



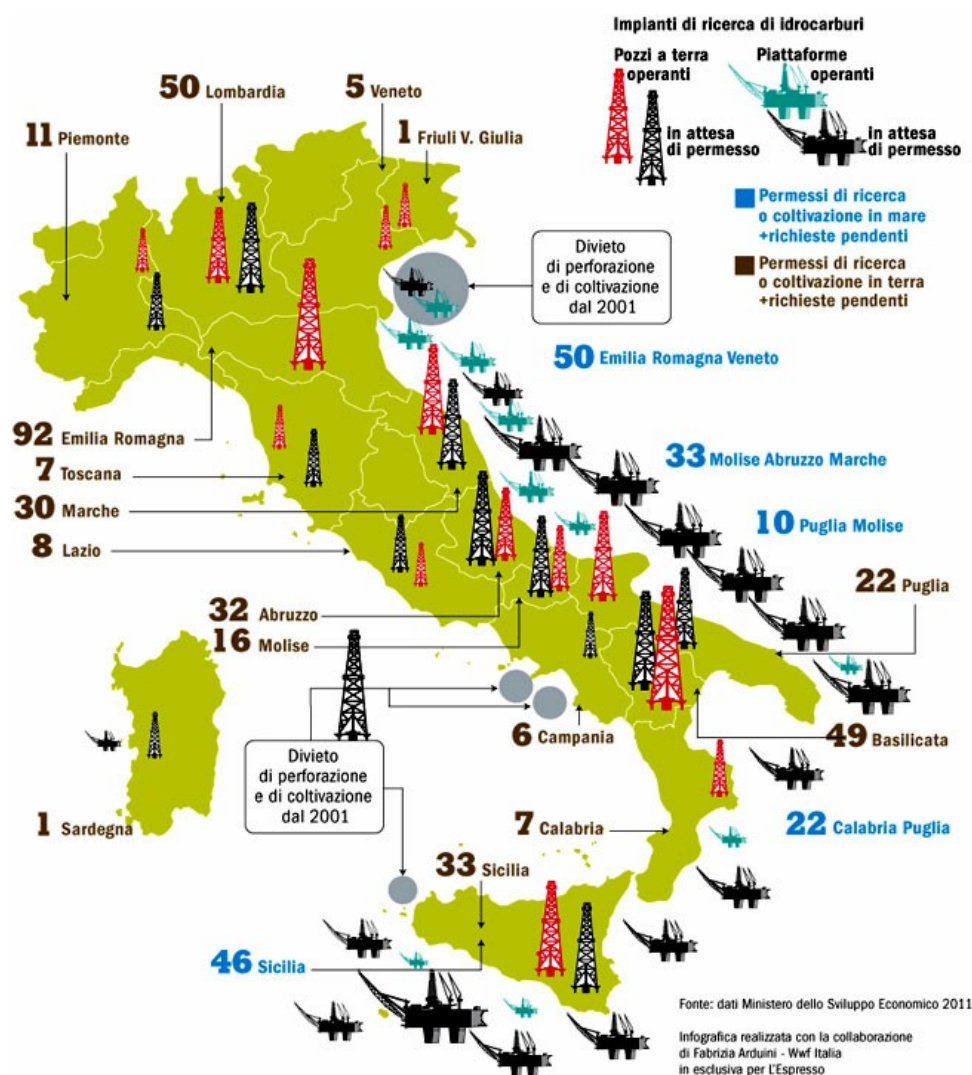
Offshore Oil Exploration in the Mediterranean Sea and impact on the marine ecosystem and on Cetaceans' life.

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This document contains a description of the oil exploration activities in the Mediterranean Sea and their impact on Cetaceans and, more generally, on the marine ecosystem. This description wants to show what is happening in the Italian seas and the impact on environment, public health, fishing economy and tourism. The main Associations for the defense of the environment and Biodiversity, all together promote a sustainable development asking a concrete and responsible action by the Institutions and the Organizations in monitoring and safeguarding the sea sector and health of the whole marine ecosystem.

Since several months, a lot of Italian and foreign Oil Companies are asking the authorization to research hydrocarbons in Italian seas, with particular interest for the Adriatic Sea area and Strait of Sicily.



The hydrocarbons activities are planned different phases, each one linked to a particular environmental impact.

