

**PETITION TO LIST
The Texas Pipefish (*Syngnathus affinis*)
UNDER THE U.S. ENDANGERED SPECIES ACT**

SPECIES FEARED EXTINCT

NO PHOTO AVAILABLE

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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PETITION PREPARED BY ROBERT HALL III

Introduction

The Texas Pipefish (*Syngnathus affinis*) may be among the rarest creatures in the Gulf of Mexico. Even worse: some researchers warn that it could already be extinct (Roberts and Hawkins 1999; Tolan 2008). Yet, despite its acknowledged rarity, this species is not yet listed under the Endangered Species Act, and it lacks sufficient regulatory protections to guard against extinction. The loss of this species would be a tragedy, indeed, for its own inherent value and also because of its fascinating trait of male pregnancy. Aristotle was the first scientist to write of syngnathid fish reproduction (Frias-Torres 2004). The female deposits eggs in a male's brood pouch, which the male then protects, nurtures, and carries to term.

Accordingly, 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 Interior, acting through the U.S. Fish and Wildlife Service, to list, and thereby protect, the Texas Pipefish (*Syngnathus affinis*) as an endangered or threatened species under the Endangered Species Act (ESA). WildEarth Guardians further requests NMFS to designate critical habitat for this species concurrently with its listing. In addition, given that researchers fear the species may already be extinct, Petitioner requests emergency listing for this species.

The American Fisheries Society (AFS) considers the Texas Pipefish as a species "vulnerable to extinction," and recommends listing it as "endangered" because of its "general overall rarity, endemic nature, and restricted geographical range" (Musick et al. 2000). NatureServe (2009) describes the global population status of the Texas Pipefish as Critically Imperiled, citing few specimens, rarity, and limited habitat as risk factors.

A recent author (Tolan 2008) raised concerns about whether the Texas Pipefish is distinct from the Gulf Pipefish (*S. scovelli*). Such concerns should be addressed or resolved in the course of an ESA status review. Previous researchers have long considered the Texas Pipefish a valid taxon, whether as a subspecies of *S. fuscus* or the full species *S. affinis*.

The primary threat to Texas Pipefish arises from habitat loss and degradation caused by human activities and development along the coast of eastern Texas. Coastal development, including dredging activities, has led to a decline or modification in many of the seagrass beds lining the eastern coast of Texas, vital habitat for this species (Pulich et al. 1997). Pollution, including from both near- and off-shore oil drilling, may pose an additional threat.

Prompt listing of this species and protection of its critical habitat under the ESA is its last best hope for continued survival.

Applicability of the Endangered Species Act

In light of the Pipefish's imperilment, Petitioner requests listing of this species under the ESA as either threatened or endangered, throughout its historic and current range. Taxa eligible for ESA listing include "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature" (16 U.S.C. §

1532(16)).¹ Both the statute (16 U.S.C. § 1532) and regulations implementing the Endangered Species Act (50 C.F.R. § 424) are applicable to this petition. Subsections that concern the formal listing of the Pipefish as an Endangered or Threatened species are:

“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* 16 U.S.C § 1532(6), 50 C.F.R. § 424.02(e).

“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), 50 C.F.R. § 424.02(m).

This Petition demonstrates that the Pipefish is imperiled to the extent that it warrants listing as either Endangered or Threatened under the ESA.

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 ESA Section 4 (16 U.S.C. § 1533(a)(1)) and in 50 C.F.R. § 424.11(c) have resulted in the continued decline of the Texas Pipefish and are causing this species to face extinction or endangerment in the foreseeable future. The Texas Pipefish is presently faced with current and threatened habitat destruction in the form of seagrass bed degradation and pollution. Additionally, there are no existing regulatory mechanisms in place to ensure this species’ survival. Lastly, this fish is likely subject to a greater risk of extinction due to its small population, reproductive selectivity, and increased human population growth along the Gulf Coast. A taxon needs to meet only one of the listing factors outlined in the ESA to qualify for federal listing.

Request for Emergency Listing

Because of the possibility that the species is nearly extinct, WildEarth Guardians requests emergency listing. The ESA gives the Secretaries the power to list species on an emergency basis. 16 U.S.C. § 1533(b)(7). Based on information in this petition, it is clear that there will be “significant risk to the well being” of the Texas Pipefish if it is not immediately listed under the

¹The sole exclusion is for “a species of the Class Insecta determined by the Secretary to constitute a pest whose protection... would present an overwhelming and overriding risk to man.” 16 U.S.C. § 1532(6). It is difficult to imagine an insect so imperiled as to warrant ESA protection that presents a grave risk to humans.

ESA. See 16 U.S.C. § 1533(b)(3)(C)(iii).

