

**PETITION TO LIST THE  
Warsaw Grouper (*Epinephelus nigritus*)  
UNDER THE U.S. ENDANGERED SPECIES ACT**



Photo: Institute for Exploration and the University of Rhode Island Institute for Archeological Oceanography

**Petition Submitted to the U.S. Secretary of Commerce, Acting Through the National Oceanic and Atmospheric Administration Fisheries Service & the U.S. Secretary of Interior, Acting through the U.S. Fish and Wildlife Service**

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### **Executive Summary**

While a wide-ranging fish, the Warsaw Grouper (*Epinephelus nigritus*) is increasingly rare and imperiled within that range. The reason is simple: too much fishing by too many people. This species is commercially valuable and has been, and is being, fished by commercial and recreational fishers, whether intentionally or as bycatch.

A caught Warsaw Grouper is a dead Warsaw Grouper: because it is valuable and because this species suffers from “the bends” (barotrauma) when brought up from the deep waters where adults dwell. Even catch-and-release would not help under this condition, as the barotrauma itself can cause death.

This grouper is also extremely susceptible to population declines from fishing because of biological constraints: the species doesn’t reach maturity until 9 years of age. It grows and matures slowly. It is a protogynous hermaphrodite: all individuals are female until some transition to male at 9 years old. The species is long-lived, with longevity of 41 years. It is also large-bodied, reaching up to 7.7 feet long and 440 pounds in weight, and therefore a trophy species. The Warsaw Grouper aggregates for spawning in specific areas, at which they can be readily exploited by fishers.

All of these traits combined: a long-lived, large-bodied, late maturing, aggregating fish make it highly susceptible to declines from fishing. And it has indeed succumbed to that threat. Current regulations aren’t safeguarding it: with over one million recreational fishers in Florida alone, a one fish per vessel limit is not an adequate safeguard. In addition, current management regulations driving fishers to deeper waters are themselves harming this deep-water fish.

The Warsaw grouper is one of many grouper species that is imperiled. It is also part of a pattern of large-bodied predatory fish imperilment, which scientists increasingly attribute to human population growth. While fishing is the primary direct threat to the Warsaw Grouper, human population growth drives the magnitude of that threat. This fish urgently needs protection from the threat posed by fishing by growing human populations.

WildEarth Guardians therefore requests that the National Marine Fisheries Service and U.S. Fish and Wildlife Service list the Warsaw Grouper as Endangered or Threatened under the Endangered Species Act and provide it with critical habitat.

## Introduction

WildEarth Guardians hereby petitions the Secretary of Commerce, acting through the National Marine Fisheries Service (NMFS) within the National Oceanic and Atmospheric Administration (NOAA), and the Secretary of the Interior, acting through the U.S. Fish and Wildlife Service, to list and thereby protect under the Endangered Species Act (ESA) the Warsaw Grouper (*Epinephelus nigritus*).

NMFS designated this fish as a species of concern (NMFS 2010). The International Union for Conservation of Nature and Natural Resources (IUCN) lists the Warsaw Grouper as “critically endangered” (Chuen and Huntsman 2006). The American Fisheries Society ranks it as “endangered” (NMFS 2010). NatureServe ranks it as “vulnerable” (NatureServe 2009). By all accounts this species is imperiled.

This grouper’s endangerment is part of a pattern of imperilment of many grouper species (Morris et al. 2000), as well as large-bodied predatory fishes more broadly (Koenig et al. 2000; Stallings 2009). State Morris et al. (2000: 937):

The rapidity of the decline of many grouper species is of extreme concern. Local populations can be extirpated in a matter of a few years. If steps are not taken to halt these declines, normal spawning behaviour could be affected, genetic diversity will be lost, and global population densities could fall below the critical levels needed for the eventual recovery of species. Extinction of even widespread species is possible unless the threats facing groupers are recognised and addressed. It will likely prove impossible to protect individual grouper species from extinction without implementing broader schemes such as no-take marine reserves, which focus on ecosystem protection and protect all species within them from fishing pressure and habitat destruction.

The primary threat to the Warsaw Grouper is fishing, whether intentionally or as bycatch, from gill-nets, longlines, bottom trawls, and other fishing gear and activities (NMFS 2010). Recreational fishers from the U.S. likely play an important role in endangering this species, and 99 percent of the Warsaw Grouper catch occurs in the Gulf of Mexico (Chuen and Huntsman 2006). An underlying driver of the fishing threat is high human population density and growth (Stallings 2009).

In light of the Warsaw Grouper’s imperilment, WildEarth Guardians requests listing of this species under the U.S. Endangered Species Act (ESA). Federal protection will give this fish its best chance of survival. Over 99% of the species listed under the ESA still exist.<sup>1</sup> The ESA is the Warsaw Grouper’s best hedge against extinction.

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<sup>1</sup>Compare the number of species currently listed under the ESA (1321) with the species that have been delisted due to extinction (9). See <http://www.fws.gov/endangered/wildlife.html> [Accessed November 2009].