The **first phase** is about the regional geological study, with the elaboration and interpretation of seismic data, in some cases already existing, and acquisition of new seismic data. The methods of seismic reflection foresee, in almost all cases, the use of a compressed air energy source, better known as **air-gun**. The air-gun survey generates a violent acoustic energy pulse which propagates in the subsurface and, by a reflected seismic wave, shows the presence and nature of hydrocarbons in the subsoil. Air-guns are always arranged in array (there are dozens of different sources) and in their surroundings can be recorded peak pressure of about 260db (1 mPa at 1m dB) [1].

It is known that many species of *Cetacea* Order are particularly sensitive to excessive noises, as those generated by military sonar and air-gun, that must be added to the background and the maritime traffic noise. Cuvier's Beaked Whale (*Ziphius cavirostris*) and Sperm Whales (*Physeter macrocephalus*) are among the most susceptible species, and may suffer adverse effects as: discomfort and stress, till temporary or permanent hearing loss sensitivity [2].

This type of noise can shock marine mammals, and get them to a rapid and unexpected surface without adequate decompression, and to death for "**gas and fat embolic syndrome**", death from embolism [3]. The exposure to very high acoustic noises could also produce physiological and psychological trauma (bleeding, stress etc. etc.), in addition to hearing trauma, causing lethal effects.

Once completed the first phase, if an interesting area is found, the **second phase** will plan a temporary **offshore oil well**. If Oil Companies decide to continue oil drilling activities, in the **final phase** will plan the building of a **permanent offshore platform** for extraction activities, that involves the storage and transport of hydrocarbons with land and sea oil field structures, refinery and increasing maritime traffic. Moreover it may be built a refinery on land or sea, for oil hydrogen sulfide purification, often characterized, especially in Italy, by bad quality. The activities associated with these additional phases will go on for decades and constitute an additional source of **noise pollution**, owing drilling activities, and a further source of **environmental pollution**, owing hydrogen sulfide emission and oil drilling muds used (mixtures based on mineral oils, petrol, hydrocarbons, water and synthetic materials, saturated with BTEX -benzene, toluene, ethyl-benzene, xylene-, heavy metals -mercury, arsenic, vanadium, lead, zinc, aluminum, chromium, barium, beryllium, cadmium, copper,

nickel, silver, iron-, in addition to small amounts of radioactive material, such as isotopes 226 and 228 of the radon [4-6]) and for the inevitable hydrocarbons' oil and gas emissions and losses during the extraction. If any accidents and explosions (very frequent also in Italy) will happen, the situation would be disastrous.

Therefore, the environmental contamination will cause **biological magnification** and **bio-accumulation** along the food chain, where Cetaceans represent the top as **sentinels of marine ecosystem health**.

The maritime traffic, because of the different activities during the various phases, is considered a disturbing factor for Cetaceans. In the Mediterranean Sea many Cetaceans' species every years suffer **collisions with ships**, which are a constant anthropogenic causes of death. Fin Whale (*Balaenoptera physalus*) and Sperm Whale (*Physeter macrocephalus*) are species included in IUCN Red List (International Union for Conservation of Nature), respectively as Endangered and Vulnerable. These marine mammals, like all Cetaceans, surface periodically to breathe and may remain at the surface for long periods. This behavior, together with the huge body that slows down their reaction time and movements, is among the causes that more expose Sperm Whale and Fin Whale to collisions [7.8]. The intense maritime traffic, in addition to the collision risk, is responsible for a series of problems including pollution, noise and habitat degradation.

The oil exploration areas have a strategic importance to many activities that characterize the complex and extraordinary Cetaceans' life (feeding, foraging, nursing, reproducing, migration, socializing, resting, etc. etc.), disturbed by anthropogenic activities planned. Stress is a dangerous factor that causes serious damages to Cetaceans' physiology, even causing death. In most cases of Cetaceans' stranding, noise and environmental pollution factors represent constant con-cause of marine mammals death.

Instances and Environmental Impact Studies (SIA -Studio di Impatto Ambientale-), related to oil exploration projects, try to limit the real impact through sea partition area (particularly for the Adriatic sea, a close sea considered an unique natural system), without carefully considering total cumulative impact for the entire marine ecosystem. In fact for its physical nature of "fluid", the **sea is a moving and dynamic system**.

So trying to minimize and mitigate **cumulative impacts** is totally impracticable. In fact, even at a distance of time and space, the effects inevitably propagate throughout the entire marine

ecosystem and persist for the sea characteristics. Particularly in the Italian seas, where oil drilling activities are allowed to **a few tens of miles from the coast** (12 miles from Marine Protected Areas -AMP- and 5 miles from coastal baselines). So hoping that the consequences that affect an area does not extend into adjacent areas or in other more distant areas, Oil Companies demonstrate that don't value carefully the characteristics of the marine ecosystem and the importance of its **Biodiversity**.