Description of Petitioner

WildEarth Guardians is a non-profit environmental organization with over 4,500 members throughout the United States. WildEarth Guardians has an active endangered species protection campaign. As part of this campaign, Guardians works to obtain ESA protection for a wide variety of imperiled wildlife and plants and the ecosystems on which they depend.

Classification and Nomenclature

Common Name: *Syngnathus affinis* is commonly known as the Texas Pipefish (NatureServe 1995). Throughout the petition, we refer to this species as the Texas Pipefish.

Taxonomy: The petitioned species is *Syngnathus affinis* (Günter 1870). Formerly regarded as a subspecies of *S. fuscus*, it was elevated to full species status by Dawson and Vari (1982). The taxonomic classification for this species is shown in Table 1.

Table 1. Taxonomy of *Syngnathus affinis*.

Phylum	Craniata
Class	Actinopterygil
Order	Gasterosteiformes
Family	Syngnathidae
Genus	<i>Syngnathus</i>
Species	<i>Syngnathus affinis</i>

While the Texas Pipefish has been recognized by researchers as taxonomically valid, Tolan (2008) questioned whether *Syngnathus affinis* is distinct from *S. scovelli*. However, he explicitly recommended a broader study to resolve the issue:

Before invalidating *S. affinis* as a nominal taxon, extensive field work must be conducted in the western Gulf of Mexico to document that there is indeed only a single specimen of short-snouted *Syngnathus* within the area. These collections should undoubtedly encompass a much greater temporal scale than the six months used for this study.

Petitioner is concerned that, without federal attention, adequate resources will likely not be provided to conduct this taxonomic research. In the meantime, this species may very well go extinct.

Description

Members of the Syngnathidae family or “syngnathids” include pipefishes, seahorses, and seadragons. Members of this family are mostly marine, but can also be found in fresh or brackish waters. They are usually limited to shallow water. They feed on tiny invertebrates,

which are sucked into their tubular snout (Nelson 1994; Browne et al. 2008). State Browne et al. (2008: 162): “The name ‘syngnathid’ refers to these unique fishes’ jaws, which are united into a tube-shaped snout with a tiny mouth at the end.”

Generally, Pipefish are 4 to 5 inches long and resemble a stretched-out seahorse (Paczolt and Jones 2010). The Texas Pipefish is a very slender fish, characterized by a moderately short snout length. As previously stated, the Texas Pipefish was considered to be a subspecies of the *S. fuscus* until 1982, when *Syngnathus affinis* was distinguished by Dawson due to its moderate snout length and depth, in addition to a more narrow preorbital bone (Tolan 2008; NatureServe 2009).

Geographic Distribution: Historic and Current

Nearly all occurrences of the Texas Pipefish have come from the Corpus Christi Bay area of Texas, with the remaining collections coming from Prien Lake in Louisiana, and a single specimen recorded in the Laguna de Términos area (Tolan 2008). NatureServe (2009) describes this species’ range as the Gulf Coast of Texas, Mexico, from Corpus Christi Bay south to Campeche. Roberts and Hawkins (1999) describe its range as southeastern Texas, and possibly extending to Louisiana and Mexico.

