
THE INTERNATIONAL LEGAL PROTECTION OF THE MARINE BIODIVERSITY

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ABSTRACT

This is an article about the international environmental law relating to the protection of the biological resources of the oceans. It was conceived to address the importance of environmental impacts when the marine biodiversity is used as a raw material for industrial production, from the analysis of international legal instruments created for the sustainable management of biological resources. This legal order is thus composed of various normative instruments, in particular the Convention on the Law of the Sea, which, in line with the Convention on Biological Diversity, offers the basic provisions for the environmental protection of the oceans. A systematic study of this international environmental legal order was therefore carried out in order to demonstrate the need for the continued development of effectiveness mechanisms regarding the measures taken and the adoption of new measures that are more adapted to environmental issues based on illegal fishing, unregulated fishing of straddling and highly migratory stocks, overfishing in areas of national jurisdiction, predatory fishing on the high seas and uncontrolled prospecting of marine genetic heritage.

Keywords: International Environmental Law; Law of the Sea; Protection of marine biodiversity.

*LA PROTECTION JURIDIQUE INTERNATIONALE
DE LA BIODIVERSITE MARINE*

RÉSUMÉ

Il s'agit d'un article sur le droit international de l'environnement relatif à la protection des ressources biologiques des océans. Il a été conçu pour traiter de l'importance des impacts environnementaux lors de l'utilisation de la biodiversité marine comme matière première de la production industrielle, en analysant les instruments juridiques internationaux créés pour la gestion durable des ressources biologiques. Cet ordre juridique est ainsi composé de divers instruments normatifs, notamment la Convention sur le droit de la mer qui, avec la Convention sur la diversité biologique, fournit les dispositions fondamentales de la protection environnementale des océans. Une étude systématique de cet ordre juridique international environnemental a été donc réalisée pour démontrer la nécessité du développement continu des mécanismes d'efficacité des mesures prises et de l'adoption de nouvelles mesures plus adaptées aux enjeux environnementaux fondés sur la pêche illicite, la pêche non réglementée des stocks chevauchants et grands migrateurs, la surpêche dans les espaces de juridiction nationale, la pêche prédatrice en haute mer et la prospection non contrôlée du patrimoine génétique marine.

Mots-clés: *Droit international de l'environnement; Droit de la mer; Protection de la biodiversité marine.*

INTRODUCTION

The heterogeneity of the sea ecosystem structures is the origin of a very wealthy marine diversity whose evolution took an independent road comparing to the one taken by the terrestrial biodiversity. In fact, while the biological terrestrial diversity gradient obviously presents maximum concentration in the tropical region and progressive impoverishment towards the poles, the marine biological wealth, to the contrary, seems to be at its most in temperate zones. The seas in those zones, where the water is colder, present a wide variety of planktons, especially in the outcropping and ocean current areas. On the other hand, the seas in the tropical zones are significantly poorer due to reduced plankton biomass.

All human activity on the environment inevitably causes current repercussions. Those changes to the natural organization of ecosystems may be significant or non-significant. The International Law tries to provide instruments to avoid eventual significant harmful repercussions as all human work on natural raw material inevitably result in impact on the environment. The same reasoning is valid for human use of marine biological resources. Any work in the sea implies in changes to the natural environment. Actions performed by men in the sea generate important disturbance to the marine environment, which is rich, but fragile. Damages to the marine biological resources are characterized by their severity, which is established in comparison to the ecological, social-economical and human plans. Once just a minimum part of those disruptions is naturally absorbed, the ocean is under threat, especially near the coasts, where human activities are more intense.

In order to avoid the degradation of the marine environment, it is convenient to adopt an approach based on the principles of precaution and prevention of significant damages instead of adopting a procedure to correct damages done. That approach necessarily implies in the adoption of precaution measures by the States, undertaking environmental impact studies, developing a less invasive production technology and creating a global action system to fight factors that harm the marine environment.

The most important source of significant damage to the marine environment is in coastal zones, where the greatest majority of the world population lives. Those zones have highly complex productive habitats

that are important for human settlements, for the development and the livelihood of local populations. Over half of the world population lives less than 60 kilometers far from the coast and that proportion may get to three quarters by 2020. When talking about the fight against degradation of the marine environment, urgent measures shall be adopted on the terrestrial territory of the States. However, it was due to environmental disasters in the sea¹ that it was possible to raise global awareness of the severity of the maritime environmental issue. From that awareness, the States started to create an international legal system dedicated to the environment that gradually transformed the legal standards in force by then and established new standards generally valid on the subject.