### **Endangered Species Act Implementing Regulations**

Section 424 of the regulations implementing the Endangered Species Act (50 C.F.R. § 424) is applicable to this petition. Subsections that concern the formal listing of the Warsaw Grouper as an Endangered or Threatened species are:

424.02(e) “*Endangered species* means a species that is in danger of extinction throughout all or a significant portion of its range.”...(k) “species” includes any species or subspecies that interbreeds when mature. *See also* 16 U.S.C § 1532(6).

(m) “*Threatened species* means any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” *See also* 16 U.S.C § 1532(20).

ESA Section 4 (16 U.S.C. § 1533(a)(1)) sets forth listing factors under which a species can qualify for ESA protection (see also 50 C.F.R. § 424.11(c)):

- A. The present or threatened destruction, modification, or curtailment of habitat or range;
- B. Overutilization for commercial, recreational, scientific, or educational purposes;
- C. Disease or predation;
- D. The inadequacy of existing regulatory mechanisms; and
- E. Other natural or manmade factors affecting its continued existence.

At least three factors set forth in 50 C.F.R. § 424.11(c) and in ESA Section 4 (16 U.S.C. § 1533(a)(1)) have resulted in the continued decline of the Warsaw Grouper and are causing the species to face extinction or endangerment in the foreseeable future. This species has declined and continues to decline due to fishing (Factor B); has biological constraints that increase susceptibility to adverse fishing impacts (Factor E); and is inadequately protected from the threats it faces (Factor D). A taxon needs to meet only one of the listing factors outlined in the ESA to qualify for federal listing.

### **Description of Petitioner**

WildEarth Guardians is a non-profit environmental organization whose mission is to restore wildlife, wild places, and wild rivers in the American West. WildEarth Guardians has over 4,500 members. The organization has an active endangered species protection campaign, with a geographic focus on the western United States (although the organization has a national scope). As part of this campaign, Guardians works to obtain or upgrade ESA protection for a wide variety of imperiled wildlife and plants and the ecosystems on which they depend.

### Classification and Nomenclature

**Common Name.** *Epinephelus nigritus* is known by the common names “Warsaw grouper,” “black grouper,” “mero negro,” “mérrou Polonaise,” and “mérrou Varsovie” (Chuen and Huntsman 2006). Throughout the petition, we refer to this species as the Warsaw Grouper or Grouper.

**Taxonomy.** The petitioned species is *Epinephelus nigritus* Holbrook 1855. The taxonomic classification for this species is shown in Table 1.

**Table 1. Taxonomy of *Epinephelus nigritus*.**

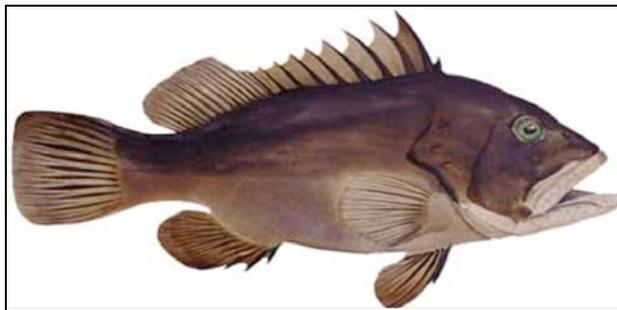
Phylum	Chordata
Class	Actinopterygii
Order	Perciformes
Family	Serranidae
Genus	<i>Epinephelus</i>
Species	<i>Epinephelus nigritus</i>

### Description

The Grouper is large, with maximum size approximately 7.7 ft (235 cm) and 440 lbs (200 kg). NMFS (2010) provides the following description:

...characterized by an elongated second spine in the dorsal fin, the rear margin of the caudal fin is convex or truncate with rounded corners, and their pelvic fins are longer than the pectoral fins. They are the only grouper with 10 dorsal spines. They are dark reddish brown or brownish grey to almost black in color dorsally, dull reddish grey below. Juveniles have a yellow caudal fin and a few randomly scattered whitish spots on the body.

See Figure 1.



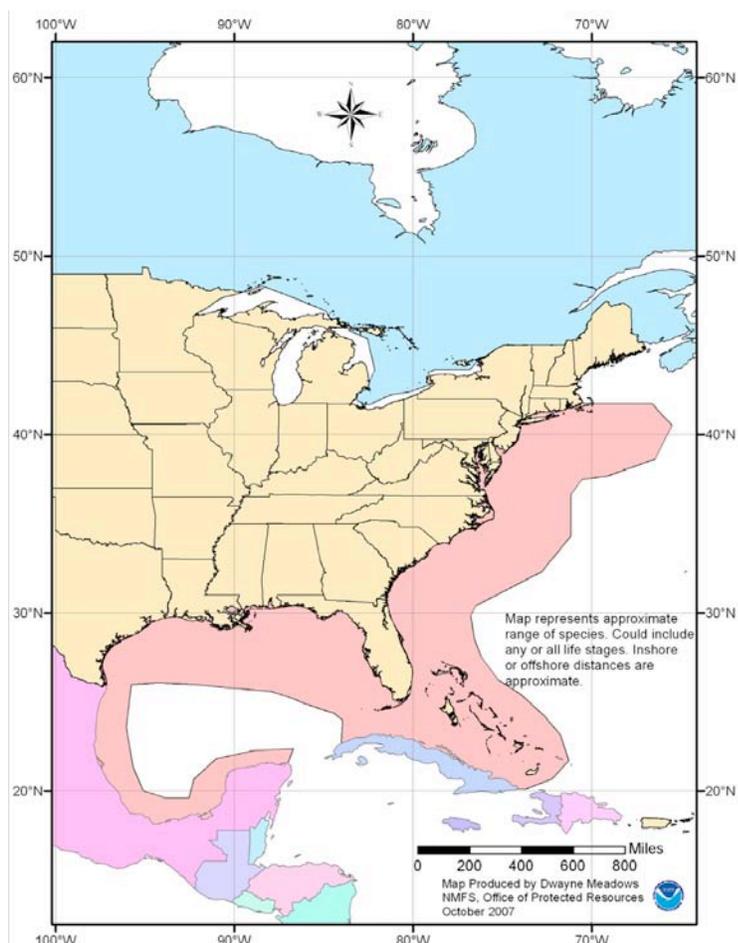
**Figure 1: Sketch of Warsaw Grouper.**  
Source: C.S. Mannoeh, in NMFS 2010.