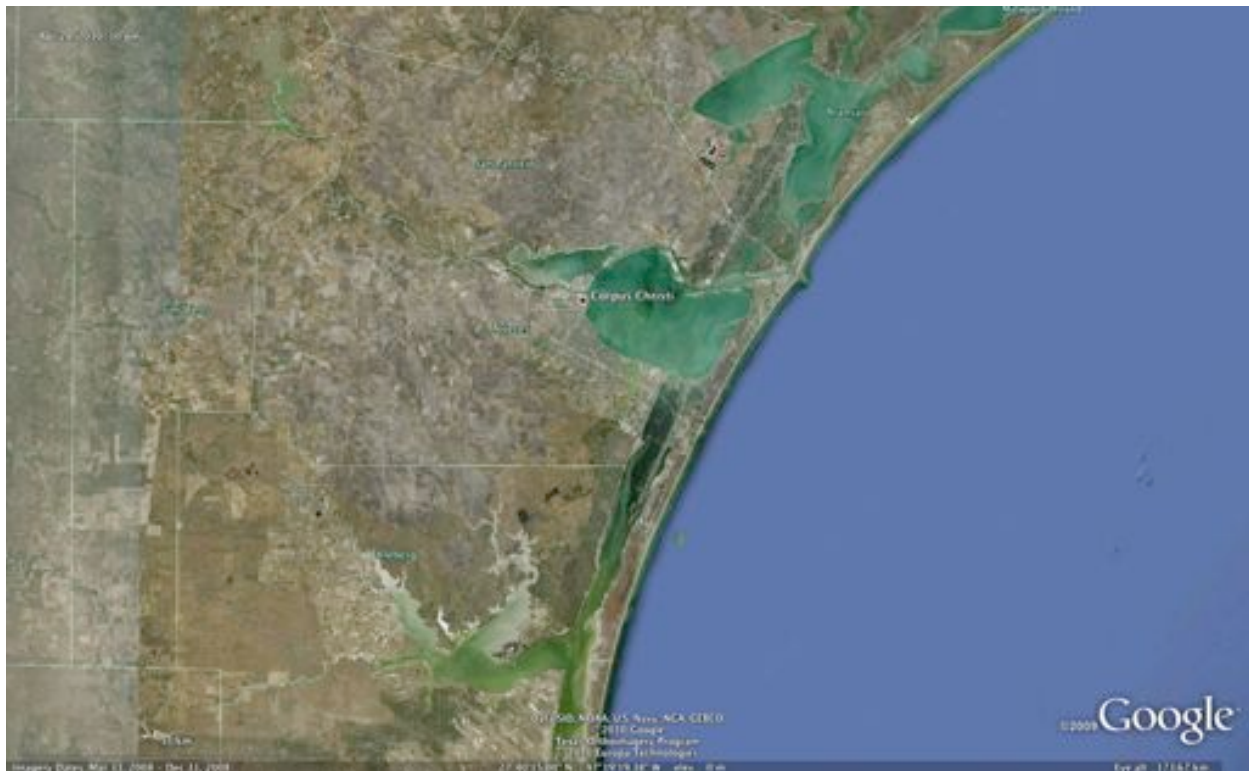


Figure 1: Aerial View of Corpus Christi Bay.
(Created in Google Earth).

In an ANOSIM (analysis of similarity) study of the Texas Pipefish (*Syngnathus affinis*) and Gulf Pipefish (*S. scovelli*), researchers uncovered several more existing museum specimens of the

Texas Pipefish, harvested around the northern Gulf of Mexico (in Galveston, Texas, the Upper Laguna Madre in Texas, and Edgemont Key in Florida) (Tolan 2008). NatureServe (2009) reports two known populations in Texas and Mexico.

Habitat Requirements

It is presumed by most researchers that the Texas Pipefish shares similar habitat (shallow, nearshore, submerged aquatic vegetation) as *S. scovelli* (the Gulf Pipefish) (Tolan 2008). Available information suggests that the major habitats for this species are shallow seagrass beds lining the Texas Coast and Gulf of Mexico. NatureServe (2009) describes the species' habitat as “[s]tands of seagrass in shallow bays and passes.” Recently, this species' habitat has been in rapid decline because of human activities on the coast.

Life History

Because of the Texas Pipefish's rarity and small number of collected specimens, little is known about its specific biological requirements. Of special note, however, are the reproductive traits of pipefish. The Texas Pipefish is thought to produce only a few hundred offspring at each reproduction (Roberts and Hawkins 1999). Browne et al. (2008: 167) estimate the number of eggs a male pipefish can carry at 20-200. The hatching period is approximately 20-40 days. *Id.*

Humans have remarked on syngnathid reproduction for more than a millennium. Frias-Torres (2004: 73) wrote:

In 350 BC, Aristotle was the first scientist to describe the process of brood release in Syngnathidae, probably *Syngnathus acus*, a common pipefish with a pouch covered by a fleshy membrane found in inshore coastal areas of the Mediterranean Sea:

“When the time of parturition arrives, [the pipefish] bursts in two, and the eggs escape out (...) the fish has a diaphysis or cloven growth under the belly and abdomen, and after it has spawned by the splitting of this diaphysis, the sides of the split grow together again. (...) The young fish cluster round the parent (...) for the fish spawns onto herself; and if any one touch the young, they swim away.”

Most fascinating, pipefishes, like other syngnathid fishes, have a unique reproductive system in which the male carries developing embryos and gives birth (Harlin-Cognato et al. 2006; Paczolt and Jones 2010). Pipefish, however, are very sexually selective. A recent study has shown that male pipefish tend to abort their brood (offspring) in the middle of the gestation period, when they deem their mate to be unattractive (or small). They then absorb the offsprings' nutrients for themselves and prepare for more offspring from a more “attractive” (or larger) mate. This dynamic lengthens the time in which it takes the species to reproduce. However, larger females transferred more eggs to males and embryos from larger females had greater survivorship. *Id.* Syngnathid hatchlings are miniature versions of their parents and begin swimming and feeding immediately after males expel them from their brood pouch (Browne et al. 2008 at p. 167).

