6 ALTERNATE USES OF EXISTING OIL AND NATURAL GAS PLATFORMS ON THE OCS

The Minerals Management Service (MMS) has the discretionary authority to authorize activities that use, for energy or other marine-related purposes, facilities that are currently or were previously used for other activities authorized under the OCS Lands Act (OCSLA)—alternate use. The new subsection 8(p) authority only applies if the proposed underlying activities are not authorized by another statutory authority, including other provisions of the OCSLA, the Deepwater Port Act of 1974, the Ocean Thermal Energy Conversion Act of 1980, or other applicable law.

For example, OCSLA subsection 8(p) covers the case where a company seeks to use an existing oil and gas platform to conduct aquaculture activities. Because aquaculture activities on the OCS are not currently authorized by another statute, the MMS would have the discretion to issue an alternate use authorization for such aquaculture activities. The MMS would work closely with the National Oceanic and Atmospheric Administration (NOAA) and would likely enter into a formalized agreement with NOAA to ensure that such aquaculture activities are properly approved and managed.

OCSLA subsection 8(p) does not apply in the case where a company seeks to convert an existing oil and gas platform to a deepwater port. The activities associated with the construction and operation of deepwater ports are authorized under the Deepwater Port Act of 1974, as amended, and regulated jointly by the U.S. Coast Guard (USCG) and U.S. Maritime Administration (MARAD). In this situation, because deepwater ports are authorized under the Deepwater Port Act, the MMS does not have subsection 8(p) alternate use jurisdiction over these activities; however, MMS approvals may still be necessary under other MMS regulatory authorities (such as those requirements found in Part 250 and Part 282 of Title 30 of the *Code of Federal Regulations*).

6.1 NUMBER OF EXISTING OIL AND GAS PLATFORMS POTENTIALLY AVAILABLE FOR ALTERNATE USE

OCS oil and gas platforms in the United States exist in the Gulf of Mexico and off the coast of Southern California. As of July 5, 2007, there were 3,922 active oil and gas production platforms on the Gulf of Mexico's Federal OCS (Figures 6.1-1 and 6.1-2). One forecast of offshore platforms on the Gulf of Mexico OCS projects a decline of about 29% of operating offshore structures over the 1999–2023 period. Alternative forecasts suggest a decline of between 20% and 35%. This expected decline results from the significant increase in the projected number of platforms removed above current levels, compared with only a slight increase in the number of platforms installed (although the size of the installed platforms is expected to be greater than the size of those being removed from service). By the year 2023, the number of platforms ceasing production in the Gulf is forecast to be roughly 1,075 (Pulsipher et al. 2001). According to a recent measure, approximately 100 to 150 platforms are removed annually from the Gulf of Mexico.

