Platform Removal Brief

prepared by

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National Environmental Policy Act (NEPA) Analysis of the Removal of Retired Offshore Oil and Gas Platforms

EcoRigs Platform Removal Brief No. 2

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Loggerhead turtles (*Caretta caretta*) are big fans of offshore platforms, these omnivores eat just about everything that lives on the pilings: coral, sponge, algae, sea urchins, crabs, snails, and fish if they can catch them. They rest and sometimes sleep on the subsurface structures.

Abstract

The Gulf of Mexico (GOM) will lose a third of its 3,600 offshore oil and gas platforms in the next 5 years which will destroy an estimated 1,875 acres of coral reef habitat and 7 billion invertebrates, many of which are Federally protected organisms such as scleractinian corals, octocorals, hydrozoans and gorgonians. It is estimated that 49 species of Federally managed fish and 25 species of protected invertebrates utilize, to varying degrees, the platform substrate for feeding, spawning, mating, and growing to maturity. The Federal government is bound by law (Magnuson Act) to protect coral reef organisms and reef communities. If the Federal government acknowledges the ecological significance of oil and gas platform habitat, the cost to produce a barrel of oil in the GOM would increase due to the accrual of environmental compliance expenses. Federal agencies are required to evaluate reasonable alternative actions to blasting oil and gas platforms out of the water and consider avoidance and mitigation of adverse environmental effects. EcoRigs suggested that BOEMRE should consider alternate uses for retired platform such as sustainable fisheries, production of renewable ocean energy derived from wind, current, wave, geo-thermal, salinity gradients, bio-fuels, hydrogen production, (i.e., extraction of hydrogen from seawater via electrolysis), recreational fishing and scuba diving parks, fish sanctuaries, culture of pharmaceutically valuable organisms and sequestration of greenhouse gases. Evaluating these alternate uses could lead to platform preservation, avoid the destruction of the ecosystem and inhabitants, and meet objectives of Federal environmental regulations.

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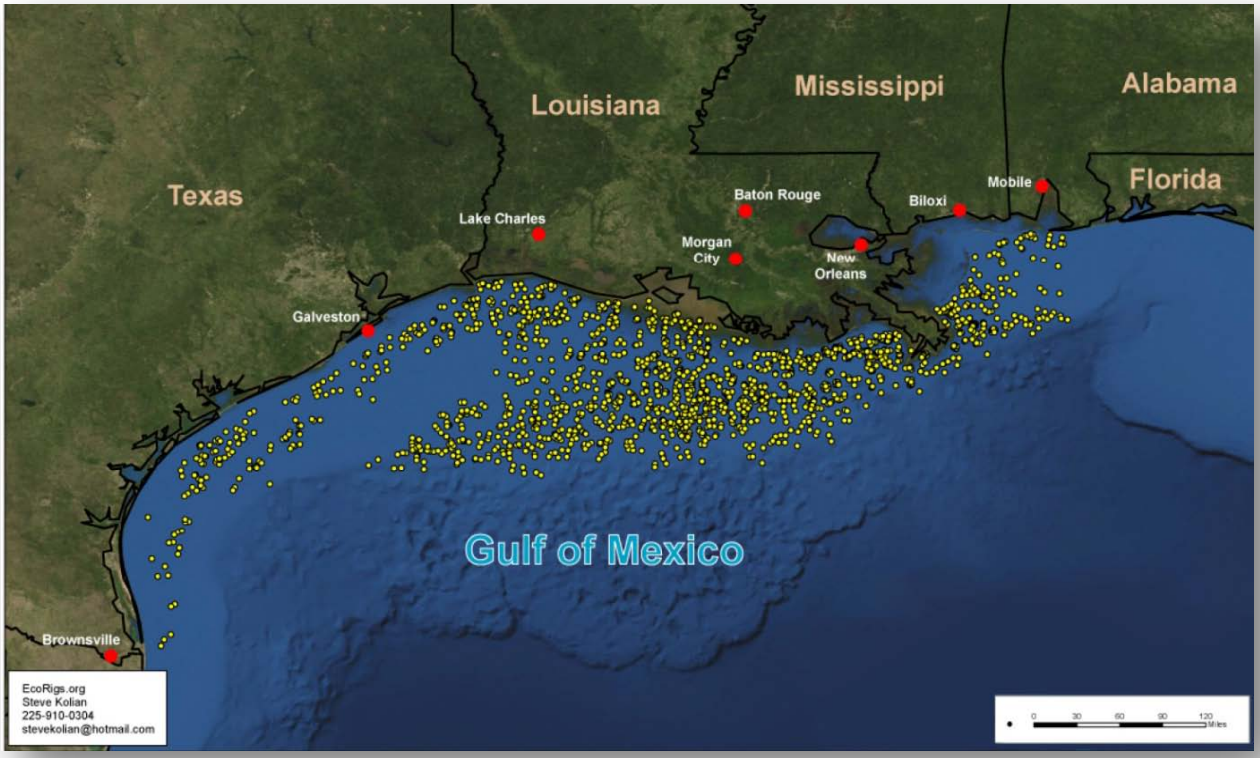
1.0 Introduction

The Gulf of Mexico (GOM) will lose a third of its 3,600 offshore oil and gas platforms in the next 5 years.[1] They create one of the most prolific ecosystems, by area, on the planet. It is estimated that the removal of 1,250 platforms will destroy 1,875 acres of coral reef habitat and 7 billion invertebrates, many of which are Federally protected scleractinian corals, octocorals, hydrozoans and gorgonians. EcoRigs' objective is to encourage enactment of environmental laws to prevent the removal of ecologically important structures and advance methods (Alternate Uses) to pay for long-term maintenance and platform liability insurance. The concept is to use provisions in the Sustainable Fisheries Act/Magnuson-Stevens Fishery Conservation and Management Act ("Magnuson Act", 16 U.S.C.A. § 1801, et seq.), Endangered Species Act ("ESA", 16 U.S.C.A.Ch. 35, et seq.) and National Environmental Policy Act ("NEPA", 42 U.S.C.A. Ch. 55, et seq.) to challenge the execution of Federal regulations (30 CFR 250.1700) that require platforms to be removed one year after the wells shut down. The Federal government is bound by law to protect coral reef organisms and reef communities and consider alternatives to actions that result in the destruction of protected marine organisms.