### Distinctive traits

The Warsaw Grouper is the only grouper with 10 dorsal spines. *Id.*

### **Geographic Distribution: Historic and Current**

The Warsaw Grouper occurs in the Western Atlantic Ocean, from Massachusetts to the Gulf of Mexico, Cuba, Trinidad, and down the coast of South America (Chuen and Huntsman 2006). NMFS defines the Species of Concern range for the Warsaw Grouper as including the U.S. Atlantic Coast and Gulf of Mexico (Figure 2).



**Figure 2: The Warsaw Grouper's Species of Concern Range.**  
Source: NMFS (2010).

### **Habitat Requirements**

The Warsaw Grouper is a deep-sea grouper. The species inhabits reefs on the continental shelf break in waters that are 180-1700 ft (55-525 m) deep. Adults inhabit rocky bottoms, whereas juveniles can be found in shallow-water reefs and around jetties (Fishbase 2010; NMFS 2010).

### Life History

This species is long-lived, reaching ages of up to 41 years, and has slow maturation and growth rates (Chuen and Huntsman 2006; NMFS 2010).

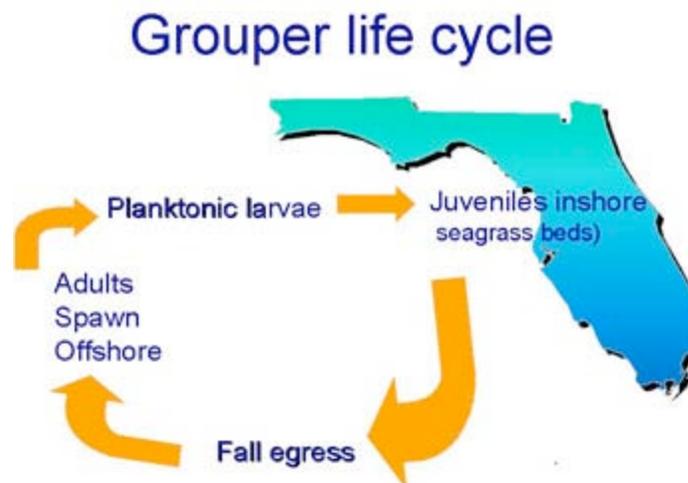
#### Diet

The Grouper engulfs its prey whole, feeding largely on crabs, shrimps, lobsters, and other fishes (Chuen and Huntsman 2006; Fishbase 2010). It either ambushes its prey or captures it after a brief chase. *Id.*

#### Reproduction & Dispersal

The Grouper is a protogynous hermaphrodite, and therefore all individuals are female at birth. It reaches sexual maturity at approximately age 9, at which point some Groupers transform into males. It has low resilience to fishing, with a minimum population doubling time of 4.5-14 years (Chuen and Huntsman 2006; Fishbase 2010; NMFS 2010).

The species spawns offshore, juveniles are often in near shore areas, and adults are usually on rough rocky bottoms (Chuen and Huntsman 2006) (Figure 3).



**Figure 3: Life Cycle for Species in the Serranidae Family.** Source: [http://www.bio.fsu.edu/coleman\\_lab/grouper\\_ecology.php](http://www.bio.fsu.edu/coleman_lab/grouper_ecology.php) [Accessed February 2010].

This species aggregates at specific habitat sites for spawning. In the Gulf of Mexico, it spawns from August-September (NMFS 2010).

### **Ecology**

Groupers play important roles as apex predators in the marine food chain, but the heavy fishing that has already occurred has likely reduced the Grouper's ecological effectiveness. Write Koenig et al. (2000: 594):

...because marine benthic fisheries focus most intensely on apex predators (e.g., groupers, snappers, amberjacks, sharks), these species are commonly reduced or absent in heavily fished systems. The complete extent of ecosystem changes is unknown in most cases because virtually all areas have been fished for so many years that society has lost any historical perspective (Jackson, 1997). The condition of the habitat now considered 'normal' is probably far from the original baseline.