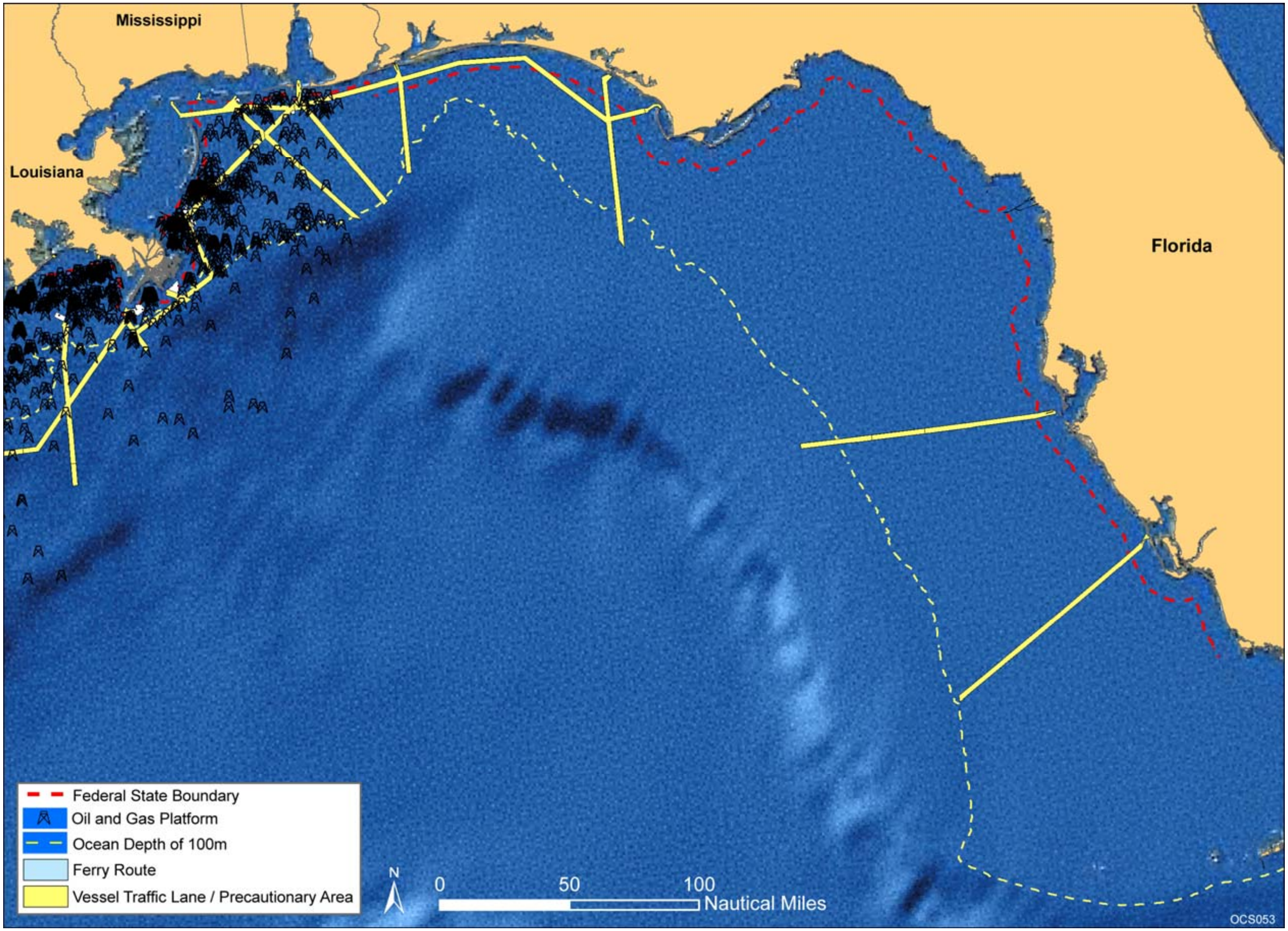

FIGURE 6.1-1 Oil and Gas Platforms in the Eastern Gulf of Mexico

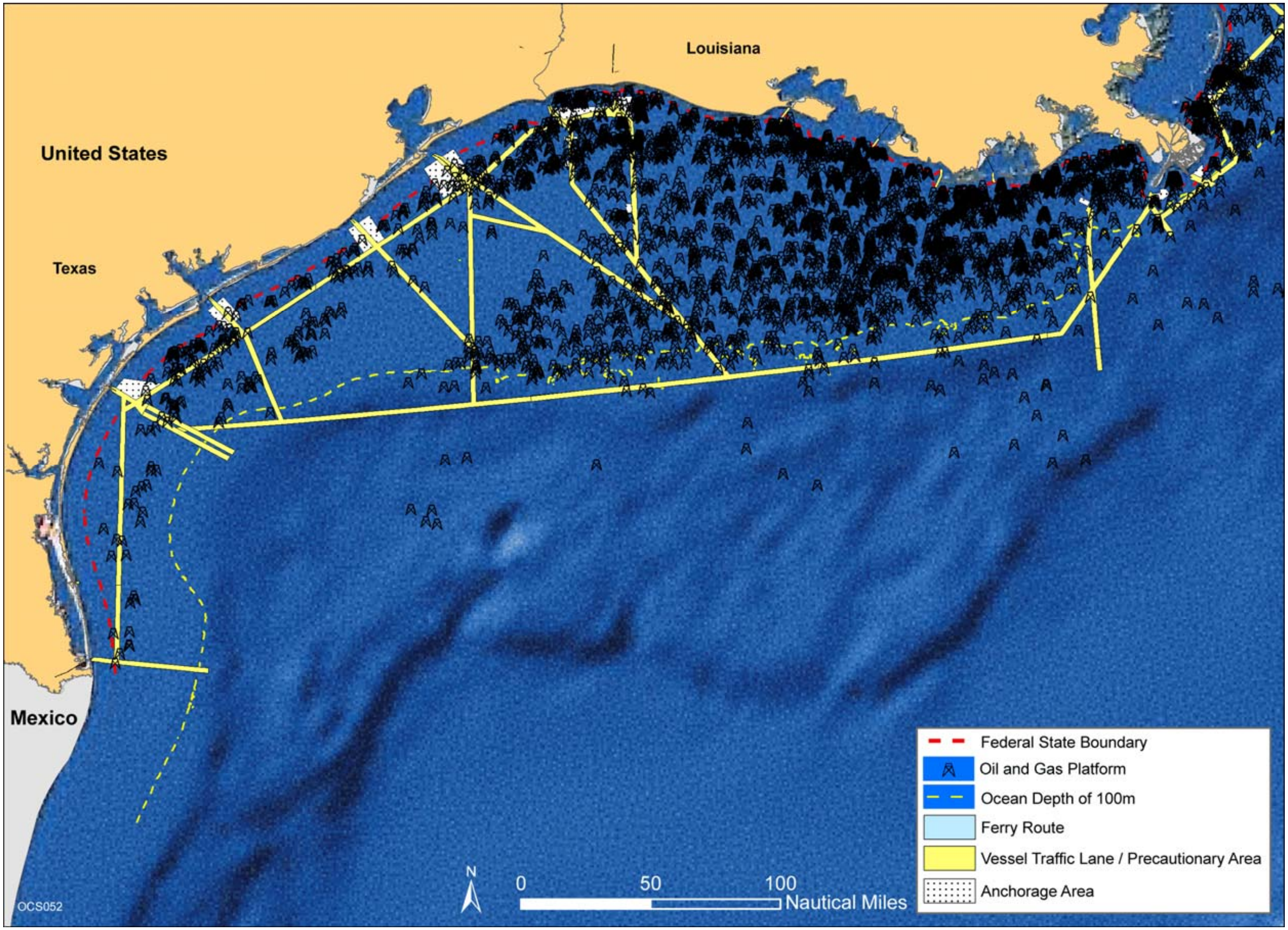

FIGURE 6.1-2 Oil and Gas Platforms in the Western Gulf of Mexico

There are 23 oil and gas platforms on the OCS off the coast of California, all of which are expected to cease production by 2025, and some may cease production within the next 5 to 7 years. Their locations are shown in Figure 6.1-3. Love et al. (2003) provide synopses of individual platforms off the coast of California, including the date of platform installation and first production date, which may be useful in projecting platform-specific closure dates.