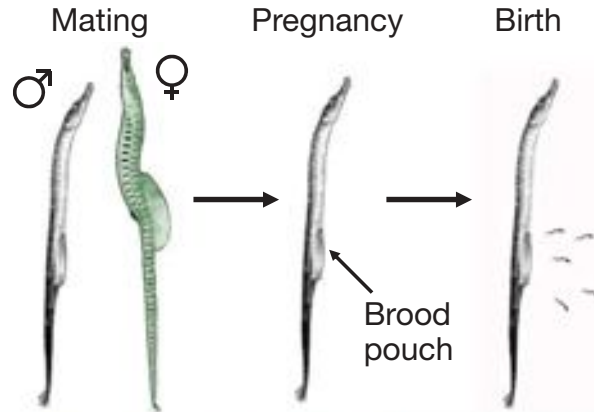


Figure 2: Male Pregnancy in Pipefishes (Gulf Pipefish Pictured Here).
Source: Paczolt and Jones (2010).

Syngnathids are not adapted for rapid swimming and generally avoid predation through camouflage (mimicking seagrass or algae) or by seeking shelter. Due to this predator-avoidance behavior, syngnathids have evolved into diverse (and fascinating) body forms (Browne et al. 2008). Roberts and Hawkins (1999) suggest that the Texas Pipefish's limited dispersal ability may make it more vulnerable to extinction (Roberts and Hawkins 1999).

Historic and Current Population Status and Trends

Because few specimens have been reported since 1977, this species is currently described as among the rarest in the Gulf of Mexico and perhaps extinct (Roberts and Hawkins 1999). NatureServe (2009) considers the Texas Pipefish Critically Imperiled (at a very high risk of extinction) across its entire range due to its limited populations and limited habitat. The International Union for Conservation of Nature (IUCN) reports that it may be extinct due to habitat loss (Roberts et al. 1998).

According to Tolan (2008), a total of 36 specimens of the Texas Pipefish have been reported since 1926 (not including the museum specimens discovered in the ANOSIM study mentioned above), and there have been no new collections recorded in over 30 years. The vast majority (30 out of 36) of these occurrences were recorded in the Corpus Christi Bay area of Texas. NatureServe (2009) reports an even smaller number of global occurrences, with only a total of 26 known specimens from 2-3 sites.

Additionally, AFS (2000) considers the Texas Pipefish at high risk of extinction due to the fish's rarity, restricted range, and habitat degradation. AFS considers the Texas Pipefish's population as Endangered (Musick et al. 2000). This species is considered vulnerable to global extinction. *Id.* Most recently, the above-mentioned ANOSIM study yielded a total of 170 pipefish between June 2005 and November 2005 from the Corpus Christi Bay area (the main historical habitat for the Texas Pipefish) (Tolan 2008). Of the 170 specimens collected, none were *Syngnathus affinis*. *Id.* The best available evidence shows that this species is imperiled and on the brink of extinction.

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

The Texas Pipefish 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.**

Habitat decline and degradation are present as a result of human activities and changes in water temperature (Factor A). There are currently no specific regulatory mechanisms protecting the Texas Pipefish (Factor D). The rarity and small population of this species increases its chance of extinction (Factor E). A driver of the present and threatened habitat destruction is human population growth (Factor E).

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

The IUCN reports that this species could be extinct due to habitat loss (Roberts et al. 1998). Roberts and Hawkins (1999: 242) stated more than a decade ago that, “its habitat has recently been in rapid decline because of human activities at the coast.” Reasons for the Texas Pipefish’s disappearance related to habitat include destruction of submerged aquatic vegetation and dredging activities along the coast (Roberts and Hawkins 1999; Musick et al. 2000). As seagrass beds are considered to be a major habitat for the Texas Pipefish (Tolan 2008; NatureServe 2009), NMFS should consider seagrass degradation as a threat to this species’ survival.



Figure 3: Propeller Scars Cut Across Seagrass Meadows in Corpus Christi.

Source: The Nature Conservancy

<http://www.nature.org/wherewework/northamerica/states/texas/news/news2934.html>

[Accessed July 2010].

A study performed by the Corpus Christi Bay National Estuary Program (CCBNEP), describes the current status of and threats to seagrass beds in the region. While the seagrass system appears to be fairly stable in the region over the last 40 years, there have been changes in seagrass bed distribution, and “hot spots” of seagrass impact and loss along the coast, indicating that certain systems may be at a stage where seagrass is declining (Pulich & White 1997). These declines could be attributed to shoreline development causing an increase in nutrients being released into the water. The increase in nutrients has led to clouding of the water, thereby causing lower water temperatures and less light for photosynthesis. *Id.* CCBNEP also list natural events such as hurricanes and other climatic events as impacting seagrass beds. *Id.* Additionally, shallow water seagrass beds have been disturbed by waterway navigation and motorboat propeller scarring. *Id.*