The reversal of the Grouper's current imperilment and population declines is therefore vitally important from an ecological standpoint. The Grouper is both ecologically important, and its protection requires the establishment of no-take marine reserves that can help safeguard whole ecosystems (Morris et al. 2000). Given the ecosystem protection purpose of the ESA,<sup>2</sup> it is especially imperative that this vital ecosystem actor be safeguarded under the Act.

### **Historic and Current Population Status & Trends**

NatureServe (2009) describes its range and imperilment:

Widespread distribution in the western Atlantic but may be naturally rare; declining population trends apparent in heavily fished areas such as the U.S. western Atlantic, despite protective fisheries regulations U.S. territorial waters; considered highly threatened by intense fishing due to certain life history characteristics.

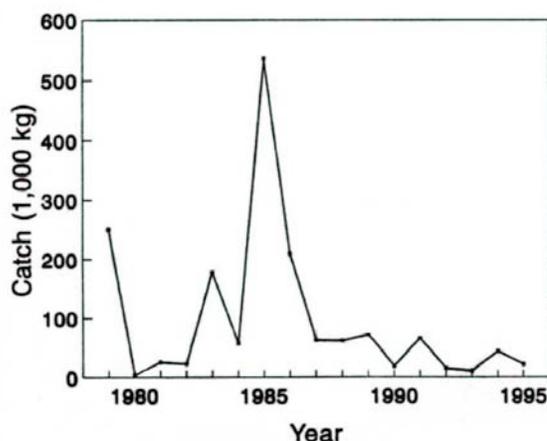
Scientists indicate that the U.S. population of the Warsaw Grouper is endangered and has exhibited a "steady and drastic decline in abundance, with males being rare (Huntsman, pers. obs., cited in Chuen and Huntsman 2006). The IUCN lists the Warsaw Grouper as "critically endangered" (Chuen and Huntsman 2006). The American Fisheries Society ranks it as "endangered" (NMFS 2010). NatureServe ranks it as "vulnerable" (NatureServe 2009).

NMFS (2010) reports that the species' population declined sharply in the 1980s (Figure 4) and further notes:

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<sup>2</sup>The ESA states: "The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species..." 16 U.S.C. § 1531(b).

Landings of warsaw grouper declined 70 percent by weight and numbers from 1988 to 1990 in the South Atlantic (Parker and Mays 1998). In addition, the mean weight of warsaw grouper being landed during 1988 to 1990 (15 pounds) was below the minimum weight of an adult warsaw grouper (Timi Jordan, NMFS, personal communication).



**Figure 4: Warsaw Grouper Catch (in kilograms) for all fisheries combined.**

Source: Parker and Mays 1998, cited in NMFS 2010.

In a study in North Carolina, Rudershausen et al. (2008) found that, while Warsaw Groupers were caught in the 1970s, they were not caught in 2005-2006. They made up a minute percentage (0.023%) of the fish community at a study site in Florida (Koenig et al. 2000).

The best available information shows clearly that this species is imperiled and likely declining.

#### **Identified Threats to the Petitioned Species: Criteria for Listing**

The Warsaw Grouper meets at least three of the criteria for listing under the ESA (bolded):

- A. Present and threatened destruction, modification, and curtailment of habitat and range;
- B. Overutilization for commercial and recreational purposes;**
- C. Disease or predation;
- D. The inadequacy of existing regulatory mechanisms; and**
- E. Other natural or manmade factors affecting its continued existence.**

Historic and continued overfishing of this commercially valuable grouper is a threat

(Factor B). A lack of adequate legal protections in the U.S. and elsewhere is an additional threat (Factor D). The biological constraints of the Warsaw Grouper include its slow growth and maturation, which hinders its ability to recover from historic and continued overutilization (Factor E). A driver of the fishing threat is human population growth (Factor E).

### **I. Present and Threatened Destruction, Modification, or Curtailment of Habitat or Range.**

Habitat loss and degradation may be a threat to this species, which NMFS should analyze it fully during a status review. Camhi et al. (1998) discuss the alarming rate at which coastal habitat is being destroyed, including in the United States. An additional threat to high-level predators is the bio-accumulation of pollutants. *Id.* Koenig et al. (2000) report the adverse affects of trawling and dredging on habitat at a Florida site within the Grouper's range.

If NMFS considers coral reef habitat to be important for this species, habitat degradation in the form of coral reef destruction should be considered a serious threat. *See* WildEarth Guardians (2009) petition to list the Bumphead Parrotfish, including attachments, for documentation of threats to coral reefs worldwide.

### **II. Overutilization for commercial, recreational, scientific, or educational purposes**

The primary threat to the Warsaw Grouper is historic and continued overfishing (Chuen and Huntsman 2006; NatureServe 2009; NMFS 2010). Its slow rate of growth and maturation, large body, and aggregation at specific sites for spawning (discussed under Listing Factor E), combined with its high commercial value, makes it particularly susceptible to depletion from fishers. It is threatened by target and bycatch fishing; longline and handline fishers; gill nets and driftnets; and bottom trawls. *Id.* 99% of Warsaw Groupers are caught in the Gulf of Mexico (Chuen and Huntsman 2006).