6.2 ENVIRONMENTAL IMPLICATIONS FOR PLATFORMS LEFT IN PLACE

The indirect impacts of a proposed action such as alternate use must be addressed under the National Environmental Policy Act (NEPA). Because offshore oil and gas structures would continue to remain on the OCS for the duration of their alternate use, such use would have an indirect impact on the environment. However, when the alternate use of a structure ceases, it would be removed from the OCS as will be required in the proposed regulations. This section summarizes the impacts from leaving existing oil and gas structures on the OCS for the duration of their alternate use.

Operating oil and gas platforms function as artificial reefs. The MMS may grant a departure from the requirement to remove a platform or other facility if the structure becomes part of a State artificial reef program, and the responsible State agency acquires a permit from the U.S. Army Corps of Engineers and accepts title and liability for the structure, and if the structure satisfies any USCG navigational requirements. The use of these structures as artificial reefs is a practice that has been supported by the MMS, the oil and gas industry, and several environmental groups. The objectives of such use include the improvement of local fishing success, replacement of aquatic resources that have been lost due to anthropogenic impacts, recreational opportunities for fishing and scuba divers, and conservation purposes or environmental enhancement (Holbrook et al. 2000). If a platform is to be left in place for any alternate use after its operational life is complete as considered in Section 6.3, the platform will continue to function as an artificial reef as well. The following provides a brief description of oil and gas structures as artificial reefs and the attendant impacts to expect in addition to those presented in Section 6.3 from alternate uses such as alternative energy production, offshore aquaculture, and research and monitoring.

6.2.1 Description

The underwater support structure of oil and gas platforms is typically a metal lattice structure, which is itself supported by four or more piles driven into the ocean floor. Within weeks of installation in the marine environment, invertebrates and seaweeds attach themselves to the platform structure. The structure may be completely covered within a year by such organisms, attracting mobile invertebrates and fish species and resulting in a complex food web. The structures provide new places to live, serve as protection for young and adult fish, provide a place to rest away from swift ocean currents, and serve as hunting grounds for many fish species. A typical platform provides about 8,000 to 12,000 m^2 (2 to 3 acres) of living and feeding habitat for thousands of underwater species. In the Gulf of Mexico, this transformation of a steel structure into an intricate ecological system is significant because the ocean floor is rather barren, composed of mud and clay with little natural rock bottom and reef habitat. Fish densities

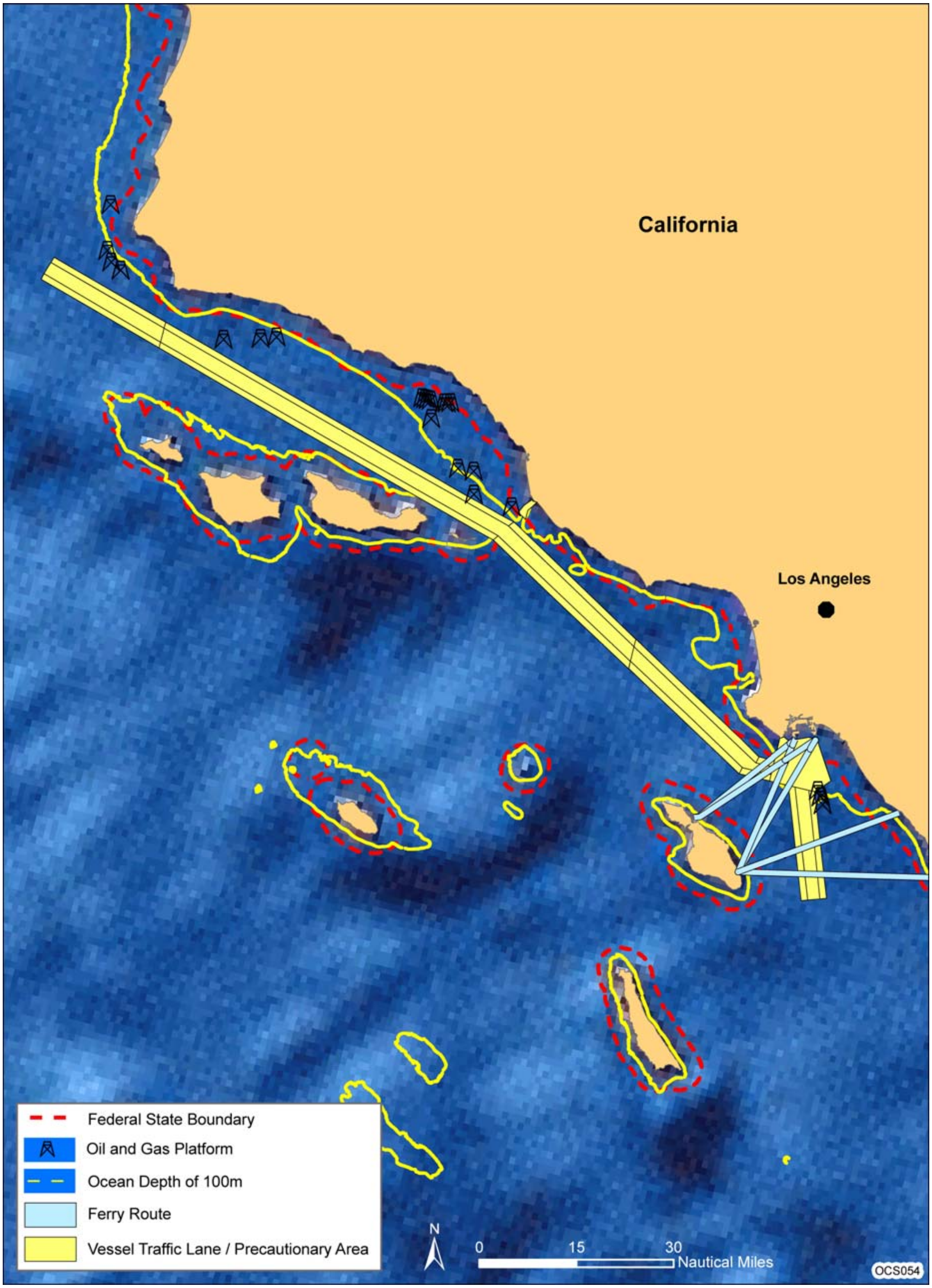

FIGURE 6.1-3 Oil and Gas Platforms Off the California Coast

may be as high as 20 to 50 times higher at oil and gas platforms than in the surrounding open water.

