banks of Newfoundland to La Plata River, Argentina, but primarily occur on the Blake Plateau, which lies between the continental shelf and deep ocean basin off the US east coast from North Carolina to Florida. Population identification studies in the North Atlantic have shown that there is no population separation between the eastern and western Atlantic (Sedberry et al. 1996; Ball et al. 2000). Adult Wreckfish may migrate across the Atlantic and larvae and pelagic juveniles are transported across the Atlantic by ocean currents (Sedberry et al. 1996; Sedberry et al. 2006).

While Wreckfish can be found in several oceans, their habitat in these oceans is limited; therefore, we consider this a medium range and have not added any points.

+0.25 Species does not exhibit high natural population variability driven by broad-scale environmental change (e.g., El Nino; decadal oscillations).

1.00 Points for Life History

ABUNDANCE

Core Points (only one selection allowed)

Compared to natural or un-fished level, the species population is:

1.00 Low: Abundance or biomass is <75% of BMSY or similar proxy (e.g., spawning potential ratio).

2.00 Medium: Abundance or biomass is 75-125% of BMSY or similar proxy; OR population is approaching or recovering from an overfished condition; OR adequate information on abundance or biomass is not available.

Most fishing for Wreckfish in the US takes place in the Charleston Bump area of the Blake Plateau off South Carolina and Georgia. This fishery began during the late 1980's and expanded rapidly, with catches increasing seven fold between 1988 and 1989 to over 4 million lbs (Vaughan et al. 2001). Catches have since been greatly reduced due to the implementation of management regulations. Since the late 1990's catches have averaged around 250,000 lbs (SAFMC 2012a).

Prior to 1994, the US Wreckfish population was undergoing overfishing (i.e. fishing levels too high), but fishing levels have since declined (Vaughan et al. 2001). The most recent population assessment for US Wreckfish was conducted in 2001 (Vaughan et al. 2001). According to this assessment, the abundance of Wreckfish ages 7+ declined from 1991 to 1998, but the amount of younger fish in the population was beginning to increase. Fishing levels were found to be near the threshold level that indicates overfishing is occurring, but there was uncertainty as to whether or not overfishing was still occurring (Vaughan et al. 2001). This assessment did not estimate the total abundance of Wreckfish in relation to biological reference points, and therefore the abundance level of Wreckfish could not be determined (Vaughan et al. 2001). A recent analysis of catch rates of Wreckfish in the US fishery, which can be used as an index of abundance, shows that catch rates declined greatly from 1992 to 1997, then remained stable through 2007 and have since increased through 2010 (SERO 2011). Over the entire time period there was a 35% reduction in catch rates (SERO 2011).

It should be noted that US Wreckfish are part of the wider North Atlantic population, and thus fisheries for Wreckfish in other areas of the North Atlantic will have an impact on US Wreckfish abundance. However, abundance information for Wreckfish in other areas of the North Atlantic is limited (Sadovy 2003).

Since current abundance levels of Wreckfish in US waters are not known, a score of 2 was awarded.

3.00 High: Abundance or biomass is >125% of BMSY or similar proxy.

Points of Adjustment (multiple selections allowed)

- 0.25 The population is declining over a generational time scale (as indicated by biomass estimates or standardized CPUE).
- 0.25 Age, size or sex distribution is skewed relative to the natural condition (e.g., truncated size/age structure or anomalous sex distribution).
- 0.25 Species is listed as "overfished" OR species is listed as "depleted", "endangered", or "threatened" by recognized national or international bodies.
- 0.25 Current levels of abundance are likely to jeopardize the availability of food for other species or cause substantial change in the structure of the associated food web.
- +0.25 The population is increasing over a generational time scale (as indicated by biomass estimates or standardized CPUE).**

According to the 2001 assessment, abundance of Wreckfish ages 7+ declined from the late 1980's to the mid-late 1990's (Vaughan et al. 2001). An updated analysis of catch rates of Wreckfish in the US fishery in 2011 suggests Wreckfish abundance declined greatly from 1992 to 1997, remained stable through 2007 and subsequently increased some through 2010 (SERO 2011). Although catch rates of Wreckfish suggest abundance may have increased slightly in recent years, this increase has not yet occurred over a generational time scale (15.5 years (Froese and Pauly 2011)), so no points are added.