Moreover, according and respecting the **precautionary principle** (Rio Conference "Earth Summit" 1992), the oil exploration activities could not be allowed without a complete knowledge of all consequences and impacts with certainly, **in short and long-term, direct or indirect**, on the marine ecosystem and in particular on Cetaceans, group of endangered species protected by a national and international regulation for their protection and conservation.

Finally, once again in line with a precautionary approach, in the various research projects SIAs (Environmental Impact Studies), there is neither a description about a recovery plan of the area after any environmental damage, nor a preventive plan of economic budget and professional competence of the same Oil Company project.

So it is necessary that the Ministries of the Italian Republic, before authorizing oil research activities, check that the Oil Companies' SIAs (Environmental Impact Studies) and VIA (Valutazioni di Impatto Ambientale -Environmental Impact Evaluations-) are certified:

1. An adequate and detailed documentation about the presence and activities of Cetaceans in the oil exploration project area, in adjacent areas and in Mediterranean Sea (most of the Cetaceans are pelagic mammals, that live swimming in the sea according to the presence of prey, connected to seasons and marine currents). The deficient documentations and studies about Cetaceans' population in some marine areas, doesn't testify the real absence of these animals in the the oil exploration project areas. It may be a good reason to adopt a precautionary approach for maximum protection and respect of Cetacean habitat and their potentially presence. This deficient documentations must be considered neither a justification nor an authorization to work with the conviction not to cause impacts on the marine ecosystem. Moreover, offering Oil Company navigation structures as useful platforms to increase the documentation about the presence of Cetaceans, is quite bizarre in

relation to the incompatibility between the presence of these specimens and the impact of the planned activities.

2. A detailed report on the environmental consequences, with an evaluation of the pollution (chemical, atmospheric, noise etc. etc.), directly or indirectly produced in the oil exploration project area, in adjacent areas, and in the Mediterranean Sea in short and long-term. With a report that shows if the Oil Companies have the economic budget and the technical requirements to recover affected areas from accidents and oil and gas spills. So it should be necessary a simulation that can verify the complex oil activities and the operations to save the area and the ecosystem.

3. A chronological report about previous oil spill accidents by the Oil Company and by other Companies in the oil research project areas, in adjacent areas, in the Mediterranean sea basin and in general in the World. This report is indispensable to verify, clearly and exactly, the technical-scientific competences and the reliability of the Oil Company previous experiences. This will state if the impact of new activities will be added to previous or concurrent ones.

4. An updated and complete description of all legislation regulating and protecting the marine environment, its inhabitants and more in general the ecosystem. The description of all the safeguards and mitigation measures during operations and in the meantime the description of technical-scientific requirements to respect the current legislation.

5. A detailed report about the start, the activity and the end of Oil Company works, that shows in detail the performance of the entire process (chronology of operations, techniques used in performing the tasks, resources used, ship inspecting routes, operating personnel etc. etc.). This information is necessary to let local community and institutions monitor and intervene immediately in case of accidents during the work and in case of various kinds of interference in the ecosystem (for example, the National Emergency Task Force -unit national emergency- to intervene in case of Cetaceans recovery or stranding) and keep the appropriate measures to protect local activities (fishing, tourism, fish farming, shipping etc. etc.).

6. The transparency of qualifications and *curriculum vitae* of all those involved in the oil

exploration, in the installation of temporary or permanent offshore oil platform or well and in extraction, transport and storage of oil and gas production and generic pollution, to evidence their training and operational experience. These persons are for example: the MMO (Marine Mammal Observers), in fact the Cetaceans observation and monitoring are an extremely difficult practices requiring considerable experience and expertise; the technical staff operating with air-guns; the technical staff operating to check up the equipments and ships; the captain and commanders of several ships and shipboard personnel monitoring shipping routes; staff writing and documenting Environmental Impact Studies (SIA) etc. etc.

7. The exact location of offshore oil platform, wells (temporary and/or permanent) and refinery of the project, the composition and the estimated amounts of oil drilling muds and fluids used, the estimated amounts of pollutant emissions, how and where is the storage of waste and pollutant materials etc. etc.

These considerations and questions arise because of deficiency or lack (in references of the SIA/VIA and during the execution of oil procedures), of the above conditions, which are necessary and essential for the protection and conservation of the delicate ecosystem and Biodiversity, first of all the Cetaceans.