Historically, approximately 8% of the platforms decommissioned in the Gulf OCS have become used in the Rigs-to-Reefs program. By the end of 1999, 151 of 1,879 retired platforms in the Gulf of Mexico had been converted to artificial reefs (Dauterive 2000). These platforms were towed and placed in a different location, "toppled-in-place," or had a partial in-place removal. Tow-and-place and topple-in-place result in the structure resting on its side in a preferred reef location. Partial removal in place consists of removing the topmost section of the support structure, so it is not a shipping hazard, and placing the top part of the structure on the ocean floor near the bottom section. The use of explosives during decommissioning is discouraged to minimize the destruction of existing living organisms on the support structure. However, in the case of alternate use, the structure remains in place and only minor alteration, if any, of the superstructure would occur.

Most reefs have been established off the coasts of Louisiana and Texas, and a few have been established off the coast of Alabama. The MMS encourages the reuse of obsolete offshore petroleum structures as artificial reefs in U.S. waters as long as the structures do not pose an unreasonable impediment to future mineral development. Also, the State agency responsible for managing marine fisheries resources must accept liability for the structure before the MMS will release the Federal lessee from obligations in the lease instrument. Under the MMS Rigs-to-Reefs program, companies donate structures, install the reefs, and make financial donations to the States from any realized savings related to avoided disposal costs. Under alternate use, the structure's function as an artificial reef is secondary when a platform is left in place for another purpose.

6.2.2 Impacts

A beneficial impact of these artificial reefs is the fisheries enhancement for both commercial and recreational fishing. Also, if an alternate use were not pursued, the complete ecosystem associated with the structure would be destroyed if the structure were taken onshore and dismantled after being removed from service. It has been noted that fish density and biomass are about one order of magnitude (10 times) higher around a working production platform (possibly similar to what would occur with an alternate use platform) than one converted to an artificial reef, either toppled-in-place or partial removal, or a natural reef (Wilson et al. 2003). Data gathered indicate that more vertical relief enhanced fish density, with the upper levels of the natural reef having a density similar to that of the artificial reefs. In addition, fish species found in lower depths around the production platforms were absent from waters at the same depth over the artificial and natural reefs, although similar species were noted at lower depths around both the production platform and the artificial and natural reefs (Wilson et al. 2003). However, a greater abundance of species types was noted around the natural reefs.

An artificial reef may attract aquatic species from nearby natural reefs, which may or may not eventually lead to a population increase depending on whether or not population levels return to pre-existing conditions at the natural reef. As an adverse impact, some species may be attracted to and concentrated at an artificial reef where there may be increased fishing pressure that could result in overfishing and depleted fishing stocks (Matthews 1985). On the positive side, attraction to artificial reefs could result in increased survival, growth, or reproduction (Schroeder and Love 2004; Love et al. 2005, 2006; Love and Schroeder 2006).

The artificial reefs attract more than commercial and recreational fishermen if they are in shallow water (i.e., less than approximately 50 m [160 ft]). These reefs also attract recreational divers who are eager for underwater exploration. The commercial fishing opportunities and tourism generated by recreational fishing and underwater diving have a positive economic impact on local coastal communities (Hiett and Milon 2002). Thus, platforms closer to shore may be better suited for use as artificial reefs.

Conversion of a retired oil and gas platform to an alternate use structure can also have an added economic impact on both the platform owner and local communities. Removing a platform from the marine environment and bringing it onshore to dismantle it for disposal is costly. Leaving the platform in place for an alternate use defers this cost, although some provisions must be made for the eventual disposition of the platform, such as its removal from the offshore environment or conversion to an artificial reef.

The location of an alternate use structure will affect its impact, both environmental and economic, as an artificial reef. Depth of water, lattice structure, and vertical relief determine the potential fish and invertebrate species that may thrive within the affected area, as does the water's turbidity. Reefs near urban areas are expected to be visited more often than those further away, and reefs in shallower waters will be more attractive for recreational divers.

6.2.3 Mitigation Measures

Oil and gas platforms selected for alternate use with secondary use as an artificial reef that is considered to be important should be easily accessible to the public if the structures are intended to provide recreational opportunities such as fishing and diving. Given the local water conditions, the aquatic species associated with the platform should be a thriving community native to the region so as to provide a long-lasting resource that enhances existing habitats. In addition, platforms selected for alternate use should be in areas that minimize any negative impacts to any collocated natural reefs.

6.3 ALTERNATE USES FOR EXISTING OIL AND GAS PLATFORMS

Specific alternate uses depend on factors such as location, water depth, structure condition, local environmental conditions, economics, and meteorological conditions. With the appropriate conditions, alternate uses for which these oil and gas structures could be adapted include alternative energy production, aquaculture, and research and monitoring. The following discussion is meant to illustrate some of the potential uses of structures and is not exhaustive.

6.3.1 Alternative Energy Production

Offshore alternative energy production and its impacts are covered in Chapter 5 for the installation and construction of new facilities on the OCS. However, existing oil and gas platforms and their associated infrastructure could be reused or leveraged to minimize the impacts of potential platform removal and the installation of new structures associated with alternative energy production.