Figure 1-1. Location of Fixed Platforms in the Gulf of Mexico



The Gulf of Mexico is home to 3,600 offshore oil and gas platforms. To date, over 2,300 have been removed and the pace of platform removals is increasing, another 1,250 platforms ecosystems will be destroyed in the next 5 years.

[1] The sudden surge in platform removals is the result of the BOEMRE "Idle Iron" policy (NTL No. 2010-G05) implemented on Oct.12, 2010. "Idle Iron" refers to an offshore platform that has not produced oil or gas for 1 or more years but remains anchored to the seabed - idle. This new policy will require immediate removal of 650 idle platforms, in addition to the 120 that retire every year, amounting to 650 + (5 x 120) = 1,250 platform removals from the GOM in the next 5 years (Kaiser, personal comm. 2011).

2.0 Platform Removals are a Federal Action Subject to Federal Laws

The offshore platforms are located in Federal waters on Federal mineral leases and managed by the Department of Interior (DOI) Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) [formerly the Minerals Management Service (MMS)]. The Federal government is bound by law to protect coral reef organisms and reef communities and consider alternatives to actions that result in the destruction of protected marine organisms. In other words, when a platform is removed, it is subject to laws that protect marine life and the Federal government is obligated to investigate alternatives to removal. The most relevant Federal laws are the Magnuson Act, ESA, and NEPA.

3.0 Magnuson-Stevens Fishery Conservation and Management Act (Magnuson Act)

The Magnuson Act requires Federal agencies (BOEMRE) to consult with National Oceanic Atmospheric Administration (NOAA) Fisheries on Federal actions that may adversely affect Federally protected species and Essential Fish Habitat (EFH). The Magnuson Act (50 CFR 622.2) states that scleractinian corals, hydrozoans, octocorals and gorgonians are not supposed to be removed from the GOM. These organisms are common on offshore platforms and their mortalities are never reviewed by NOAA Fisheries (MMS 2005).

NOAA Fisheries and the U.S. Coast Guard are responsible for enforcement of the Magnuson Act and should be advising BOEMRE that removing protected coral, hydrozoans and gorgonians from Federal waters is prohibited. In fact, not only does the Magnuson Act prohibit the incidental take of these organisms, it states that if such an occasion cannot be avoided, the organisms must be scraped off the structure and released into the waters they originated from.[2] No evidence has been found that BOEMRE, NOAA Fisheries or the Gulf of Mexico Fisheries Management Council (Gulf Council) have assessed the environmental impact of the mortality of the billions of marine invertebrates in the next 5 years, let alone require that the protected organisms be scraped off the platforms before removal and returned to the surrounding waters.

Cryptic Goliath grouper (*Epinephelus itajara*) are frequent recruits to offshore platforms. Below gorgonians (*Telesto fruticulosa*) and hydroids (*Syncorne eximia*). These organisms are abundant on offshore platforms.

[2] Title 50 CFR 622.32(b)(2).

4.0 National Environmental Policy Act (NEPA)

Hawksbill turtle (*Eretmochelys imbricate*) are common visitors to offshore platforms where they forage, rest and sometimes sleep on the subsurface structures.

NEPA is required for all major Federal actions, and discloses the impacts of the Federal action on the human and natural environment. NEPA also connects Federal laws (Magnuson Act) to Federal actions (platform removal). For example, explosives are used to liberate the platform pilings from the ocean floor which instantly kills thousands of finfish (Gitschlag et al. 2000) and millions of invertebrates. NEPA requires the Federal government to describe the environmental impacts of the use of explosives and platform removal including the mortality of platform invertebrates. The fact that the platform habitat is an artificial structure does not relieve BOEMRE from evaluating the impacts on protected invertebrates from this Federal Action. The laws protect the organisms and their habitat. A number of regulatory precedents exist mandating the preservation of man-made habitats when they are used by Federally protected organisms (Gulf Council 1998; MMS 2005; etc).

Federal agencies are responsible for protecting these marine organisms and their habitat. If there is no way to save them, the Federal government must consider alternatives to the Proposed Action such as using the platform for the production of renewable ocean energy or sustainable fisheries. If these alternatives are not reasonable, then NEPA requires that the responsible party mitigate for the loss of protected organisms and habitat. The responsible party must build or restore habitat equal to the habitat that is destroyed.[3] There is no discussion of mitigation or alternate uses to platform removals in the NEPA documentation, nor is there any discussion of the mortality of billions invertebrates such as corals, gorgonians, octocoral or hydrozoans (DOI MMS 2005).[4] If the Federal laws require the protection of marine invertebrates, the oil and gas industry would have to mitigate for thousands of acres of coral reef habitat scheduled to be removed.

4.1 Alternate Uses of Offshore Platforms NEPA

NEPA obligates the lead Federal agency to evaluate reasonable alternative actions to blasting oil and gas platforms for platform removal and consider avoidance and mitigation of adverse environmental effects. Therefore, the NEPA analysis should examine a range of alternative beneficial uses for retired platforms, which should include alternatives that preserve and enhance the environment. EcoRigs suggested that retired offshore platforms can be used for alternate uses such as artificial

[3] Habitat compensation often in the form of habitat restoration is mandated for Federal Actions that destroy protected habitat, for example, USACE uses *Average Annual Habitat Unit (AAHU)*: which is a method to determine the loss of EFH gained or lost as a result of the Federal Action.

[4] When platforms are removed with explosives, BOEMRE requires oil and gas operators to perform mitigation practices (visual survey) to prevent mortality to marine mammals and sea turtles.