An extensive network of navigation channels, lined with discharge dredged material, has altered natural environments and locally impacted seagrass habitats in Corpus Christi Bay. *Id.* Similarly, in the nearby Upper Laguna Madre System, the persistent brown tide is having a serious detrimental effect on seagrass beds in the lagoon. *Id.* In Galveston Bay on the upper Texas Coast, nearly all seagrass beds have been gone from the system since the late 1970s. *Id.*

With the recent Deepwater Horizon spill looming in the minds of many Americans, it is important to realize the threats an oil spill brings to the seagrass habitats of the Texas Pipefish. An oil spill can cause extensive mortality throughout the marine ecosystem from the basic foundations of phytoplankton, algae, coral and seagrass to the largest and most mobile organisms.² Although the most recent oil spill is not projected to reach the eastern coast of Texas, America’s continued reliance on oil as an energy resource will most likely lead to continued drilling in the region. An oil spill within the Pipefish’s range could completely eliminate this narrowly distributed fish.

Dr. Richard E. Dodge, Professor and Dean at Nova Southeastern University Oceanographic Center and Executive Director of the National Coral Reef Institute, describes the disastrous effects an oil spill could have on seagrass beds and their inhabitants:

... we would expect loss of seagrass only in places that oil were pushed in to intertidal areas and stranded for extended periods at low tide. [However] oil contains many toxic compounds that could kill most of the important animals that reside in the seagrass beds.³

Browne et al. (2008: 173) note that nearshore habitat requirements of pipefishes make them more vulnerable to runoff and pollutants. In a report for NMFS, Sindermann (1994) discussed the effects of pollutants on coastal fishes and how pollution of estuaries and coastal waters has been correlated with increased human population density and industrialization.

²See [An introduction to marine oil spills](http://www.wec.ufl.edu/Introduction%20to%20Marine%20oil%20spills.pdf), James Perran Ross, Dept. Wildlife Ecology and Conservation IFAS, University of Florida. 2010. (emphasis added). Online at: <http://www.wec.ufl.edu/Introduction%20to%20Marine%20oil%20spills.pdf> [Accessed July 2010].

³See [Oil Spill’s Effect On Wildlife](http://greenamonggray.blogspot.com/2010/05/oil-spills-effect-on-wildlife.html), Kyle Scribner 2010. Available online at <http://greenamonggray.blogspot.com/2010/05/oil-spills-effect-on-wildlife.html> [Accessed August 2010].

Evidence clearly shows that the seagrass habitats of the Texas Pipefish are threatened, and the species therefore qualifies for listing under the ESA.

II. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Overutilization for commercial, recreational, scientific, or educational purposes is not known to be a threat to this species, but NMFS should analyze it fully during status review.

III. Disease or Predation

Disease and predation are not known to be threats to this species, but NMFS should analyze these issues fully during status review.

IV. The Inadequacy of Existing Regulatory Mechanisms

There are currently no specific regulatory mechanisms in place to ensure the protection of this critically imperiled and rare species (NatureServe 2009).

V. Other Natural or Manmade Factors Affecting Its Continued Existence

Roberts and Hawkins (1999) suggest that the species' limited dispersal ability may make it more vulnerable to extinction. In addition, several of the factors that these authors point to as sources of endangerment for marine species – e.g., narrow distribution, vulnerability of its habitat to destruction, and rarity – apply to the Texas Pipefish. *Id.* Similarly, in their review of syngnathids, Browne et al. (2008: 173) state: “Species with juveniles that have limited dispersal are vulnerable to local extinction especially if their habitats are fragmented”. This appears to be the case for the Texas Pipefish. Below we review how several biological and anthropogenic factors pose further perils to the petitioned species.

Small population. As discussed above, the Texas Pipefish is characterized by small population size, which NMFS should consider in the course of status review for this species. Musick et al. (2000) consider “rarity” as a factor to determine the species risk of extinction and lists that factor in its rationale for recommending Endangered status for this fish. Furthermore, The U.S. Fish and Wildlife Service (FWS) has routinely recognized that small population size increases the likelihood of extinction.⁴ 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 vulnerable to extinction due to a variety of natural processes. Small populations are particularly vulnerable to reduce reproductive vigor caused by inbreeding depression, and they may suffer a loss of genetic variability over time due to

⁴See, e.g., FWS candidate assessment forms for *Doryopteris takeuchii*, *Huperzia stemmermanniae*, *Melicope hiiakae*, *Ostodes strigatus*, *Partula langfordi*, *Peperomia subpetiolata*, *Phyllostegia bracteata*, and *Tryonia circumstriata*. Accessible via FWS website at <http://www.fws.gov/endangered> [Accessed August 2010].

random genetic drift, resulting in decreased evolutionary and ability to cope with environmental change (Lande 1988; Primm et al. 1988; Center for Conservation Update 1994; Mangel and Tier 1994).⁵