+0.25 Age, size or sex distribution is functionally normal.

During the 1980's and 1990's the average weight of Wreckfish caught in the commercial fishery was 13 kg (29 lbs) (Vaughan 1998) and the mean weight remained fairly stable through 2002 (Vaughan 2003). Although there have been significant differences in the length frequency distribution of Wreckfish over time, mean lengths of Wreckfish have remained stable since the beginning of the fishery in the late 1980's through 2010 (SERO 2011). Points are therefore added.

- +0.25 Species is close to virgin biomass.**

+0.25 **Current levels of abundance provide adequate food for other predators or are not known to affect the structure of the associated food web.**

Wreckfish primarily feed on fish and squid, but also on crustaceans and shrimp (Weaver and Sedberry 2001, Goldman and Sedberry 2011). Pelagic juveniles may feed near floating objects, such as fish aggregating devices (Deudero and Morales-Nin 2000). There are no known predators of Wreckfish (NOAA 2012). Because abundance levels are not known, we have not added any points.

2.25 Points for Abundance

HABITAT QUALITY AND FISHING GEAR IMPACTS

Core Points (only one selection allowed)

Select the option that most accurately describes the effect of the fishing method upon the habitat that it affects

- 1.00 The fishing method causes great damage to physical and biogenic habitats (e.g., cyanide; blasting; bottom trawling; dredging).
- 2.00 The fishing method does moderate damage to physical and biogenic habitats (e.g., bottom gillnets; traps and pots; bottom longlines).
- 3.00 The fishing method does little damage to physical or biogenic habitats (e.g., hand picking; hand raking; hook and line; pelagic long lines; mid-water trawl or gillnet; purse seines).**

In the US, most Wreckfish are caught over the Charleston Bump, which is a very large ridge system found off the coast of South Carolina and Georgia from depths of 450-600 m (1,476-1,969 ft) (Sedberry et al. 1999). Some fishermen also target Wreckfish in the Florida Keys (NOAA 2012). In 2010, 257,300 lbs of Wreckfish were caught (NOAA 2012). Wreckfish are caught with hook and line gear. Fishermen use hydraulic reels with 1/8 inch thick cable to which they attach multiple baited circle hooks (NOAA 2012). In recent years there have been around 20 shareholders in the US Wreckfish commercial fishery, with only 7 of them actually participating in the fishery (FR 2012). Management measures implemented in 2012 revoked shares of inactive vessels, and redistributed them to the active participants (SAFMC 2012b).

Hook and line gear causes little damage to bottom habitats, so a score of 3 is awarded.

Points of Adjustment (multiple selections allowed)

- 0.25 Habitat for this species is so compromised from non-fishery impacts that the ability of the habitat to support this species is substantially reduced (e.g., dams; pollution; coastal development).
- 0.25 Critical habitat areas (e.g., spawning areas) for this species are not protected by management using time/area closures, marine reserves, etc.
- 0.25 No efforts are being made to minimize damage from existing gear types OR new or modified gear is increasing habitat damage (e.g., fitting trawls with roller rigs or rockhopping gear; more robust gear for deep-sea fisheries).
- 0.25 If gear impacts are substantial, resilience of affected habitats is very slow (e.g., deep water corals; rocky bottoms).

+0.25 Habitat for this species remains robust and viable and is capable of supporting this species.

The Charleston Bump is considered essential fish habitat for Wreckfish for feeding and spawning (Sedberry et al. 2006, Goldman and Sedberry 2011), and this is where most fishing for this species occurs (Sedberry et al. 2001). Adult Wreckfish are found at depths ranging from 42 to 1,000 m (138-3,280 ft) over rocky ridge systems (Sedberry et al. 2001). Juvenile Wreckfish can spend up to a year or more living at the sea surface (Sedberry et al. 2001). There is no indication that this habitat is not capable of supporting Wreckfish (Sadovy 2003), so points are added.

+0.25 Critical habitat areas (e.g., spawning areas) for this species are protected by management using time/area closures, marine reserves, etc.

A spawning season closure for Wreckfish is currently in place (SAFMC 2012a), so points are added.