Fishbase.org indicates that the Warsaw Group is in the "very high" price category (Fishbase 2010). Other researchers likewise consider the species as economically valuable (Parker and Mays 1998; Koenig et al. 2000; Morris et al. 2000). This high value likely increases intentional fishing for this species.



**Figure 5: Recreational Fishing for Warsaw Grouper.**

Source: <http://captbrett.com/2006/06/> [Accessed February 2010].

Even if a Warsaw Grouper is released by a fisher, if it has been pulled from deep waters, it can suffer barotrauma (e.g., the bends and hemorrhaging) and perish (Chuen and Huntsman 2006).

As discussed previously, this species has low resilience to fishing, with a population doubling time of 4.5-14 years (Chuen and Huntsman 2006; Fishbase 2010).

Rudershausen et al. (2008: 1402) describe groupers as “among the first reef fishes to be depleted from overfishing.”

Chuen and Huntsman (2006) report: “the South Atlantic Fisheries Management Council considers the species as overfished and undergoing overfishing (NMFS 2003).” The American Fisheries Society (AFS) wrote that the species is either overfished or in danger of being overfished in the southeastern U.S. (AFS, undated).

### **III. Disease or Predation**

Disease or predation is not known to be a threat to this species, but NMFS should analyze it fully during a status review.

### **IV. The inadequacy of existing regulatory mechanisms**

The Warsaw Grouper is not adequately protected by federal, state, or international laws or policies to prevent its endangerment or extinction.

### *Scientific Rankings*

IUCN ranks the Warsaw Grouper as “Critically Endangered,” defined as “considered to be facing a high risk of extinction in the wild” (Chuen and Huntsman 2006).<sup>3</sup> Although this designation is important for flagging the extinction risk to this fish, it confers no regulatory protections.

### *U.S. Federal Status*

This species was previously designated a candidate for ESA listing. In a June 1999 Federal Register notice, NMFS added this species to the candidate list and specified its area of concern as from Massachusetts south to the Gulf of Mexico (NMFS 1999). NMFS wrote:

As resources permit, NMFS intends to conduct status reviews on candidate species, collect further documentation on them, and make appropriate amendments to the accompanying table [of candidate species] during the next revision. *Id.* at p. 33466.

Currently, NMFS merely ranks the Warsaw Grouper as a Species of Concern. According to NMFS,

Species of Concern are those species about which NOAA’s National Marine Fisheries Service (NMFS) has some concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act (ESA). We wish to draw proactive attention and conservation action to these species. ‘Species of concern’ status does not carry any procedural or substantive protections under the ESA.<sup>4</sup>

### *Fishing Regulations*

Fishing regulations are not adequate to protect this species. As noted above, most Warsaw Groupers are caught in the Gulf of Mexico. According to Chuen and Huntsman (2006):

In the Gulf of Mexico commercial fishery, there are no possession limits for the species for federally permitted reef fish vessels, and the species is managed under the deep-water grouper commercial quota.

Despite the introduction of management, there continues to be killing of the species in bycatch which is unlikely to be reported.

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<sup>3</sup>See <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria#categories> [Accessed November 2009].

<sup>4</sup>See <http://www.nmfs.noaa.gov/pr/species/concern/#list> [Accessed January 2010].

There is no minimum size for the species in the Gulf of Mexico and there is a 726 mt overall deep-water grouper quota. *Id.* In the U.S. South Atlantic, one fish per vessel per trip is allowed. *Id.* However, given the enormous number of fishing licenses in Florida alone, this limit is not adequate to prevent the extinction of the Warsaw Grouper.

Chuen and Huntsman (2006) note that the *management* of fishing is itself posing a threat to the Warsaw Grouper:

An immediate threat to this species is related to management of the commercial bottom long-line fishery of the southeastern US. The management trend has been to restrict such indiscriminate gear to deeper waters. If this management trend continues Warsaw Grouper and other deep-water species like it (Speckled Hind, Snowy Grouper, Yellowedge Grouper, and several species of tilefish) will experience an even greater impact than they do now because barotrauma (expansion of enclosed gases in the swimbladder - embolism) results in hemorrhage and eventual death as these deepwater fish are brought to the surface (Coleman and Williams 2002, Coleman *et al.* 2004).

There is also a trend for the recreational fishery to operate in deeper water as shallower stocks become depleted. Even though there is a daily bag limit and trip limit for groupers, there are so many recreational fishermen (over 1 million saltwater licenses in Florida alone) that the potential impact on the already depleted Warsaw Grouper population is serious.

There is an urgent need for upgraded protections for this species. NatureServe (2009) recommends that:

Occurrences should be protected to ensure long-term survival. Stocks should be managed to maintain adequate reproductive (spawning) stock biomass to sustain recruitment. Serious consideration should be given to the protection of spawning aggregations, at a minimum by prohibiting spear guns and fish traps and by permitting only low levels of exploitation at most. The introduction of no-fishing zones in critical areas also needs to be considered as a management option to address the problem of overfishing (Sadovy, in press).

Koenig *et al.* (2000) likewise recommend year-round, no-take reserves to protect spawning aggregations of species such as the Grouper, as do Morris *et al.* (2000).