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.⁶

Reproductive traits. While there have been no dispositive findings on the biological vulnerability of the Texas Pipefish due to its limited number of recorded specimens and general rarity, NMFS should consider the Pipefish's reproductive selectivity when completing a status review. The Gulf Pipefish has recently been found to be extremely selective in its reproductive habits (Paczolt and Jones 2010). New research has shown that the pregnant male pipefish will abandon embryos in hopes of finding preferable (larger) mates. *Id.*

Although the effects of the male Pipefish's sexual selectivity on population viability have yet to be studied, the small population of these fish, coupled with the dangers of ever-shrinking habitat, suggest that any hindrance in the normal gestation period could have a disastrous effect on the survival of this species. Therefore, NMFS should consider the Pipefish's reproductive selectivity in its status report of this species.

Human population growth. Human population growth within the range of this fish is a threat to the survival of the species. 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 percent 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

⁵ See 2009 Listing Form for *Partula langfordi* at: http://ecos.fws.gov/docs/candforms_pdf/r1/G0AI_I01.pdf [Accessed July 2010] at p. 5

⁶ See 2009 Listing Form for *Ostodes strigatus* at: http://ecos.fws.gov/docs/candforms_pdf/r1/G0A5_I01.pdf [Accessed July 2010] at p. 4.

populations soar, pressure on marine resources has become unsustainable in many places.⁷

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...⁸

The U.S has a higher population growth than almost every other developed country (United Nations 2007). Moreover, some of the coastal states in whose water this species is found have experienced exponential human population increases. For example, Texas and the Corpus Christi Bay area's populations have risen dramatically. See Figures 4 and 5.

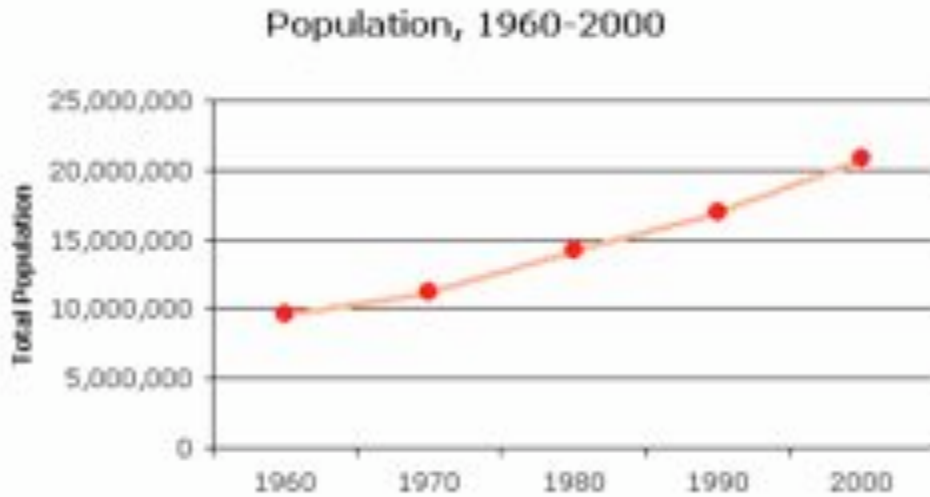


Figure 4: Human Population Growth in Texas.

Source: http://www.censuscope.org/us/s48/chart_popl.html [Accessed July 2010].

⁷See World Wildlife Fund report, "Marine protected areas: Providing a future for fish and people." Online at: <http://assets.panda.org/downloads/marineprotectedareas.pdf> [Accessed June 2010]. This report was focused on the role of Marine Protected Areas in safeguarding marine biodiversity and sustaining fisheries.

⁸See also Roberts and Hawkins (1999: 241).

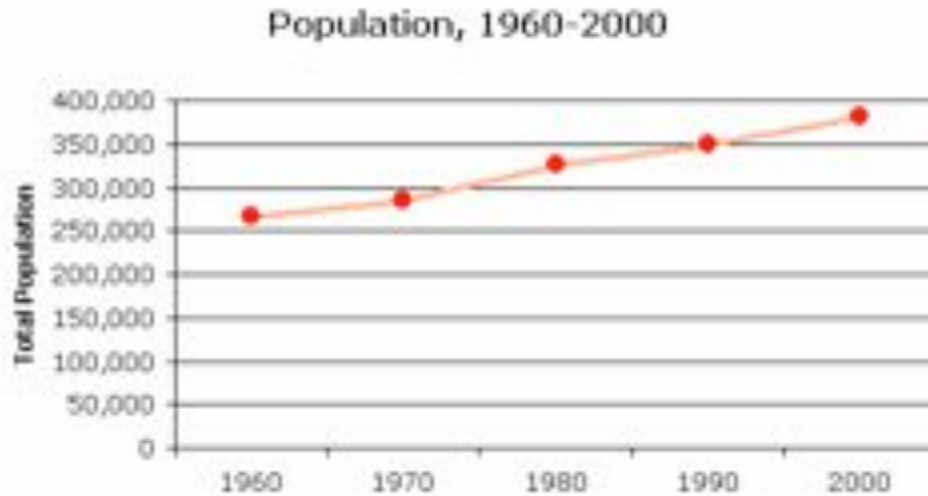


Figure 5: Human Population Growth in Corpus Christi, Texas.