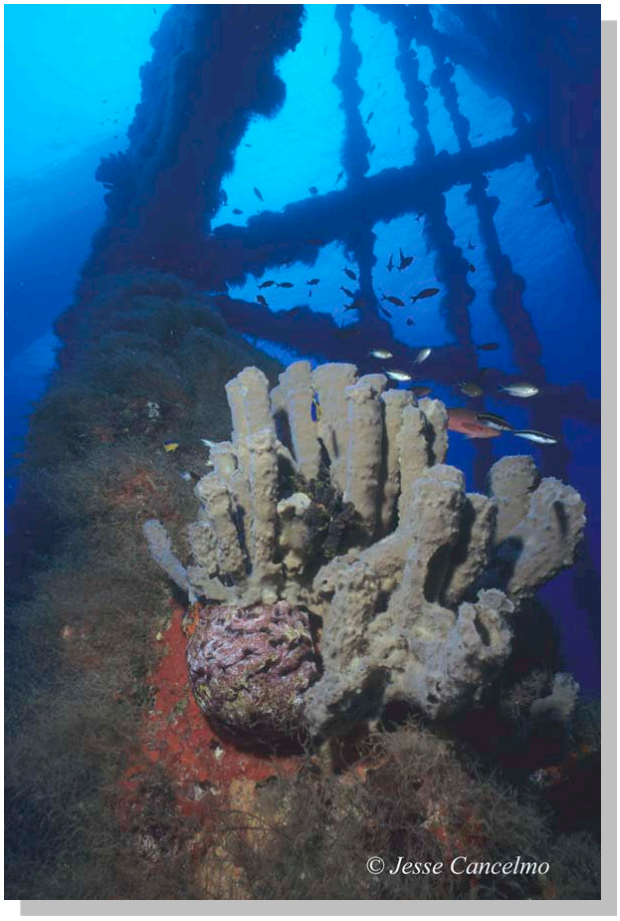
reefs, sustainable fisheries, production of renewable ocean energy derived from wind, current, wave, geo-thermal, salinity gradients, and bio-fuels, hydrogen production, (i.e., extraction of hydrogen from seawater via electrolysis), recreational fishing and diving parks, fish sanctuaries, culture of pharmaceutically valuable organisms and sequestration of greenhouse gases (Kolian and Sammarco 2005). Evaluating these alternate uses could lead to platform preservation, avoid the destruction of the ecosystem and inhabitants, and meet objectives of NEPA; however, BOEMRE does not consider alternatives to platform removal which is another violation of NEPA.

Ambient energy (resource potential) offshore is magnitudes greater than inshore areas.

5.0 Sustainable Fisheries Act/Magnuson Act

The Sustainable Fisheries Act modified the Magnuson Act and created the eight Regional Councils including the Gulf Council. The Gulf Council and NOAA Fisheries are responsible for identifying Federally managed species, and their prey species and their EFH, (i.e., those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity). The species and their habitats are delineated in the Fisheries Management Plans (FMPs) for coral and live rock, reef fish and migratory fish. It is estimated that 49 Federally managed species of fish and at least 30 species of protected invertebrates utilize, to varying degrees, the platform substrate for feeding, spawning, mating, and growing to maturity.

It is obvious that offshore platforms are EFH; however, if the platforms were recognized as "protected habitat," NOAA Fisheries would have to recommend to BOEMRE not to remove the platforms or find alternatives to the action (Alternate Uses) or mitigate the loss of habitat. Almost the entire GOM is considered EFH for one species or another, coral reefs, hard bottom, limestone outcroppings, artificial reefs, submerged aquatic vegetation, unconsolidated sea bottom and open water, everything except the oil and gas platforms. However, the list of Federally protected and managed fish and invertebrates associated with offshore platforms is presented in Appendix A, and demonstrates that platforms should be considered EFH.



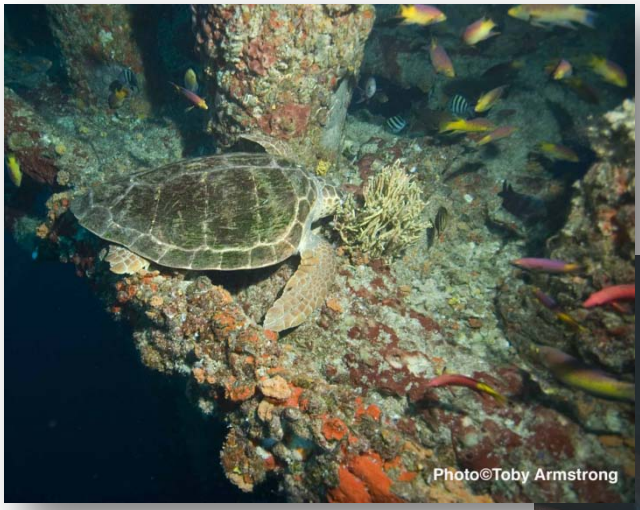
Offshore platforms stand out from all other artificial reefs because they occupy the entire water column, through the splash zone, whereas conventional artificial reefs usually only occupy 10–40 percent of the water column. At petroleum platforms, shallow-water fish, mid-water fish and deep-water fish are all found in the same place.