## **V. Other natural or manmade factors affecting its continued existence**

*Biological Vulnerability.* As discussed above, this species has a number of biological constraints that make it more susceptible to extinction: it is slow to grow and mature, with individuals reaching maturity until 9 years of age; and it aggregates at specific sites

for spawning (Chuen and Huntsman 2006; NatureServe 2009; Fishbase 2010; NMFS 2010). It is therefore considered as having low resilience to fishing. *Id.* Dulvy et al. (2003) discuss the correlation between body size and extinction risk, with larger animals at increased risk. This relationship may exist because larger animals are targeted and because of correlation of large size with additional factors, such as low population increase rates, late maturity, dependence on more vulnerable habitats, and behavior that may make them more catchable. As a large fish (reaching as much as 7.7 ft), the Grouper is vulnerable to extinction.

Researchers have documented these biological constraints as significant for the conservation status of groupers in general (Morris et al. 2000; Koenig et al. 2000). Koenig et al. (2000: 610) elaborate on threats from fishers targeting spawning aggregations:

Fishers concentrate on spawning aggregations because the aggregations are predictable...and because doing so greatly increases catch per unit effort...Acute effects of aggregation fishing include the total loss of aggregations; chronic effects may include deterioration of reproductive capacity and altered genetic composition of the stock. In either case, ample evidence shows that aggregation fishing rapidly undermines sustained fishery production...

Moreover, these researchers find that “The synergy of the life history traits of protogyny and aggregation spawning appears to increase dramatically the vulnerability of reef species to overfishing when effort is concentrated on spawning fish...” *Id.* Rudershausen et al. (2008) discuss how removing large individuals of a protogynous hermaphrodite will result in skewed sex ratios. Thus, its protogynous trait makes this species more susceptible to adverse effects of fishing.

There are a multitude of biological reasons for the Warsaw Grouper’s high susceptibility to overfishing, given that it is targeted by fishers and killed as bycatch, and that fishers can be particularly successful at killing groups of spawning Grouper. NMFS considers these factors as a threat to the species (NMFS 2010).

The Grouper may also suffer from small populations of adults, which NMFS should consider in the course of a status review for the species. The U.S. Fish and Wildlife Service (FWS) has routinely recognized that small population size increases the likelihood of extinction.<sup>5</sup> For the Langford’s tree snail (*Partula langfordi*), FWS states:

Even if the threats responsible for the decline of this species were controlled, the persistence of existing populations is hampered by the limited number of known individuals of this species. This circumstance makes the species more

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<sup>5</sup>See, e.g., FWS candidate assessment forms for *Doryopteris takeuchii*, *Huperzia stemmermanniae*, *Megalagrion nesiotis*, *Melicope degeneri*, *Melicope hiiakae*, *Myrsine mezii*, *Ostodes strigatus*, *Partula langfordi*, *Peperomia subpetiolata*, *Phyllostegia bracteata*, and *Tryonia circumstriata*. Accessible via FWS website at <http://www.fws.gov/endangered/wildlife.html> [Accessed November 2009].

vulnerable to extinction due to a variety of natural processes. Small populations are particularly vulnerable to reduced reproductive vigor caused by inbreeding depression, and they may suffer a loss of genetic variability over time due to random genetic drift, resulting in decreased evolutionary potential and ability to cope with environmental change (Lande 1988; Pimm et al. 1988; Center for Conservation Update 1994; Mangel and Tier 1994).<sup>6</sup>

Here FWS relies on citations not specific to *Partula langfordi* that indicate the threat to survival presented by limited population numbers even without other known threats. The agency similarly notes for a snail called Sisi (*Ostodes strigatus*), “Even if the threats responsible for the decline of this species were controlled, the persistence of existing populations is hampered by the small number of extant populations and the small geographic range of the known populations.”<sup>7</sup>

*Human population growth.* Human population growth within its range is a threat to the Warsaw Grouper. Stallings (2009) has documented that as human population densities increase, there is a resultant decline or extirpation of large predatory fish such as groupers. NOAA has described the threat of growing human populations to near shore marine ecosystems:

As the global population continues to increase and demographic shifts toward coastal areas persist, even greater pressures will be placed on nearshore resources to satisfy human desires for food, culture, tourism, recreation and profit (Waddell and Clarke 2008: 8).

A World Wildlife Fund report similarly states,

Nearly 40 per cent of the global population now lives within 100 kilometers of a coast, and many of these people depend on the productivity of the sea. As coastal populations soar, pressure on marine resources has become unsustainable in many places.<sup>8</sup>

Dulvy et al. (2003: 26) write:

...more than half of the world’s human population lives within the coastal zone and depends on fish for the bulk of their protein intake. This proportion could reach 75% by the year 2020...