Source: http://www.censusscope.org/us/m1880/chart_popl.html

[Accessed July 2010].

Similarly, as America's demand for oil continues to increase, it is likely that the habitats for the Texas Pipefish will be further invaded by oil rigs, pipelines, and increased traffic, thereby increasing the chance for environmental and ecological disaster, such as the Deepwater Horizon oil spill, further limiting their chance of survival or recovery. NMFS should therefore consider human population growth as a threat to the Texas Pipefish.

NMFS lists the Opossum Pipefish (*Microphis brachyurus lineatus*) as a Species of Concern (71 Fed. Reg. 61022 at p. 61024), and several of the factors NMFS identifies as important for ranking the Opossum Pipefish as a Species of Concern are shared with the Texas Pipefish: habitat destruction, poor swimming ability, and demographic and genetic diversity concerns (NMFS 2010). Of particular relevance, NMFS (2010: 2) described the following situation for the Opossum pipefish:

Nothing is known about absolute population size or annual variation in population size as they are difficult to survey, but the decline in habitat quantity and quality...has likely led to a drastic decrease in population size.

NMFS's precautionary thinking here should also be applied to the Texas Pipefish. What is known about the Texas Pipefish's population size is that it either has extremely small populations or may be extinct. The Texas Pipefish should therefore be promptly listed under the ESA.

Fishing and shrimping. Musick et al. (2000) describe these factors as threats to this species. The effect of these activities should be investigated by NMFS in a status review for the Texas Pipefish.

Value of ESA Listing

Currently, there is no protection afforded to this species despite its critical imperilment and many risk factors (NatureServe 2009). Federal listing of this species under the ESA is essential for the Texas Pipefish's survival and 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.

Summary

The Texas Pipefish merits listing as an Endangered or Threatened species under the Endangered Species Act (ESA). The species faces threats from habitat destruction and degradation as a result of human activities along the coast, as well as a lack of regulatory mechanisms to ensure this species' survival. The threat from habitat destruction is driven by human population increases. Additional pressures are this fish's small population size, restricted range, and perhaps its reproductive habits.

The Texas Pipefish is considered to be among the rarest in the Gulf of Mexico, yielding only 36 specimens, with 30 coming from the same Corpus Christi location. No specimens have been recorded in nearly 30 years. A researcher (Tolan 2008) recently raised concerns about the taxonomic validity of this species but recommended further research to resolve the issue. This petition is compatible with that recommendation for additional research. However, the Texas Pipefish has long been recognized as a valid taxon (either as a subspecies or full species) and prompt action is necessary to avoid its extinction. 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 Texas Pipefish.

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 Texas Pipefish as Endangered or Threatened species pursuant to the Endangered Species Act. These listing actions are warranted, given the threats this species faces, as well as its decline in numbers. The Texas Pipefish is threatened by at least three listing factors: habitat destruction; the inadequacy of existing regulatory mechanisms; and other natural or manmade factors affecting its continued existence. ESA listing will permit the development of proactive regulations, including a plan for this fish's recovery. Moreover, Petitioner requests emergency listing of the species to take effect immediately and last for 240 days, while the standard listing process is initiated.

Critical Habitat

Petitioner requests that critical habitat be designated for the Texas Pipefish concurrent with final ESA listing. Such critical habitat for this species should include areas in the Gulf of Mexico and the Corpus Christi Bay area of Texas. The constituent elements should include, but not be limited to, seagrass beds along the Gulf of Mexico and the eastern coast of Texas.

If NMFS fails to provide critical habitats for the Texas Pipefish, it will deprive this species from one of the ESA's key protections. The legislative history of the ESA is evidence of Congressional understanding of the importance of designating critical habitats to endangered or threatened species:

It is the committee's view that classifying a species as endangered or threatened is only the first step in insuring its survival. *Of equal or more importance is the determination of the habitat necessary for the species' continued existence.* Once a habitat is so designated, the Act requires that proposed Federal Actions not adversely affect the habitat. If the protection of endangered and threatened species depends in large measure of the species' habitat, *then the ultimate effectiveness of the Endangered Species Act will depend on the designation of critical habitats.*

H.R. Rep. No. 94-887, at 3 (1976), cited (with emphasis) in *Center for Biological Diversity v. Norton*, 240 F.Supp.2d at 1090.