6.0 Endangered Species Act

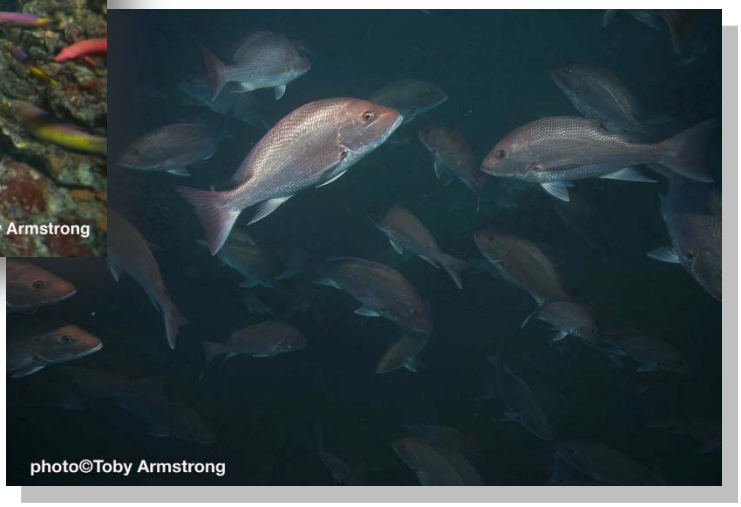
The Endangered Species Act (ESA) is composed of a list of species, designated as endangered, threatened, or a candidate for listing and a strict Federal mandate to protect the habitat they use for growing, feeding, mating, breeding and raising their offspring. Once approved for the Endangered and Threatened list, a species is afforded the full range of protections available under the ESA, including prohibitions on killing, harming, or otherwise "taking" a species. The ESA also protects the habitat of those species listed as endangered or threatened. A critical habitat designation does not set up a preserve or refuge. It applies only when Federal funding, permits, or projects are involved. Under Section 7 of the ESA, all Federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species, or destroy or adversely modify its designated critical habitat. The listed species associated with offshore platforms is presented in Appendix B. The removal of platforms destroys the supply of habitat to listed species, and potentially harms and harasses listed species violating the ESA.

7.0 Reefing an Offshore Platform

A total of 90 percent of the fish either perish or are lost when a platform is converted into an artificial reef (Wilson et al. 2003). Most of the invertebrate community exhibits a preference for the upper 25 meters (98 feet) of the water column beneath a platform (Carney 2005; Sammarco 2004; Dokken et al. 2000; Gallaway et al. 1981). When a platform is toppled over or cut and "reefed," the upper 85 feet of the platform is removed or toppled onto the ocean floor and most of the invertebrates perish when they are re-oriented in the water column. Once the platforms are toppled to create an artificial reef, they are not as productive and they tend to produce and/or attract mostly facultative reef fish such as snapper (L*utjanidae spp.*), grouper (*Epinephelinae spp.*) and jacks (*Carangidae spp.*) (Wilson et al. 2003). Toppling an offshore platform over as an artificial reef does not prevent the mortality of most of the protected marine invertebrates.



The loggerhead turtle (left) was observed sleeping on an offshore platform. Hawksbill (endangered) and Loggerhead (threatened) turtles have been observed resting, sleeping, and foraging on offshore platforms. This behavior suggests that offshore platforms are critical habitat for ESA protected species.



Red Snapper (*Lutjanus campechanus*) are one of the most abundant species of fish at offshore platforms, it is common to find a population of 5,000 snapper at one platform.

8.0 Why does the Federal Government Ignore the Marine Organisms?

The primary concern is that the cost of environmental compliance associated with producing a barrel of oil in the GOM will increase. Platform operators would accrue NEPA, ESA and EFH compliance expenses when they perform routine maintenance, as they often scrape off thousands of marine invertebrates during routine subsurface maintenance.

NEPA compliance for routine maintenance would be a minor annoyance compared to the more difficult legal problem of removing a platform. Federal regulations (30 CFR 250.1725 through 250.1730 Subpart Q) require that the platforms be removed and the site turned to pre-production conditions. These regulations were written in the 1970s. At that time, the authors of Subpart Q were not aware that offshore platforms produced a prolific coral reef ecosystem (Bedell personal comm. 2006). The oil and gas regulations did not change when amendments to the Magnuson Act, which protects marine fish and invertebrates, were they enacted in the 1980s and 1990s. The oil and gas regulations state that the original owner, the operator that installed the platform, is responsible for platform removal and must remain liable until the offshore platform is removed. This liability issue is responsible for the destruction of thousands of acres of coral reef habitat and the mortality of billions of protected marine organisms.

If these environmental laws applied to the offshore oil and gas industry, the offshore operators would have to prepare a NEPA-compliance document for the platform that describes the routine subsurface maintenance. When an oil and gas company removed a platform, they would have to mitigate for the loss of coral reef habitat, which may include creating coral reef habitat elsewhere. Gallaway (1980) estimated that a platform in 20 meters (60 feet) of water provided about 3,800 square meters (1 acre) of hard substrate. Shinn (1974) estimated that a typical platform in water 30 meters (98 feet) deep provides about 8,173 square meters (2 acres) of hard substrate.[5]

Telesto soft corals (*Stereotelesto coralline*) are abundant on offshore platforms.

If platforms could be left in place, the oil and gas owner-operator would still be responsible for day to day maintenance and the eventual removal. The platform would require navigational aids, periodic evaluation and repairs. The offshore operator is liable for any accidents and insurance, and that responsibility would have to be transferred. The Federal regulations require that the previous owner is liable for the platform for its life. It's called "cradle to grave" liability.

[5] The cost to build new coral reef habitat is $637 per square meter (not including installation) of surface area (Reef Ball 2010) and the oil and gas industry will remove approximately = (1.5 acre per platform x 1,250 platforms = 1,825 acres) 7,385,501 square meters of reef habitat in the next 5 years. It is estimated that the cost to build 1,825 acres of reef habitat is approximately $4.7 billion.

9.0 Regulatory Discussion

Money cannot be a reason to avoid mandates issued in NEPA, ESA and the Magnuson Act. BOEMRE and NOAA Fisheries must rigorously explore and objectively evaluate alternatives to destroying the coral reef organisms on oil and gas platforms. They fail to offer alternatives such as sustainable fisheries and renewable ocean energy alternate uses to platform removals. The BOEMRE NEPA analysis of offshore platforms does not mention, let alone mitigate, for the mortality of coral reef organisms that live on offshore platforms. The platforms are one of the most prolific ecosystems on the planet, yet they are the only sites in the GOM that are not designated as EFH. The oil and gas industry would likely have to scrape organisms off the structures before removal and spend billions of dollars to mitigate the loss of the coral reef habitat if NEPA analysis was required. Reefing a structure is not adequate mitigation because 90 percent of the organisms will either perish or move from the site due to a change of location in the water column.