In recent years, halieutic sea resources have considerably increased. The legislative provisions in the International Environment Law set State obligations in what concerns the use and conservation of marine biological resources. However, the management of those natural resources, including standardization, application of rules and efficient conservation measure follow up is still a challenge in several areas. That is why some marine fishing resources are over explored.

The challenges of the International Marine Environmental Law regarding biological resources are concentrated on non-regulated fishing, on excessive equipment, on oversized fleets, on the use of flags of convenience to overcome fishing regimes, on the use of predatory fishing technology, on the poor databases on fish stocks and on the need to reinforce the international cooperation mechanisms.

1 MARINE BIODIVERSITY AT THE INTERNATIONAL ENVIRONMENTAL PROTECTION LEVEL

Accidents with oil tankers, more and more frequent and severe, mobilized the public opinion in developed States so as to create a favorable negotiation scenario to set up the International Marine Environmental Law. A few weeks before the adoption of the Resolution on accidental marine pollutions, on December 3, 1968, the General Assembly of the United Nations, in the same session, approved Resolution 2398 (XXIII) on environment issues that forecasted a conference of the United Nations on

¹ On March 18, 1967, the grounding of the *Torrey Canyon* oil tanker in the high seas off the British coast resulted in the first important black tide.

human environment in 1972. That conference took place in Stockholm and addressed in very general terms the marine environment issue. (JAQUES, 2014, p. 306)

The Stockholm Declaration states in principles 2 to 7 that the planet's natural resources have to be conserved by means of a formal planning, coherent use and careful management carried out by the States that hold territorial sovereignty. That means that the human being has the particular responsibility to safeguard and correctly manage the different components of the biological heritage consisting of the wild flora and fauna and their ecosystem. Thus, in what concerns the marine environment, the sea's non-renewable natural resources have to be explored so as not to be subject to depletion and the States shall take all measures available to hinder maritime pollution. In fact, principle 7 of the Stockholm Declaration establishes that:

The States shall take all possible measures to hinder pollution of seas by substances that may endanger human health, harm biological resources and the life of marine organisms, compromise entertainment possibilities or hinder other legitimate uses of the sea.

This important international legal instrument evidences the need for the States to apply world strategies in terms of fishing in harmony with environmental conditions, that is, the preservation of the marine environment, in general, and the fight against marine pollution, in particular. All those issues shall also be subject to continuous follow up by each one of the States. (KISS; SICCAULT, 1972)

The marine environment, including surrounding coastal zones, is formed by a set that consists in an essential element for life on the planet. That environment depends on sustainable exploration through the use of less destructive production technologies. The International Marine Environmental Law is the foundation on which national efforts shall be based to sustainably protect and value the marine environment, including its natural resources. That assumes the creation of new cooperative management strategies for seas, oceans and coastal zones at a national, regional and global level. Those cooperation mechanisms shall be

simultaneously planted in the principles of precaution and prevention. In addition to that, the international cooperation for environmental protection shall reinforce the obligation to transfer the relevant technology and the necessary financial means so that developing countries can also effectively contribute for the international environmental objectives.

Montego Bay Convention on Law of the Sea, dated December 10, 1982, achieved the global maritime legal approach, reinforcing that marine environment protection is thoroughly ruled. That convention meant the beginning of a crucial stage of International Marine Environmental Law. It expressly brought to the marine environment what had been foreseen in a more general way in the Stockholm Declaration. The exercise of sovereignty by a State over its territory's natural resources shall not harm another country's environment. In face of significant risks regarding transborder environmental damages, it was set forth that the Countries have the obligation to cooperate in order to achieve the objectives of the convention. That obligation is a true general principle of International Law. In contrast to previous environmental standards, Montego Bay Convention failed to present new elements. However, the general obligation of cooperation is legally important once it is systematically recalled by the international jurisprudence². (BEURIER, 2014, p. 1.618)

In fact, article 192 of Montego Bay Convention imposes a general obligation for the protection and preservation of the marine environment, whatever the source may be. Article 194, § 5 states that the measures taken include the ones that are necessary to protect and preserve rare or fragile ecosystems, as well as the habitat of species and other declining, threatened or endangered marine organisms.