6.3.1.1 Description

Existing oil and gas platforms can become integral components of alternative energy facilities on the OCS. As discussed in Chapter 3, a common element among the wind, wave, and current generation facilities is an electrical collection point, an electric service platform (ESP), which is placed among the individual offshore electricity-generating modules (e.g., wind-turbine generators [WTGs]) for the generated electricity. This electrical hub contains the necessary equipment for merging the electricity from all generator modules and sends it along a single submarine cable connecting the offshore generating facility to an onshore facility connected to the onshore electrical grid. If the location of an existing oil and gas platform is in a location suitable for alternative energy generation, the platform could be a new alternative energy facility's ESP.

Some oil and gas platforms could be used as platforms for WTGs or as anchor points for wave energy conversion devices (WECs). The transport of a decommissioned oil and gas platform to a new location for its alternate use is also possible.

In a variation on alternate use, the Beatrice Wind Farm Demonstrator Project is currently testing the technical and economic feasibility of offshore wind energy generation adjacent to an oil field in water depths of approximately 45 m (147 ft). Two 5-megawatt (MW) WTGs are in the process of being installed 1 to 2 km (0.6 to 1.2 mi) from the Beatrice Alpha complex, which is 24 km (15 mi) off the coast of Scotland. The WTGs will be connected to the Beatrice AP platform, providing approximately one-third of the power required to operate Beatrice for the 5 years of the demonstrator project (Talisman Energy 2006). Should the demonstration project prove successful, a wind facility could be developed at the site, which could eventually use Beatrice's submarine power cable connection to shore for the transmission of electricity.

6.3.1.2 Impacts

As ESPs, oil and gas platforms are large enough to handle the required electrical equipment and have docking facilities for service boats: many have, or could be modified to support, a helipad for transport of maintenance crews and equipment. In addition, some of these platforms (in the Pacific) already have submarine cable connections to onshore locations for electrical power that could be used for transmitting rather than receiving power, thus obviating the need to install new cable between onshore and offshore locations. For those platforms without a cable connection, an existing pipeline to shore may exist through which a new power cable could be inserted. Thus, impacts related to installation of such a hub are minimized. Some conversion would be necessary, but direct underwater impacts such as seabed disturbance would be negligible. Installation of the individual generating units and connection via submarine cable to the platform would have the same impacts as those discussed in Chapter 5 for construction and operation.

For wind energy, an alternative would be to use the existing platform base to mount a WTG along with or instead of the electrical hub. Such an approach could be suitable for a demonstration project and could be part of a commercial-scale facility if multiple platforms were collocated and modified or additional WTGs added separately. Similarly, platforms could incorporate or be used to anchor WEC devices in addition to acting as an ESP. For any of these options, underwater disturbances would be minimal as the seafloor would be disturbed only for installation of new devices not accommodated by the platform.

Existing oil and gas platforms could also be used for site characterization for alternative energy facilities. If sited in a suitable location, such a platform could become the base of operations for a characterization effort that could provide observation facilities (e.g., a meteorological tower, observation deck, underwater exploration) or support facilities (e.g., vessel docking and sheltering). Impacts from characterization efforts would remain the same as discussed in Chapter 5, but the environmental impacts (habitat disturbance) caused by platform removal and facility installation would be eliminated.

6.3.1.3 Mitigation Measures

Impacts from the use of existing oil and gas platform infrastructure for alternative energy technologies would be mitigated with measures similar to those discussed in Chapter 5 for operations and decommissioning of such projects.

6.3.2 Aquaculture

Existing platforms could be used for aquaculture, possibly reducing many of the problems associated with aquaculture at existing nearshore facilities. Potential benefits of using OCS aquaculture facilities could include the availability of large volumes of good-quality water, reduced user conflicts, increased employment, and decreased reliance on foreign imports. Potential drawbacks could include escape of non-native populations; introduction of parasites and diseases in wild populations; impacts from the use of drugs, antibiotics, and pesticides; and negative socioeconomic impacts on fishing communities. There is also a potential for adverse impacts should an OCS aquaculture facility be destroyed or damaged in an event such as a hurricane and release aquaculture fish, feed, debris, and chemicals into the ocean.

6.3.2.1 Description

Aquaculture is now being used to provide almost half of the world's seafood, and the demand is still growing (FAO 2005). Of the 6 million metric tons (MT) (6.6 million tons) of seafood consumed in the United States annually, 1.5 million MT (1.6 million tons) come from domestic commercial fisheries and 0.5 million MT (0.6 million tons) from domestic aquaculture. The remaining 4 million MT (4.4 million tons) are imported, with about half from aquaculture (NOAA 2006f). Thus, more than 40% of seafood consumed in the United States is a product of aquaculture and about 70% is imported. Domestic production has centered on inland and coastal facilities. The National Oceanic and Atmospheric Administration (NOAA) has fostered programs for the development of aquaculture in these areas and is also looking to support development in offshore areas (NOAA 2007b). However, development of offshore aquaculture in the United States has been hindered by a lack of clear Federal regulations (Nash 2004; Cincin-Sain 2005; Naylor and Burke 2005).

The opportunity to extend U.S. aquaculture into the open ocean, including association with oil and gas structures (Reggio 1996), has long been recognized for its potential to utilize large areas with excellent water quality. In addition, offshore locations are attractive because the best coastal locations for aquaculture are already developed, and development offshore would not impede public access to coastal waters or conflict with nearshore recreational activities, fisheries, and coastal aesthetics (Naylor and Burke 2005; Chambers and Howell 2006). Aquaculture practiced in conjunction with operating or decommissioned oil and gas platforms has the added benefit of an established infrastructure for support.