In the Mediterranean Sea each year are discharged about 150 tons of oil (the highest density of tar offshore in the World: 38 mg/m² -WWF data-) and the history of the sea basin contains a lot of incidents related to the activities of hydrocarbons extraction, transportation and refining.

For these reasons it was not possible to find a direct connection but only a possible indirect connections, between oil exploration activities and the **stranding of seven Sperm Whale** (*Physeter macrocephalus*) in **December 2009** in the north shore of **Gargano** (between Cagnano Varano and Ischitella city). The same happened for the mass stranding of **Cuvier's Beaked Whale** (*Ziphius cavirostris*) on **Corfu Island** shore and **Calabrian shore**, in **November/December 2011**, in the same time with air-gun oil activities by three ships (Princess, Thor and Thor Guardian Server) from Malta and operating offshore Brindisi and Monopoli authorized by British Northern Petroleum Company, and military exercises with sonar. These are just two of the numerous accidents of Cetaceans stranding, even of individual animal, documented in the Adriatic, Sicilian and Mediterranean Sea shore,

potentially associated with this type of activity.



One of the 7 Sperm Whales stranded December 2009 on the Apulian coast (photo © G.Pietroluongo).

It should also be considered that recently the international scientific community during the annual meeting of the **American Association for the Advancement of Science (AAAS)**, expressed in favor of an ethic respect for the rights of Cetaceans as "non-human persons" with extraordinary intelligence and self-awareness. The first of these rights is the legally enforceable right to life.

So, before releasing permissions and authorizations for oil research activities, it is necessary more completeness, transparency and correctness in the authorization process and related Environmental Impact Studies and Evaluations (SIA, VIA).

So this document asks to the **national and international Organizations and Institutions in charge**:

- monitoring and regulating marine activities;
 - protecting pelagic species and habitat;
 - evaluating environmental impacts;
 - authorizing oil research activities
- and in particular:

- Ministries of the Italian Republic;
- I.S.P.R.A. (National Institute for Environmental Protection and Research);
- Si. Di. Mar. (Marine Defense System);
- ARPA (Regional Agency for Environmental Protection);
- ISMAR (Institute of Marine Science);
- General Command of the Harbor;
- Italian Navy;
- Italian Naval League

to get involved in precise and detailed controls and measures to protect and save effectively and practically the ecosystem and its Biodiversity.

Activities that go on for hours and days and can persist for years, may inevitably be disturbing with pollution factors the precarious state of health and conservation of Cetaceans. Especially if the ships, the equipments and the platforms for the oil activities operate in **a vast area where Cetaceans have been living ever since.**

Allowing these activities without a transparent, complete and correct operating program and without involving technical-scientific national and international community in the study, documentation and restoration of habitat and Cetaceans stranding, it means to play dangerously with an announced disaster with a great risk for the entire ecosystem, sometimes irreversible, which inevitably will be reflected on **public health.**

Signers:

Prof.ssa Maria Rita D'Orsogna, California State University at Northridge

ENPA Ente Nazionale Protezione Animali

Animalisti Italiani Onlus

Sea Shepherd Conservation Society Italy

The Black Fish

Centro Studi Cetacei

Ketos

Aeolian Dolphin Research

Centro Ricerca Cetacei

Prof. Franco Tassi, Comitato Parchi Italia

Federazione Nazionale Pro Natura

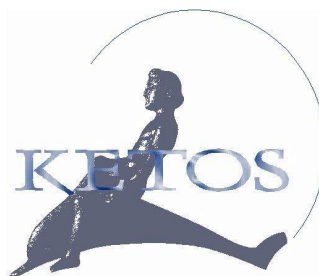
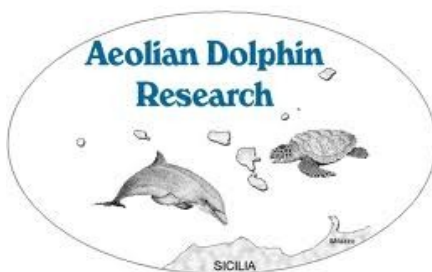
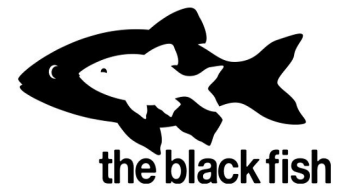
Pro Natura Mare Nostrum

Bottlenose Dolphin Research Institute

Istituto per gli Studi sul Mare

LIDA Lega Italiana dei Diritti dell'Animale

OCEANA Europe



Pro Natura



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