+0.25 Gear innovations are being implemented over a majority of the fishing area to minimize damage from gear types OR no innovations necessary because gear effects are minimal.

The South Atlantic Fishery Management Council banned the use of bottom longlines to catch Wreckfish because of frequent gear loss and impacts to the bottom habitat (Gauvin et al. 1994). The hook and line fishery that currently fishes for Wreckfish does not need gear innovations because the effects on the bottom habitat are minimal. Thus points are added.

+0.25 If gear impacts are substantial, resilience of affected habitats is fast (e.g., mud or sandy bottoms) OR gear effects are minimal.

Gear effects are minimal, so points are added.

4.00 Points for Habitat Quality and Fishing Gear Impacts

MANAGEMENT

Core Points (only one selection allowed)

Select the option that most accurately describes the current management of the fisheries of this species.

1.00 Regulations are ineffective (e.g., illegal fishing or overfishing is occurring) OR the fishery is unregulated (i.e., no control rules are in effect).

2.00 Management measures are in place over a major portion over the species' range but implementation has not met conservation goals OR management measures are in place but have not been in place long enough to determine if they are likely to achieve conservation and sustainability goals.

The US South Atlantic Wreckfish fishery began in the late 1980's and expanded rapidly (SAFMC 1990a). Starting in 1990, the South Atlantic Fishery Management Council (SAFMC) began managing Wreckfish under the Snapper Grouper Management Plan (SAFMC 2012a). Since this time, the Wreckfish fishery has been managed through an individual transferable quota system, whereby the total allowable catch for Wreckfish is split among shareholders or participants. The total allowable commercial catch for Wreckfish was recently substantially reduced from 2 million lbs to 237,500 lbs, which has essentially capped Wreckfish catches at their current level (SAFMC 2012c). There were previously around 20 shareholders in the US Wreckfish commercial fishery, but only 7 of them have been participating in the fishery in recent years. Recent regulations revoked the catch shares of all inactive Wreckfish stakeholders and redistributed the catch shares amongst active participants (SAFMC 2012b). Other management measures include a spawning season closure from January 15th to April 15th and gear restrictions. Recreational fishing for Wreckfish is allowed only during July and August, and there is a bag limit of 1 fish per vessel per day and an annual catch limit of 12,500 lbs (SAFMC 2012a).

Although substantial management measures are in place in the US Wreckfish fishery, the abundance of Wreckfish is unknown and conservation abundance targets have not been

defined. Therefore, it cannot be determined if conservation and sustainability goals are being achieved, so a score of 2 is awarded.

- 3.00 Substantial management measures are in place over a large portion of the species range and have demonstrated success in achieving conservation and sustainability goals.

Points of Adjustment (multiple selections allowed)

- 0.25 There is inadequate scientific monitoring of stock status, catch or fishing effort.
- 0.25 Management does not explicitly address fishery effects on habitat, food webs, and ecosystems.
- 0.25 This species is overfished and no recovery plan or an ineffective recovery plan is in place.
- 0.25 Management has failed to reduce excess capacity in this fishery or implements subsidies that result in excess capacity in this fishery.
- +0.25 **There is adequate scientific monitoring, analysis and interpretation of stock status, catch and fishing effort.**

Catches of Wreckfish are monitored to ensure they do not exceed the total allowable catch (SAFMC 1990b). Catch rates of Wreckfish in the US commercial fishery are also monitored and can be used to provide an index of abundance (SERO 2011). However, the last population assessment for Wreckfish was in 2001 (Vaughan et al. 2001). This assessment did not estimate abundance levels in relation to target abundance reference points, and there was some uncertainty as to whether overfishing was occurring or not (Vaughan et al. 2001). Although there is some monitoring of the US Wreckfish population, the stock status of Wreckfish remains uncertain and thus no points are added.

- +0.25 **Management explicitly and effectively addresses fishery effects on habitat, food webs, and ecosystems.**

The South Atlantic Fishery Management Council, which manages Wreckfish, addresses fishery effects on the ecosystem, including habitat and bycatch concerns (SAFMC 2009, SAFMC 2011).

- +0.25 This species is overfished and there is a recovery plan (including benchmarks, timetables and methods to evaluate success) in place that is showing signs of success OR recovery plan is not needed.