A retired oil and gas platform can serve as the hub for aquaculture operations. It can support a number of important functions such as providing crew quarters, storage areas for feed and supplies, and docking facilities for supply and crew boats or helicopters. The infrastructure necessary for power and communications equipment for operations should also be present. Net pens or cages can be moored nearby or off the actual platform itself depending on design. Depending on size, the platform itself could be used for hatchery operations, eliminating the need for transport (and potential loss through mortality for some) of the juvenile stock to the offshore aquaculture operations.

In the case of operating platforms, net pens or cages could be moored nearby, taking advantage of infrastructure support, including power and communications as well as potentially shared storage space and crew support (e.g., transportation and/or lodging). In addition, mussels, scallops, and oysters are currently harvested for human consumption from the legs of operating oil platforms off the coast of Southern California during cleaning operations (McGinnis et al. 2001). Divers also suspend bags with juvenile clams from the platforms for harvest after a few months.

6.3.2.2 Impacts

Offshore aquaculture is expected to have impacts similar to those from coastal aquaculture operations. Impacts related to waste generation, native and non-native species, fisheries, and predators need to be recognized and addressed. With proper design and management, impacts to the environment would be negligible to moderate.

Pollution is a major concern related to aquaculture. Wastes that must be anticipated include urine (nitrogenous wastes), feces (highly organic wastes), excessive feed materials, pharmaceuticals (e.g., antibiotics), growth-enhancing chemicals (e.g., hormones), and antifoulant chemicals (Cincin-Sain et al. 2005). The amount of antibiotics required in aquaculture operations can be reduced through vaccinations and improving the cultured species' natural resistance by reducing stresses placed on them (Goldburg et al. 2001). Methods to reduce stress include improving water quality, lowering stock densities, and less handling.

Impacts to surrounding water quality would be dependent on water flow in the area and the amount and types of waste generated. If waste were excessive, productivity would be expected to suffer with the water quality, which could result in changes in the chemistry or physical nature of the surrounding environment, possibly making the area unsuitable for specific natural biota. Eutrophication (overenrichment with organic material) can occur from aquaculture operations debris, which are primarily organic wastes. Eutrophication results in impacts such as low dissolved oxygen levels and murky water, leading to the death of seagrasses and corals, fish kills, and possibly harmful algal blooms (Goldburg et al. 2001). Such waste could settle to the ocean floor under netpens (e.g., finfish farming) where there is the potential for impacts to benthic communities, such as smothering or oxygen depletion resulting in reduced biodiversity and a potential dead zone. These latter impacts would occur to a lesser degree with more separation of the aquaculture pens or cages from the ocean floor with adequate circulation to disperse the waste (Cincin-Sain et al. 2005).

Aquaculture operations are affected by the surrounding water quality as much as these operations affect surrounding water quality. One attraction of offshore operations is the availability of better water quality than is often the case for nearshore locations. On the other hand, association of operations near operating or retired oil and gas structures raises concerns about the impacts of water and sediment contamination (hydrocarbons and trace metals, including mercury) on aquaculture from oil and gas drilling and extraction operations.

More study is required, but existing data suggest that such impacts can be negligible. While trace concentration levels of mercury, associated with drilling muds, have been found to be slightly higher in sediments near offshore drilling sites than in general across the Gulf of Mexico, concentrations of methylmercury, from which mercury can easily be assimilated into living organisms, were found to be similar at most of the same near- and far-field locations with respect to the drilling sites (Trefry et al. 2007). Also, initial information on rockfishes near, and mussels harvested from, oil platforms off the coast of California showed no detectable levels of trace metal or hydrocarbon contamination in the aquatic species studied (Schroeder and Love 2004).

Care must be taken in the selection of species for use in aquaculture operations. There could be adverse impacts whether the aquaculture species is native or non-native to the region where cultivation is planned. It is generally agreed that non-native species should not be used to avoid their establishment in the local ecosystem along with the introduction of new non-native diseases (Cincin-Sain et al. 2005). Even with the selection of native species, there are concerns with the escape of cultured organisms into open waters and their interaction with wildlife. Escapees may compete for food and habitat, reproduce and cause a change in population outside the natural distribution range, cause a shift in the wild gene pool, or spread disease. To avoid the facility being a concentrator of diseases, treatment of disease within an aquaculture facility should involve vaccines rather than antibiotics whenever possible to reduce any environmental problems associated with antibiotics (Cincin-Sain et al. 2005).

Cultured species require a diet that may impact wild fish populations. Carnivorous species require approximately 2.5 to 5 times the amount of fish biomass as feed as is produced, while other species require less than 1 unit of feed per unit produced (Naylor et al. 2000). However, some estimates suggest that up to 10 times the amount of fish biomass is required as is produced for carnivorous species in the wild, indicating that the relative feed efficiency of aquaculture is better than in the wild (Naylor et al. 2000). Also, the source of feed to be used must be carefully considered because of implications to wild fish populations and the ecosystem in general (Naylor et al. 2000). A reduction in the forage fish needed for feed can be achieved through the farming of fish low on the food chain, especially noncarnivorous fish such as catfish, tilapia, and carp.

Predators can be a problem for aquaculture facilities, which need ways to exclude predatory biota, including marine birds and mammals such as seals and sea lions, which are attracted by the culture species and their feed. Driving these predators away can be troublesome, and any plan must conform to existing laws and regulations, including those protecting threatened and endangered species. Acoustic deterrents may be used, but their effectiveness requires further study (Goldburg et al. 2001). In addition, the attendant noise pollution could cause various levels of injury to different marine species and cause nonpredatory species to avoid the area (Goldburg et al. 2001). As another option, facility siting several miles from marine mammal rookeries and haulout areas can be used to reduce the number of predators near an aquaculture facility (Moore and Wieting 1999; Goldburg et al. 2001). Injury to and harassment of cultured species can also be minimized by properly tensioning netpen lines and by the use of thicker ropes to avoid entanglement, and more effective predator nets (e.g., double nets) (Moore and Wieting 1999; Goldburg et al. 2001).