The primary conservation benefit of critical habitat designation is that it provides a separate basis, in addition to species listing, for federal agencies to consult under Section 7, 16 U.S.C. § 1536(a)(2), with NMFS regarding actions they perform or permit. If a federal action threatens to destroy or adversely modify a species' critical habitat, consultation must occur even if the action will not jeopardize the continued existence of the species. 16 U.S.C. § 1536(a)(2). However, without critical habitat designation, this consultation requirement "becomes unenforceable." *Forest Guardians v. Babbitt*, 174 F.3d 1178, 1185-86 (10th Cir. 1999).

It is on these grounds that we also request critical habitat designation, in addition to ESA listing, for the Texas Pipefish.

References:

- Browne, R.K., Baker, J.L., and Connolly, R.M. 2008. Syngnathids: sea dragons, seahorses, and pipefish of Gulf St. Vincent. Chapter 13 in Shepherd, S., Bryars, S., Kirkegaard, I., Harbison, P., and J.T. Jennings, Eds. Natural History of Gulf St. Vincent. Royal Society of South Australia, Inc., South Australia. **Attachment 1**
- Dulvy, N., Sadovy, Y., and 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 [Accessed June 2010]. **Attachment 2**
- Frias-Torres, S. 2004. Notes on aquarium brood release and feeding of the opossum pipefish (*Microphis brachyurus lineatus*). Gulf and Caribbean Research 16: 73-75. **Attachment 3**
- Harlin-Cognato, A., Hoffman, E.A., and A.G. Jones. 2006. Gene cooption without duplication during the evolution of a male-pregnancy gene in pipefish. Proceedings of the National Academy of Sciences 103(51): 19407-19412. **Attachment 4**
- Musick, J.A., M.M. Harbin, S.A. Berkeley, G.H. Burgess, A.M. Eklund, L. Findley, R.G. Gilmore, J.T. Golden, D.S. Ha, G.R. Huntsman, J.C. McGovern, S.J. Parker, S.G. Poss, E. Sala, T.W. Schmidt, G.R. Sedberry, H. Weeks and S.G. Wright. 2000. Marine, Estuarine, and Diadromous Fish Stocks at Risk of Extinction in North America (Exclusive and Pacific Salmonids). Fisheries, 25 (11): 6-30. Online at: <http://www.cresli.org/cresli/pdf%20documents/fisheriesnov.pdf> [Accessed July 2010]. **Attachment 5**
- NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Species Account for *Syngnathus affinis*. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer> [Accessed July 2010]. **Attachment 6**
- National Marine Fisheries Service. 2010. Detailed Species of Concern Account for Opossum Pipefish. Online at: http://www.nmfs.noaa.gov/pr/pdfs/species/opossumpipefish_detailed.pdf [Accessed August 2010]. **Attachment 7**
- Nelson, J.S. 1994. Fishes of the world. Third edition. John Wiley & Sons, Inc., New York. 600 p.
- Paczolt, K.A. and A.G. Jones. 2010. Post-Copulatory Sexual Selection and Sexual Conflict in the Evolution of Male Pregnancy. Nature Magazine 464, 401–404 (2010). Online at: <http://www.nature.com/nature/journal/v464/n7287/pdf/nature08861.pdf> [Accessed July 2010]. **Attachment 8**
- Pulich, W., Jr. and W.A. White. 1997. Current status and historical trends of seagrass in the Corpus Christi Bay National Estuary Program area. Corpus Christi Bay National Estuary Program Publication No. 20. Texas Natural Resources Conservation Commission, Austin, Texas 131pp. **Attachment 9**

Roberts, C.M., J.P. Hawkins, N. Chapman, V. Clarke, A.V. Morris, R. Miller and A. Richards. 1998. The threatened status of marine species. A Report to the World Conservation Union (IUCN), Species Survival Commission, and Center for Marine Conservation, Washington, D.C, 10 p.

Roberts, C.M. and J.P. Hawkins. 1999. Extinction risk in the sea. *Trends Ecol. Evol.*, 14(6): 241-246. **Attachment 10**

Sindermann, C.J. 1994. Quantitative effects of pollution on marine and anadromous fish populations. NOAA Technical Memorandum NMFS-F/NEC-104. **Attachment 11**

Tolan, James. 2008. A Reexamination of *Syngnathus affinis* Gunter 1870, with Comparisons to *Syngnathus scovelli* (Evermann and Kendall 1896) (teleostei: Syngnathidae). *The Texas Journal of Science* 60.2 (2008) pp. 83(14). **Attachment 12**

United Nations Department of Economic and Social Affairs, Population Division. 2007. *World Fertility Patterns 2007*. **Attachment 13**

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 June 2010]. **Attachment 14**