The countries shall take all the measures for the activities under their jurisdiction or control to cause no harm to other countries and to their environment. Article 235 acknowledges the countries as responsible for the protection and preservation of the marine environment and forces them to develop resources to compensate damages and other compensations.

² The obligation to cooperate and preserve the marine environment was reaffirmed by the International Tribunal for the Law of the Sea in the case of the MOX Plant.

2 INTRODUCTION OF EXOTIC SPECIES INTO THE MARINE ENVIRONMENT

Consciously or not, men have often mixed several living species. Regrouping may result in significant disturbance to the balance of ecosystems. In what regards the marine environment, specie regrouping has frequently led to important ecological unbalance. Liquid bulk carrier ballasting and deballasting activities by oil tankers are the main cause for billion tons of seawater to be changed from one ocean to the other. That promotes the broad mixture of plankton species and, since mid-1980's, worldwide proliferation of invading exotic species to the detriment of native species, what may considerably change the food chain. Nowadays, the introduction of exotic species is considered the second cause of biological diversity losses on a global scale. (BEURIER, 2014)

An international regulation was developed by the countries in order to expressly set forth an absolute ban regarding any type of introduction of exotic species that may endanger the survival of endemic species. In this context, Montego Bay Convention addresses the issue by defining in article 196, § 1 that the Countries shall take all the necessary steps to prevent, reduce and control the intentional or accidental introduction into a part of the marine environment of strange or new species that are able to cause considerable and harmful changes.

The Convention of Rio de Janeiro on biological diversity signed on June 5, 1992, s in article 8, in addition to the ban and the control of the introduction of exotic species of the natural environment, the possibility to eradicate those species so as to avoid uncontrolled reproduction. This provision legally authorizes the extinction of living resources in case it is necessary in order to maintain the ecological balance, which seems surprising from an environmentalist perspective. Anyway, that authorization seems quite paradoxical once the opportunist specie only comes out to be dangerous for the environment when it has penetrated enough in a territory so as not to be subject to eradication anymore.

The international regulation, which was developed to deal with any introduction of exotic species that can threat the survival of endemic species, insists in the need that the countries foresee the invasion of the species for the fight against such phenomenon to be efficient. As the Convention on Biological Diversity sets forth, the Convention of Bern

dated September 19, 1979 and regarding the conservation of wild life and natural environment in Europe, in article 11, § 1, “b”, forces the member countries to strictly control the introduction on non-native species into their territories. (BEURIER, 2008, p. 8)

The international management actions regarding the introduction of exotic species refer to prevention or control. In the face of the threat that those invading species represent for the ecological balance of the countries, it is possible to recognize the mitigation and accommodation strategies. The first one consists in reducing the chance of a bad specie to appear in nature by means, for example, of quarantine measures, while the second one aims at limiting the significant economic impacts when exotic species are introduced, changing a culture to decrease the severity of the consequences of the biological invasion. (FRÉSARD, 2011, p. 490)

The invading marine species are an important threat to ecosystems and the maritime navigation is recognized as the main introduction vector into the local environment. The International Convention for the Control and Management of Ships’ Ballast Water and Sediments was adopted in London in 2004. It is an international treaty that aims at hindering the mixture of harmful exotic species from one region to the other, setting legal control and management standards for ships’ ballast water and sediments. The objective of the London Convention is to allow for the efficient control of the transportation of exotic species present in coastal sediments from an ecosystem to the other, where they would be potentially harmful, with no use of chemical products. The idea is to limit transfers at the most due to the obligation to reject ballast water the least frequently as possible to prevent, reduce or eliminate transborder transference of harmful marine organisms.

The coastal State shall update information on less dangerous areas at its coast where the operation of water rejection can be carried out. A deballasting registration system shall consign rejection dates, places, quantities and external conditions. The registration is maintained and updated by the captain. The States must guarantee suitable sediment reception facilities at the ports and terminals, where ballast tanks cleaning or repair shall take place. It concerns both the management of ballast water and sediments in appropriate facilities at the port and the organization of ballasting and deballasting in more ecologically suitable maritime zones.

Pursuant to the text of the London Convention, it is also possible to adopt a constant flow method that consists in pumping the ballast water until it overflows in order to allow for permanent renovation of species present along the areas visited by the ship.

The introduction of exotic species into a different marine environment has caused significant damages all over the world. Although specific conventions have been signed, such as the London Convention, the reality shows that the volume of biological invasions is still considerable.