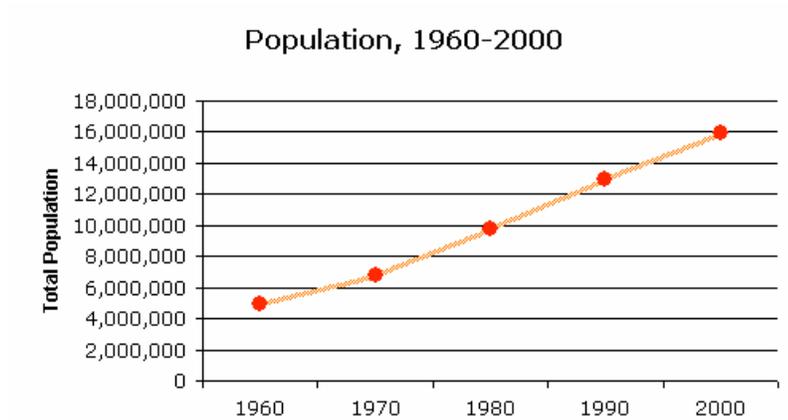
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<sup>6</sup>See 2009 Listing Form for *Partula langfordi* at: [http://ecos.fws.gov/docs/candforms\\_pdf/r1/G0AI\\_I01.pdf](http://ecos.fws.gov/docs/candforms_pdf/r1/G0AI_I01.pdf) [Accessed November 2009] at p. 5.

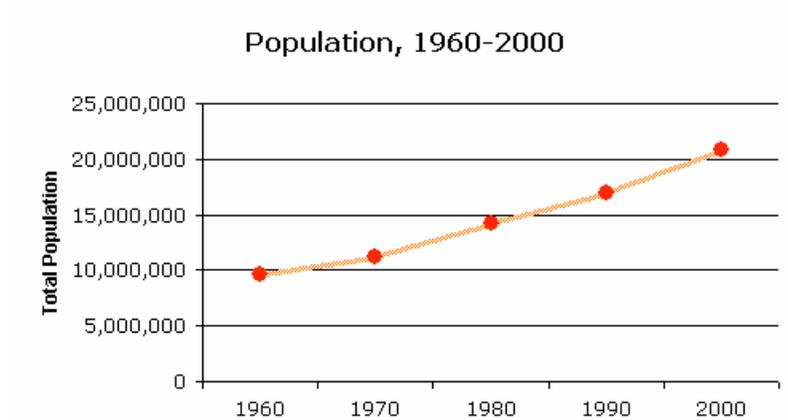
<sup>7</sup>See 2009 Listing Form for *Ostodes strigatus* at: [http://ecos.fws.gov/docs/candforms\\_pdf/r1/G0A5\\_I01.pdf](http://ecos.fws.gov/docs/candforms_pdf/r1/G0A5_I01.pdf) [Accessed November 2009] at p. 4.

<sup>8</sup>See World Wildlife Fund report, “Marine protected areas: providing a future for fish and people.” Online at: <http://assets.panda.org/downloads/marineprotectedareas.pdf> [Accessed November 2009]. This report was focused on the role of Marine Protected Areas in safeguarding marine biodiversity and sustaining fisheries.

The U.S. has a higher human population growth rate than almost every other developed country (United Nations 2007). Moreover, some of the coastal states in whose waters the Warsaw Grouper is found have experienced exponential human population increases. For example, Florida's and Texas's populations has skyrocketed (Figures 6-7).



**Figure 6: Human Population Growth in Florida.** Source: [http://www.censusscope.org/us/s12/chart\\_popl.html](http://www.censusscope.org/us/s12/chart_popl.html) [Accessed February 2010].



**Figure 7: Human Population Growth in Texas.** Source: [http://www.censusscope.org/us/s48/chart\\_popl.html](http://www.censusscope.org/us/s48/chart_popl.html) [Accessed February 2010].

NMFS should therefore consider human population growth as a threat to the Warsaw Grouper.

*Cumulative Impacts.* The Warsaw Grouper is threatened by multiple factors. The overutilization pressure, driven by human population increases and lack of adequate fishing restrictions, combined with late maturity and other biological constraints should be considered a cumulative threat to this species. NMFS should assess the synergistic effects of multiple factors in a formal status review for this species.

### **Value of ESA Listing**

Most Warsaw Groupers likely occur in U.S. waters (Chuen and Huntsman 2006). In addition, the species occurs in foreign waters. Federal listing of this species under the ESA would help ensure (for example):

- Adequate habitat protections, restrictions on take, recovery planning, and funding for this species in U.S. waters;
- Prohibition on take of this species within U.S. waters;
- Prohibition on import, export, or possession of this species by U.S. individuals and corporations; and
- Consultation by U.S. agencies on federal permitting or funding of activities by U.S. and foreign entities that may jeopardize this species.

Moreover, NOAA has previously recognized that ESA protections for Elkhorn (*Acropora palmata*) and Staghorn Coral (*A. cervicornis*) would benefit these species even though the majority of their ranges existing in other countries: through the recovery planning process, the U.S. can encourage international conservation measures (Clarke et al. 2008). Similar logic applies to the Warsaw Grouper.

### **Summary**

The Warsaw Grouper merits listing as an Endangered or Threatened species under the Endangered Species Act. The species faces threats from historic and continued overfishing, as well as slow maturity and other biological constraints that hinder its recovery. The threat from fishing is driven by human population increases. It does not enjoy regulatory protections sufficient to address the threats it faces.

The Warsaw Grouper's range is extensive, occurring along the coasts of North and South America in the Western Atlantic Ocean, but it is increasingly rare within this range. This petition is submitted with the hope that federal protection will be granted and will prevent this species' extinction. We believe ESA listing is vital to preserving and recovering the Warsaw Grouper.