+0.25 Management has taken action to control excess capacity or reduce subsidies that result in excess capacity OR no measures are necessary because fishery is not overcapitalized.

Managers have implemented a limited entry system and an annual catch limit, which is divided among fishery participants, to control excess capacity in the US Atlantic Wreckfish fishery. As of 2012, there were only 7 participants in the fishery (SAFMC 2012b). Points are therefore added.

2.50 Points for Management

BYCATCH

Core Points (only one selection allowed)

Select the option that most accurately describes the current level of bycatch and the consequences that result from fishing this species. The term, "bycatch" used in this document excludes incidental catch of a species for which an adequate management framework exists. The terms, "endangered, threatened, or protected," used in this document refer to species status that is determined by national legislation such as the U.S. Endangered Species Act, the U.S. Marine Mammal Protection Act (or another nation's equivalent), the IUCN Red List, or a credible scientific body such as the American Fisheries Society.

- 1.00 Bycatch in this fishery is high (>100% of targeted landings), OR regularly includes a "threatened, endangered or protected species."
- 2.00 Bycatch in this fishery is moderate (10-99% of targeted landings) AND does not regularly include "threatened, endangered or protected species" OR level of bycatch is unknown.
- 3.00 Bycatch in this fishery is low (<10% of targeted landings) and does not regularly include "threatened, endangered or protected species."**

In the US hook and line Wreckfish fishery, catches of marine mammals are rare (FR 2011). Sea turtles are vulnerable to capture in hook and line gear (SAFMC 2012b), but given that fishing for Wreckfish occurs in deep waters, catches of sea turtles are likely rare. Information on other bycatch in this fishery is limited, but bycatch has been documented to include barrelfish and red bream, as well as small amounts of splendid alfonsino, conger eel, and small sharks (Goldman and Sedberry 2011). Hook and line fisheries typically have a low amount of bycatch (Morgan and Chuenpagdee 2003). Additionally, this fishery occurs over a small localized area, and appears to be selective

for only a few species and size classes (Goldman and Sedberry 2011). We have therefore awarded a score of 3.

Points of Adjustment (multiple selections allowed)

- 0.25 Bycatch in this fishery is a contributing factor to the decline of "threatened, endangered, or protected species" and no effective measures are being taken to reduce it.
- 0.25 Bycatch of targeted or non-targeted species (e.g., undersize individuals) in this fishery is high and no measures are being taken to reduce it.
- 0.25 Bycatch of this species (e.g., undersize individuals) in other fisheries is high OR bycatch of this species in other fisheries inhibits its recovery, and no measures are being taken to reduce it.
- 0.25 The continued removal of the bycatch species contributes to its decline.
- +0.25 Measures taken over a major portion of the species range have been shown to reduce bycatch of "threatened, endangered, or protected species" or bycatch rates are no longer deemed to affect the abundance of the "protected" bycatch species OR no measures needed because fishery is highly selective (e.g., harpoon; spear).**

Bycatch of marine mammals is rare in the Wreckfish fishery (FR 2011), and there are no known endangered/threatened species bycatch concerns. Thus points are added.

- +0.25 There is bycatch of targeted (e.g., undersize individuals) or non-targeted species in this fishery and measures (e.g., gear modifications) have been implemented that have been shown to reduce bycatch over a large portion of the species range OR no measures are needed because fishery is highly selective (e.g., harpoon; spear).**

Bycatch in the Wreckfish fishery includes barrelfish and red bream, and small amounts of splendid alfonsino, conger eels, and small sharks (Goldman and Sedberry 2011). Both barrelfish and red bream may be kept and utilized. The hook and line gear used in the fishery is considered to be fairly selective and bycatch measures are not considered to be needed. Therefore, points are added.

- +0.25 Bycatch of this species in other fisheries is low OR bycatch of this species in other fisheries inhibits its recovery, but effective measures are being taken to reduce it over a large portion of the range.
- +0.25 The continued removal of the bycatch species in the targeted fishery has had or will likely have little or no impact on populations of the bycatch species OR there are no significant bycatch concerns because the fishery is highly selective (e.g., harpoon; spear).

3.50 Points for Bycatch

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