Siting of an aquaculture facility should avoid areas essential to the commercial fishing industry so as not to reduce natural fisheries production. Such areas include essential fish habitat and traditional fishing grounds. Adverse impacts could result from any combination of effects related to the potential problems discussed above such as pollution, escaped cultivated organisms, and predators. However, the growth of aquaculture has arisen, in part, as a result of demand and overfishing with the subsequent depletion of wild species. As an example, Atlantic salmon, a species nearly depleted in the wild, is the most farmed finfish in the world. Even though farmed salmon production was 68% higher than wild capture in 2002, capture levels of Atlantic and Pacific salmon remain higher than 1990 levels when global aquaculture production of salmon was insignificant (Naylor and Burke 2005). In this case, aquaculture supplements fishing.

6.3.2.3 Mitigation Measures

A number of mitigative actions can be taken to avoid adverse impacts from aquaculture operations on the OCS. Native species should be cultured unless a scientific risk analysis shows that the risk of harm to the marine environment from the offshore culture of nonindigenous or genetically modified marine species is negligible or can be effectively mitigated. Feed, animal waste, antibiotics, and chemicals used for operations should be monitored to avoid pollution of the surroundings by excess material. The amount of antibiotics required in aquaculture operations can be reduced through vaccination and stress reduction. Methods such as facility siting, netpen design, and acoustic deterrents could be used to discourage predation and injury to predators, and facility siting should consider Essential Fish Habitat and traditional fishing grounds.

6.3.3 Research and Monitoring

The location of offshore oil and gas platforms affords them unique access to the OCS. Platform research and monitoring activities could include those for assessing conditions for alternative energy uses such as wind, wave, or ocean current technologies as discussed in Section 6.2.2. Climate research or research on aquaculture or other marine research could also be conducted from existing platforms. Monitoring for homeland security purposes is another possible use.

6.3.3.1 Description

Oil and gas platforms provide a stable, local base in the marine environment. They provide docking facilities for watercraft (some with landing pads for helicopters), crew quarters, and a power source for operations. Platform size will dictate the room available for equipment as well as additional space (e.g., office, laboratory, or industrial) for a given use.

6.3.3.2 Impacts

For startup use as a research outpost, negligible to minor impacts to the environment, similar to those discussed in Chapter 5, would be expected from supply and crew boats, unless the underwater support structure required modification where disturbance to the ocean floor or attached organisms might occur. By its very nature, any research on marine life is expected to have negligible to minor impact on the surrounding ecosystem since any disturbance upsets the system under study. If the research were concerned with the feasibility of aquaculture operations or alternative energy systems, expected impacts would be those discussed in Section 6.2.3 or Chapter 5, respectively.

If a platform's future use were strictly limited to monitoring, negligible to minor impacts would be expected. Supply or maintenance boats or helicopters would be calling periodically to ensure continued operations. Monitoring could involve the assessment of air and water characteristics and conditions or the tracking of nearby species. Homeland security surveillance equipment might also be employed.

6.3.3.3 Mitigation Measures

Actions to mitigate potential impacts from research and monitoring would be specific to a given project. In all cases, normal procedures such as collection of generated waste for onshore disposal and operation of crew and supply boats or helicopters according to applicable regulations should minimize impacts to the environment.

6.4 OTHER USES

A number of other uses have been proposed for retired oil and gas platforms. Other proposals include uses in areas such as desalinization, education, hotels, recreation, military outposts, staging and supply areas for the oil and gas industry, subsea storage of natural gas or other substances, carbon sequestration, telecommunications, and urgent medical care. While some of these uses may be reasonable, none is projected to occur within the next 5 to 7 years and, therefore, they are not analyzed in this programmatic EIS. Separate, more detailed NEPA analyses would be required for any proposed use of an existing facility.

6.5 NONROUTINE CONDITIONS

Alternate use of existing oil and gas platforms would involve some risk of nonroutine incidents and accidents with the potential to adversely impact the environment. During current operations, OCS operators and lessees are required to report incidents to the MMS, including fatalities, injuries, explosions, fires, losses of well control, collisions, pollution, and other incidents. The MMS tracks, investigates, and analyzes the incident information to identify the causes, trends, and safety concerns. The MMS uses this information to identify appropriate actions to enhance safety and environmental protection on the OCS.

For the potential alternate use of platforms, many of the types of incidents reported to the MMS, such as explosions, fires, and loss of well control, would likely not be applicable due to the cessation of oil and gas production activities. However, the risk of collisions with platforms would continue. In addition to collisions, other hazards would include: (1) industrial hazards similar to those of most large industrial facilities and infrastructure projects, (2) natural events, such as hurricanes and earthquakes, and (3) sabotage or terrorism events.

As discussed in Chapter 5, for any activity or facility, the risk posed by a nonroutine event depends on two factors: the probability (or expected frequency) of the event occurring and the consequences if the event did occur. Both the probability of nonroutine events occurring and the potential consequences if they did occur are project- and site-specific. Therefore, the risk posed by such events must be evaluated on a project-specific basis. A general discussion of nonroutine event risks associated with alternate use of platforms is provided below.