### **Requested Designation**

WildEarth Guardians hereby petitions the National Marine Fisheries Service within the U.S. Department of Commerce and the U.S. Fish and Wildlife Service within the Department of Interior to list the Warsaw Grouper (*Epinephelus nigritus*) as an Endangered or Threatened species pursuant to the Endangered Species Act. This listing action is warranted, given the threats this species faces, as well as its decline in numbers. The Warsaw Grouper is threatened by at least three listing factors: overutilization; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence. ESA listing will permit the development of protective regulations outside the scope of its present designation by NMFS as a species of concern.

**Critical habitat**

Petitioner requests that critical habitat be designated for this species concurrent with final ESA listing.

References

American Fisheries Society. Undated. AFS Policy Statement #31c: Long-lived Reef Fishes: The Grouper-Snapper Complex. **Attachment 1**

Camhi, M., Fowler, S.L., Musick, J.A., Bräutigam, A. and Fordham, S.V. 1998. Sharks and their Relatives – Ecology and Conservation. IUCN/SSC Shark Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK. iv + 39 pp. Online at: <http://data.iucn.org/dbtw-wpd/edocs/SSC-OP-020.pdf> [Accessed January 2010]. **Attachment 2**

Chuen, N.G. and Huntsman, G. 2006. *Epinephelus nigritus*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Downloaded on 06 September 2009. **Attachment 3**

Dulvy, N., Sadovy, Y., and J. Reynolds. 2003. Extinction vulnerability in marine populations. *Fish and Fisheries* 4: 25-64. Online at: [http://www.botany.hawaii.edu/faculty/cunningham/CunninghamCourse/Dulvy\\_et\\_al\\_FF\\_03.pdf](http://www.botany.hawaii.edu/faculty/cunningham/CunninghamCourse/Dulvy_et_al_FF_03.pdf) [Accessed November 2009]. **Attachment 4**

Fishbase. 2010. Fishbase.org Species Account for *Epinephelus nigritus*. Online at: <http://www.fishbase.org/summary/speciessummary.php?id=1207#> [Accessed February 2010]. **Attachment 5**

Koenig, C.C., Coleman, F.C., Grimes, C.B., Fitzhugh, G.R., Scanlon, K.M., Gledhill, C.T., and M. Grace. 2000. Protection of fish spawning habitat for the conservation of warm-temperature reef-fish fisheries of shelf-edge reefs of Florida. *Bulletin of Marine Science* 66(3): 593-616. **Attachment 6**

Morris, A.V., Roberts, C.M. and J.P. Hawkins. 2000. The threatened status of groupers (Epinephelinae). *Biodiversity and Conservation* 9: 919-942. **Attachment 7**

National Marine Fisheries Service. 1999. Endangered and Threatened Species; Revision of Candidate Species List Under the Endangered Species Act. 64 Fed. Reg. 33466-68 (June 23, 1999). **Attachment 8**

National Marine Fisheries Service. 2010. Species of Concern Account for Warsaw Grouper (*Epinephelus nigritus*). Online at: [http://www.nmfs.noaa.gov/pr/pdfs/species/warsawgrouper\\_detailed.pdf](http://www.nmfs.noaa.gov/pr/pdfs/species/warsawgrouper_detailed.pdf) [Accessed February 2010]. **Attachment 9**

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Species Account for *Epinephelus nigritus*. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer> [Accessed February 2010]. **Attachment 10**

Parker, R.O. Jr. and R.W. Mays. 1998. Southeastern U.S. Deepwater Reef Fish Assemblages, Habitat Characteristics, Catches, and Life History Summaries. NOAA Technical Report NMFS 138. September 1998. **Attachment 11**

Rudershausen, R.J., Williams, E.H., Buckel, J.A., Potts, J.C. and C.S. Manooch. 2008. Comparison of Reef Fish Catch per Unit Effort and Total Mortality between the 1970s and 2005–2006 in Onslow Bay, North Carolina. Transactions of the American Fisheries Society 137: 1389–1405. **Attachment 12**

Stallings, C.D. 2009. Fishery-Independent Data Reveal Negative Effect of Human Population Density on Caribbean Predatory Fish Communities. PLOS One 4(5): 1-9. **Attachment 13**

United Nations, Department of Economic and Social Affairs, Population Division. 2007. World Fertility Patterns 2007. Included as an attachment to WildEarth Guardians (2009), see entry below.

Waddell, J.E. and A.M. Clarke (eds.), 2008. The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2008. NOAA Technical Memorandum NOS NCCOS 73. NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team. Silver Spring, MD. 569 pp. Online at: <http://ccma.nos.noaa.gov/stateofthereefs> [Accessed November 2009]. Included as an attachment to WildEarth Guardians (2009), see entry below.

WildEarth Guardians. 2009. Petition (with attachments) to list the Bumphead Parrotfish (*Bolbometopon muricatum*) under the Endangered Species Act. Petition Submitted to U.S. Fish and Wildlife Service and National Marine Fisheries Service on December 31, 2009. **Attachment 14**