10.0 Enabling Legislation

On June 29th 2009, the Obama Administration and BOEMRE implemented the "*Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf*" program (30 CFR 285.1000 Subpart J). This provides BOEMRE with the authority to issue an Alternate Use (AU) Right-of-Use Easement (RUE) to applicants to use retired platforms for "marine related purposes". These permits (AU RUE) allow retired platforms to remain in the water, after oil and gas production ends, to be used for renewable energy, greenhouse gas sequestration, artificial reefs, etc. EcoRigs has great optimism for the groundwork that was constructed with the implementation of these regulations; however, there is a piece that is missing in the legal framework.

Two species of coral in this photograph, Brain Coral (*Diploria strigosa*) on the right and Great Star Coral (*Monastraea cavernosa*) on the left, they are uncommon but can be found on offshore platforms in blue water.

The successful implementation of the new AU program will depend on a clearly defined authorization to transfer the primary liability of the retired platforms from the previous oil and gas operator to the AU RUE applicant. The ability to transfer the primary responsibility for the eventual removal of the platform from the former oil and gas operator to the AU RUE applicant is not present in 30 CFR 285.1000 Subpart J. The central theme in the "Rigs to Reefs Act" is the authorization to transfer the liability of the platform removal from the oil and gas operator to an Alternate Use applicant. It is critical that the "Rigs to Reefs Act" is included as part of upcoming energy legislation. It is widely known in the oil and gas industry that this issue must be addressed before offshore operators would transfer retired platforms to an alternate user.

The "Rigs to Reefs Act," a 3-page-long off-the-shelf piece of legislation, which has been evaluated by Congress for the last 8 years, can provide the regulatory groundwork to save some of these

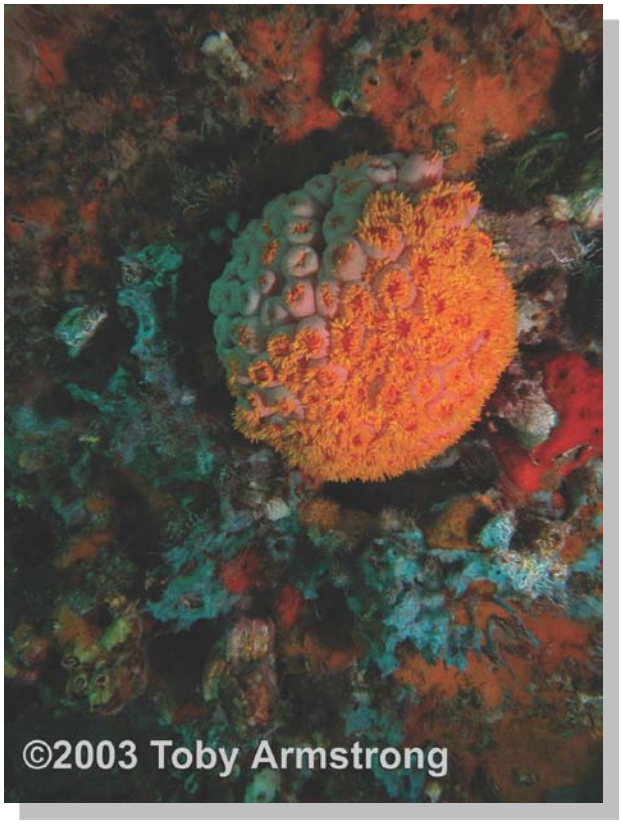
platforms from removal. There are plenty of AUs for retired platforms such as the production of ocean energy (i.e., wind, current, wave, biofuels and solar, sequestration of greenhouse gases, sustainable fisheries). However, there is no clearly defined authorization to transfer the primary liability of the retired platforms from the owner/operator to an AU applicant. The donor, oil and gas industry, would become active partners to encourage this new industry once the liability issue, clearly defined in the Rigs to Reefs Act, is passed through Congress and signed by the President.

11.0 Discussion of Offshore Platform Removal Regulatory

The Interior Department Issues "Idle Iron" Guidance ***Notice Updates Procedures for Decommissioning Offshore Wells, Platforms*** The idea behind the "Idle Iron" policy is to remove hazards offshore by permanently plugging idle wells, decommissioning the pipelines and removing the platforms. The wells may leak if they are not permanently plugged. EcoRigs supports the permanent plugging of the wells and decommissioning of the pipelines, but it is the removal of the platforms that EcoRigs opposes.

Once the wells are permanently plugged and the pipelines are decommissioned, the probability of a leak is reduced significantly. Leaving a platform standing over the well does not make the risk of a leak any more hazardous, in fact a standing platform makes the repair of a leaking well cheaper, safer and compared to the other alternatives, significantly reduces the impact to the environment.

If the wells start leaking, invertebrates living above on the platform will acquire the oil as it passes in the current and the hydrocarbon signature will appear in the tissues of these organisms which can be detected in lab analysis. Sponges, as the name suggests, are excellent bio-indicators, as are oysters and barnacles, because they soak up petroleum hydrocarbons as it passes in the currents. Also, they are abundant, easy to collect and cheap to analyze in the lab. Another approach is to install remote oil sensors on the platforms which could notify operators that a well is leaking. When the platforms are removed, the probability of detecting a leaking well will drop significantly and if they start leaking, the costs in money, time and risks repairing the wells can be much more demanding.