6.5.1 Industrial Hazards

The industrial hazards during alternate use of platforms on the OCS are similar to those of most large industrial facilities and infrastructure projects. The hazards are physical hazards and include working at heights, working on and/or over water, working in confined spaces, working with machinery, and being in the vicinity of falling objects. Under authority established in the OCSLA and pursuant to a memorandum of understanding (MOU) between the two agencies, the MMS and the USCG regulate safety on fixed OCS facilities. The MMS regulates the structural integrity of fixed OCS facilities, and the USCG regulates marine systems, such as lifesaving, navigation equipment, and workplace safety and health. In February 2002, the USCG issued a final regulation that authorized the MMS to perform inspections on fixed facilities engaged in OCS activities on its behalf, and to enforce USCG regulations applicable to those facilities (67 FR 5911–5916; February 7, 2002 [revising 33 CFR 140.103(c)]). The OCSLA also requires that the MMS and the USCG investigate major accidents, deaths, serious injuries, major fires, and major spillages, as well as lesser accidents.

Two of the primary industrial hazards of working on platforms are working at heights and working on or over water. Working at heights and over water may be required during construction activities, during operations, or during maintenance activities. Working at heights can pose a significant risk from falls. In addition, risks are also associated with the use of cranes that are often necessary to support working at heights. Working on or over water can pose a risk of drowning and requires the additional consideration of wind and weather and the availability of buoyancy devices and qualified boat and rescue personnel.

Industrial accidents could result in both worker injuries and fatalities. However, the risks from industrial hazards depend on the magnitude, location, and characteristics of the specific project; health and safety planning and training; and adherence to established regulations and safety and accident prevention and control measures.

6.5.2 Collisions

Collision incident data were reviewed for the years 1996 through 2005 (see http://www.mms.gov/incidents/collisions.htm) to determine the types of collision impacts that would be possible during an alternate use period.

Over the 10-year period 1996 through 2005, 129 collisions with platforms or associated structures were reported, with 3 involving helicopters and 126 involving marine vessels. All of the reported incidents occurred in the Gulf of Mexico. The most commonly reported causes of the collisions included human error, weather-related causes, equipment failure on the vessels, and navigational aids not working on the platforms. In many cases, the collisions resulted in significant damage to the platforms and the impacting vessels.

For the 129 collisions, a number of injuries occurred but no fatalities were reported. The three helicopter incidents all involved helicopters either landing or taking off from the platforms, and resulted in 1 injury. Seven of the 126 marine vessel collisions resulted in injuries, with a total of 46 individuals reported injured. The majority of the injuries involved crew members on the marine vessels.

Of the 126 marine vessel collisions, 5 resulted in explosions or fires on the platforms. During a period of alternate use, the risk from explosions or fires would likely be much lower than the risk that existed during oil and gas production activities.

Nineteen of the 129 collisions resulted in spills and the release of pollutants to the environment. The most common material spilled was diesel fuel from marine vessels damaged during the collision. The two largest spills were estimated to involve 41,600 and 68,100 L (11,000 and 18,000 gal) of diesel fuel and resulted from the sinking of the vessels striking the platforms. Other materials spilled to the environment during collisions included oil, natural gas, hydraulic fluids, and corrosion inhibitors.

6.5.3 Natural Events

There is a potential for natural events to cause impacts to human health and the environment during alternate use of platforms on the OCS. Such events include hurricanes, earthquakes, tsunamis, and severe storms. Depending on the severity of the event, platforms could be damaged or potentially destroyed, resulting in economic, safety, and environmental consequences. Moreover, marine vessels used in constructing, servicing, or maintaining the platforms could also be impacted, potentially resulting in loss of life and the release of hazardous materials (e.g., diesel fuel) to the environment.

The probability of a natural event occurring is location-specific and differs among the three OCS regions considered in this study. For example, hurricanes are much more likely to occur in the Gulf of Mexico and Atlantic regions than the Pacific region. Conversely, earthquakes and the tsunamis that undersea earthquakes can cause are much more likely to occur in the Pacific region. Such differences should be taken into account during project-specific studies and reviews.

6.5.4 Sabotage or Terrorism

In addition to the events described above, there is a potential for intentional destructive acts, such as sabotage or terrorism events, to cause impacts to human health and the environment. As opposed to industrial hazards, collisions, and natural events, where it is possible to estimate event probabilities based on historical statistical data and information, it is not possible to accurately estimate the probability of a malevolent act. Consequently, discussion of the risks from sabotage or terrorist events generally focuses on the consequences of such events.

In general, the consequences of a sabotage or terrorist attack would be expected to be similar to those discussed above for collisions and natural events. Depending on the severity of the event, platforms could be damaged or destroyed, resulting in economic, safety, and environmental consequences. Moreover, marine vessels used in constructing, servicing, or maintaining the platforms could also be impacted, potentially resulting in loss of life and the release of hazardous materials (e.g., diesel fuel) to the environment. The potential consequences of such events need to be evaluated on a project- and site-specific basis.

6.5.5 Mitigation Measures

A number of mitigation measures are expected to be employed to minimize nonroutine event risks during the alternate use of platforms. The primary mitigation measures would be aimed at minimizing the risk of vessel collisions with platforms. Platforms on the OCS are already noted on navigational charts for mariners and are outfitted with navigational aids, such as lighting and sound signals (e.g., foghorns). Maintenance of such equipment and safety measures during alternate use of the existing platforms would contribute to the mitigation of risks associated with nonroutine conditions.

In addition, vessels are generally expected to operate under the International Regulations for Preventing Collisions at Sea (enacted in 1972). These rules require all vessels to duly regard all dangers of navigation and collision, and they specify that mariners are responsible for the safe operation of their vessels, regardless of the navigational situation.

An example of a mitigation measure specific to aquaculture is the locating of netpens further below the water surface to reduce the possibility of damage in extreme weather events such as hurricanes.