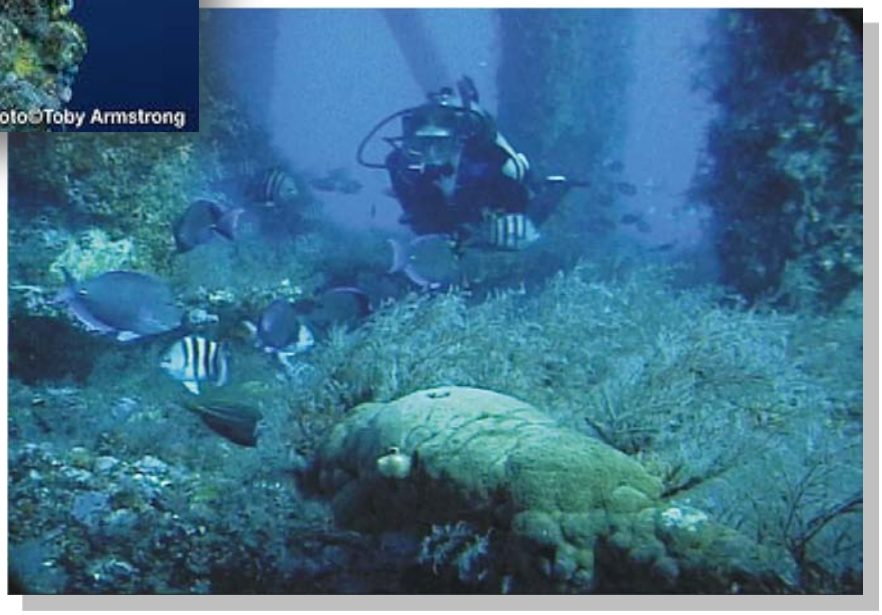
Several species of stony corals (*Sleractinnia*) inhabit offshore platforms. The most abundant are the orange cup coral (*Tubastraea coccinea*).

Offshore platforms can be both a navigational liability and a navigational aid. They provide mariners with a visual reference in the open ocean and they are safe havens to small vessels in distress or in need of a place to tie up in rough seas. However, they are still a collision hazard, which must be weighed against the aid they provide to vessels in the open sea and the habitat value they provide to marine life.

12.0 Conclusion

The GOM continental shelf will lose a third of its offshore platforms in the next 5 years and most of the remaining platforms will be removed in the next 15 to 20 years. EcoRigs' objective is to encourage enactment of environmental laws to prevent the removal of ecologically important structures and advance methods (Alternate Uses) to pay for long-term maintenance and platform liability insurance. The Magnuson Act protects most of the species inhabiting the offshore platforms. The platforms are one of the most prolific ecosystems on the planet, yet they are the only sites in the GOM that are not designated as EFH. The BOEMRE NEPA analysis of offshore platforms does not mention the coral reef organisms that inhabit offshore platforms or impact from platform maintenance or removal. If NEPA analysis was required, the oil and gas industry would likely have to scrape organisms off the structures before removal and spend billions of dollars to mitigate the loss of the coral reef habitat. Reefing a structure is not adequate mitigation measure because 90 percent of the organisms will either perish or move from the site due to a reorientation in the water column. The reason the coral reef habitats are destroyed is because their recognition by the Federal government would increase the cost to produce a barrel of oil in the GOM.

Lobsters appear on deep water (>100 m) structures. In the foreground below, is the less common ten-ray star coral (*Madracis decactis*).



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Appendix A

Distribution of Protected Marine Organisms on Offshore Platforms

The 3,800 platforms are distributed across a 260,000 sq km (161,556 sq mi) area in the northwest Gulf of Mexico (GOM) with the majority (90 percent) of them located on the Louisiana continental shelf (MMS 2009). The location of offshore platforms in the GOM encompasses a wide range of oceanographic conditions and some organisms appear in one or more of these environmental conditions. The Mississippi and Atchafalaya Rivers dominate the ecological conditions of coastal Louisiana, with the amount of fresh water and sediment they disperse, both near shore and sometimes 80-km (50 miles) or more offshore and as far west as Galveston, Texas.

These two rivers control environmental factors such as salinity, suspended material, and primary production which, in turn, determine the composition of fish and invertebrates that inhabit the platforms (Galaway 1980; Dokken 2000; Carney 2006). Other factors are winter weather patterns that cool the shallow coastal waters. Tropical fish are found on inshore platforms when the temperature and water clarity is favorable but not during the winter months when the water temperatures can drop below 20 degrees centigrade. The age of a platform also plays a role in the composition of organisms that grow on the platforms (Carney 2006, Gallaway et al. 1981; Sammarco 2007). The species diversification tends to increases with the age of the platform (Bolan 1999; Carney 2006; Sammarco 2007).

Table A-1 lists the Federally protected species that have been observed on oil and gas platforms and provides an estimate of their abundance on or near oil and gas platforms (Porter, Sammarco and Kolian personal observation) and what platform they are likely visit or inhabit (geographical range). The color of the water to is used to assess the type of organisms that may colonize the underwater substrate of a platform. The following table describes platform locations or environmental conditions where protected organisms tend to appear by water color which is associated with freshwater input and sediments.

Key to Species Distribution

Brown water: brown water zones are typically low salinity and murky due to high volumes of freshwater and sediments usually associated with the coastal regions of northern GOM. These conditions typically extend 8 to 16 km (5 to10 miles) offshore from the Mississippi, Louisiana and eastern Texas coastlines; however, heavy rains can push brown water out to 24 km (15 miles) or more offshore before the water begins to turn green. Water depths less than 15 meters (50 feet) will have mostly brown but occasionally green, murky water with barnacles and oysters as the predominant reef forming organisms on platforms. Offshore of southern Texas, the water is more clear closer to shore because of sandy soils and less freshwater input.

Unstable Green water: The green water conditions offshore of Louisiana typically extend from murky green 16 to 32 km (10 to 20 miles) offshore, out to sustained clear, emerald green, sometime blue water 64 to 80 km (40 to 50 miles) offshore. The green water zone can extend even farther offshore near the border of Texas and Louisiana before reaching a stable salinity. The water surrounding platforms in water depths of 30 meters (98 feet) have a somewhat more stable but still dynamic salinity regime (than the coastal regions) with mostly green and seldom clear blue water. Barnacles, oysters, bryazoans, sponges, hydrazoins and soft corals (gorgonians) (*Telestia spp*.) are the predominant reef organisms on the platforms and the occasional appearance of colonies of stony corals (*Tubastraea coccinae*).

Stable Green water: Platforms residing in 30 to 50 meters (98 to 164 feet) of water encounter water that is typically green and somewhat clear on a consistent basis with occasional days of clear blue water and have more stable, somewhat, less dynamic salinity regime. These reefs still contain mostly barnacles and oysters as well as numbers of soft coral down to a depth of 10 meters; however, significant large patches of stony corals (*Tubastraea c.*) begin to become evident on the subsurface portion of the platforms 10 meters (33 feet) beneath the surface and are, by far, the most abundant reef-forming corals on the structures. Barnacles, oysters, bryozoans, sponges, hydrozoans and soft corals are always present on offshore platforms in stable green water.

Blue water: There is a transition area between blue and green water. There are platforms that encounter fresh water on the surface and cobalt blue water below, and areas that are completely blue but, occasionally, the water is murky green. This blue water transition area usually begins in water depths of 60 meters (197 feet) plus but is found in shallower depths in southern Texas where there is less fresh water input from large rivers. With some exceptions in areas near the Mississippi River, blue water is always present in waters greater than 91 meters (300 feet). The blue water produces a stable salinity regime of around 36 parts per thousand and facilitates the appearance of higher order coral reef organisms such as branching sponges, branching gorgonians, branching small polyp stony corals, Christmas tree worms and encrusting large and small polyp stony corals, etc on offshore platforms. NOAA and the Gulf Council have designated Essential Fish Habitat (EFH) for species that are protected by the Sustainable Fisheries Act and amended Magnuson Act (Table A-1).

Table A-1. Protected species and their abundance at offshore platforms according to the water color in which the platform resides.

Species	Common Name	Abundance and Range of Platforms
***Gorgonians and Hydrozoa* (*Soft Corals*)**		
Class Hydradoza	Fire corals, Hydroids (several species)	Common in unstable green water and abundant in stable green and common in blue water throughout Gulf of Mexico (GOM)
Gorgonacea	Octocoral, Gorgonians (several species)	Uncommon in unstable green water and abundant in stable green (several species) and blue water throughout GOM
Scleractinia (Stony Corals)		
Tubastraea coccinea	Orange Cup Coral	Uncommon in unstable green water and abundant in stable green and common in blue water throughout GOM
Tubastraea micranthus	Black Cup Coral	Uncommon in stable green and blue water offshore Louisiana GOM
Favia fragum	Cup Coral	Uncommon but can be found on structures in blue water
Oculina tenella	Ivory Bush Coral	Uncommon but can be found on structures in blue water
Antipatharia	Black Corals	Uncommon in stable green water but common in blue water

Species	Common Name	Abundance and Range of Platforms
Colpophyllia natans	Boulder Brain Coral	Uncommon but can be found on structures in blue water
Diploria strigosa	Brain Coral	Uncommon but can be found on structures in blue water
Madracsis asperula	Large Ivory Coral	Uncommon but can be found on structures in blue water
Madracis mirabilis	Yellow pencil coral	Uncommon but can be found on structures in blue water
Madracis decactis	Ten-Ray Star Coral	Uncommon but can be found on structures in blue water
Madracis formosa	Eight Ray Finger Coral	Uncommon but can be found on structures in blue water
Montastraea cavernosa	Great Star Coral	Uncommon but can be found on structures in blue water
Phyllangia americana	Hidden Cup Coral	Uncommon but can be found on structures in blue water
Porites astreoides	Mustard Hill Coral	Uncommon but can be found on structures in blue water
Stephanocoenia intersepta	Blushing Star Coral	Uncommon but can be found on structures in blue water
Stephanocoenia michelinii	Blushing Star Coral	Uncommon but can be found on structures in blue water
Reef Fish		
Seriola rivoliana	Almaco jack	Abundant in stable green and blue water throughout GOM
Seriola zonata	Banded rudderfish	Abundant in stable green and blue water throughout GOM
Mycteroperca bonaci	Black grouper	Common in stable green and blue water throughout GOM
Pomatomus saltatrix	Bluefish	Abundant in stable green and blue water throughout GOM
Scomberomorus regalis	Cero	Abundant in stable green and blue water throughout GOM
Lutjanus cyanopterus	Cubera snapper	Rare in stable green and blue water throughout GOM
Lutjanus jocu	Dog snapper	Uncommon but can be found on structures in blue water
Mycteroperca microlepis	Gag	Common in stable green and blue water throughout GOM
Balistes capriscus	Gray triggerfish	Abundant in unstable green, stable green and blue water throughout GOM
Lutjanus griseus	Gray (mangrove) snapper	Abundant in brown, unstable green, stable green

Species	Common Name	Abundance and Range of Platforms
		water throughout GOM
Seriola dumerili	Greater amberjack	Abundant in stable green and blue water throughout GOM
Lachnolaimus maximus	Hogfish	Abundant in stable green and blue water throughout GOM
Epinephelus itajara	Goliath grouper	Uncommon in the GOM but can be found on structures in waters greater than 200 feet
Lutjanus synagris	Lane snapper	Uncommon in stable green and blue water throughout GOM
Seriola fasciata	Lesser amberjack	Common in stable green and blue water throughout GOM
Euthynnus alletteratus	Little tuny	Abundant in stable green and blue water throughout GOM
Epinephelus inermis	Marbled grouper	Uncommon in stable green and blue water throughout GOM
Lutjanus analis	Mutton snapper	Uncommon blue water throughout GOM
Sciaenops ocellatus	Red drum	Abundant in brown and unstable green water throughout GOM
Epinephelus morio	Red grouper	Common in stable green and blue water throughout GOM
Epinephelus guttatus	Red hind	Common in stable green and blue water throughout GOM
Lutjanus campechanus	Red snapper	Common in unstable green water and abundant in stable green and blue water throughout GOM
Epinephelus adscensionis	Rock hind	Common in stable green and blue water throughout GOM
Mycteroperca phenax	Scamp	Common in stable green and blue water throughout GOM
Lutjanus apodus	Schoolmaster	Uncommon in blue water throughout GOM
Lutjanus vivanus	Silk snapper	Uncommon in blue water throughout the GOM
Epinephelus niveatus	Snowy grouper	Uncommon in stable green and blue water throughout GOM
Epinephelus drummondhayi	Speckled hind	Common in stable green and blue water throughout GOM
Epinephelus nigritus	Warsaw grouper	Common in stable green and blue water throughout GOM
Rhomboplites aurorubens	Vermilion snapper	Uncommon in stable green water and blue water throughout the GOM
Epinephelus flavolimbatus	Yellowedge grouper	Common in waters greater than 180 feet throughout GOM
Mycteroperca venenosa	Yellowfin grouper	Common in stable green and blue water throughout

Species	Common Name	Abundance and Range of Platforms
		GOM
Mycteroperca interstitialis	Yellowmouth grouper	Common in stable green and blue water throughout GOM
Ocyurus chrysurus	Yellowtail snapper	Common in blue waters in throughout GOM
Stone Crab and Lobster		
Panulirus argus	Spiny lobster	Uncommon in blue waters throughout GOM
Menippe mercenaria	Stone crab	Abundant in brown waters throughout GOM
Coastal Pelagic		
Rachycentron canadum	Cobia	Abundant in brown, unstable green, green and blue waters throughout GOM
Scomberomorus cavalla	King mackerel	Abundant in brown and unstable green waters throughout GOM
Scomberomorus maculatus	Spanish mackerel	Abundant in brown and unstable green waters throughout GOM
Tuna		
Thunnus albacares	Atlantic yellowfin	Uncommon in stable green water and abundant in blue water throughout GOM
Katsuwonus pelamis	Skipjack	Uncommon in stable green water and abundant in blue water throughout GOM
Billfish		
Makaira nigricans	Blue marlin	Uncommon in blue water throughout GOM
Pelagic Sharks		
Isurus oxyrinchus	Shortfin mako shark	Uncommon in blue water throughout GOM
Carcharhinus longimanus	Oceanic whitetip shark	Common in blue water throughout GOM
Coastal Sharks		
Sphyrna tiburo	Bonnethead	Common in brown and unstable green and green water.
R. *terraenovae*	Atlantic sharpnose	Common in brown and unstable green and green water.
Carcharhinus acronotus	Blacknose shark - shark -	Common in brown and unstable green and green water.
R. *porosus*	Caribbean sharpnose	Common in brown and unstable green and green water.
C. isodon	Finetooth shark	Common in brown and unstable green and green water.
C. porosus	Smalltail shark	Common in brown and unstable green and green water.

Occurrence Categories: Rare, Uncommon, Common, and Abundant.

Detailed information on Federally managed fisheries and their EFH is provided in the 2005 Generic Amendment of the Fishery Management Plans for the GOM prepared by the Gulf Council.

Appendix B

List of Endangered Species Associated with Offshore Platforms

Platform residents in the GOM listed as endangered include three species of turtles; species listed as threatened included two species of turtles and two species of coral. The endangered Hawk's bill turtle (*Eretmochelys imbricate*) and threatened Loggerhead turtle (*Caretta caretta*) forage, rest and sometimes sleep on offshore platforms and the other listed species are often observed at offshore platforms.

Elkhorn coral (*Acrapora palmata*) and Staghorn coral (*Acrapora cervicornis*) are the only two listed corals occurring in the northern GOM. Elkhorn coral is believed to exist on a few platforms on the outer continental shelf although more data are needed to validate its presence. If threatened or endangered corals inhabit an offshore platform, then the structure could not be removed.

Species of Concern are those species about which National Oceanic Atmospheric Administration's (NOAA) Fisheries Service 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). The Species of Concern status does not carry any procedural or substantive protections as does the Threatened and Endangered status under the ESA.

Two fish in the GOM are listed as Species of Concern, the Warsaw grouper (*Epinephelus nigritus*) and Speckled hind (*Epinephelus drummondhayi*) are common around offshore platforms. These are cryptic species that spend a significant portion of their lives on the platforms feeding, mating and growing to maturity. Sand tiger sharks (*Odontaspis Taurus*) and dusky sharks (*Carcharhinus obscures*) are listed species of concern and these pelagic sharks have been observed visiting offshore platforms.

A petition to list 83 Species of Corals as Threatened or Endangered under the ESA appeared in the Federal Register / Vol. 75, No. 27 / Wednesday, February 10, 2010. This petition is still under review; however, one of the species, boulder star coral (*Montastraea annularis*), is proposed for listed as endangered, is not common, but present on platforms in deeper water. Three other species in listed as vulnerable grow in the GOM, the elliptical star coral or pineapple coral (*Dichocoenia stokesii*), large ivory coral or ivory bush coral (*Oculina varicose*) and mountainous star coral (*Montastraea faveolata*). These corals may live on offshore platforms although more data is needed to validate their presence. Table B-1 summarizes the ESA listed species found in the GOM and their relationship to offshore oil and gas platforms.

Table B-1. List of ESA Species Known to Inhabit Offshore Platforms and their ESA Status.

Species	ESA Category	Relationship to Oil and Gas Platforms	Abundance and Range (1)
Hawk's bill turtle	Endangered	Adult and juvenile forage, sleep and rest	Uncommon on platforms in stable green and blue water throughout GOM.
Loggerhead turtle	Threatened	Adult and juvenile forage, sleep and rest	Uncommon on platforms in stable green and blue water throughout GOM.
Warsaw grouper	Species of Concern	Live most of their life cycle: feed, mate and grow to maturity.	Common on platforms in stable green and blue water

Species	ESA Category	Relationship to Oil and Gas Platforms	Abundance and Range (1)
			throughout GOM.
Speckled hind	Species of Concern	Live most of their life cycle: feed, mate and grow to maturity.	Common on platforms in stable green and blue water throughout GOM.
Boulder Star Coral	Endangered (on Petition List)	Permanently attaches to platforms, feed, breed, grow to maturity.	Uncommon on platforms in blue water.

1. See Appendix A for key to water types.