3 MARITIME FISHING

The marine biodiversity, both at the level of ecosystems and genes, is a set of natural resources that support a range of human activities. Fishing is one of the most important activities. (REVÉRET; DANCETTE, 2010) Sea biological resources are a vital source of protein for the populations of several countries. In addition to that, the use of those resources is highly important for traditional and indigenous groups. In fact, that natural heritage is on the base of nutrition and it means livelihood for millions of people, offering better opportunities to meet nutritional and social needs, especially in Southern developing countries.

Fishing, that until de 1980's was done in an unprecedented continuous growth rhythm, is currently stagnated. Annual captures are about 85 million tons of fish and crustaceans, of which 95% come from waters under national jurisdiction and that has been enough to substantially contribute for degradation of the marine environment due to overfishing, the rupture of biotic balances and the destruction of sea floors by trawling. (BEURIER, 2014, p. 1.615) Indeed, fishing activities in the areas under national jurisdiction are confronted to serious problems, notably the excessive exploitation of fishing areas, the degradation of marine ecosystems, the illegal incursion of foreign ships, excessive equipment and the exaggerated size of the fleets, the use of non-selective fishing technologies as well as the lack of reliable databases. Despite (or because of) all those problems, the productivity of international fisheries increased almost five times in the last decades.

The global fishing effort has led, since the 1950's, to incredible productivity of marine biological resources, but also to 60% overfishing

of tradable species, with serious consequences. In a context of economic exploitation of those resources beyond their sustainability limits, when the available fish gets more and more rare and difficult to find, there is such a productivity decline that, between 1970 and 2000, the average annual captures went from five tons to about three tons per fisherman, which corresponds to a 40% decrease comparing to previous data. Besides the large number of vessels and fishermen operating in the oceans, to many regarding the available biological resources, the use of predatory technologies can also explain the depletion of fish resources. In fact, fisheries are often selective in what concerns the species they target. However, those activities fail to consider accidental captures – responsible for impressive waste – and, consequently, the loss of species having vital ecosystem functions. To have an idea of that predatory waste, accidental captures represent between 25% and 30% of total fisheries. (REVÉRET; DANCETTE, 2010, p. 83)

Despite the dimension of above mentioned problems, marine conservation has only become a global challenge recently. Montego Bay Convention creates an international legal system for oceans and seas, setting forth detailed rules that affect all marine uses, especially in what concerns access to their natural resources. That convention was developed to reach protection goals for oceans, including the preservation of biological resources. The Law of the Sea, which was by then a legal order of the surface itself, was developed after that in a multidimensional sense in which the exploitation and the exploration of sea beds start to be considered. It was inevitable that the right to use and preserve marine fishing resources became an integrating part of that new Law of the Sea. (DOUAY, 1983) Montego Bay Convention gathers in one only international treaty the customs related to the uses of the oceans and simultaneously introduces new legal regimes, always taking contemporary concerns into account. Provisions in the Montego Bay Convention, in what regards the marine biological resources in the different legal regimes, define the obligations of the contracting parties regarding the conservation and the use of those natural resources.

4 HIGH SEA FISHING

Montego Bay Convention maintains the principle of fishing freedom beyond the limits of national jurisdiction, but that freedom is mentioned in fifth place in article 87:

The high sea is open to all countries, may they be coastal or not. The freedom of high sea is exercised according to the conditions set forth in the provisions of this Convention and in the other International Law standards. It encompasses, *inter alia*, for coastal or non-coastal countries: the freedom of fishing according to the conditions in section 2.

Section 2 of part VII of Montego Bay Convention mentioned herein is dedicated to the conservation and management of the biological resources in the high sea. This section recognizes in article 116, “a” that the nationals of all Countries have the right to fish on the high seas according to their conventional obligations, which means that the Country can comply with its obligations in terms of oceanic navigation control of fishing vessels that fly its flag. The members of the Montego Bay Convention shall take conservation measures regarding fish resources in relation to its citizens. It is the same legal solution in article 118, pursuant to which the States shall cooperate for the conservation of biological resources in high seas. The States whose citizens fish in the same area or fish identical biological resources shall negotiate in order to take the necessary measures for the conservation of those natural resources. That cooperation affects not only the States that fish the same species, but also those who capture different stocks in the same region and that could overfish the species associated to the desired ones. The member States that are part of those negotiations impose conservation standards on their citizens with which they agree.

Regarding the conservation of biological resources in the high seas, article 119 of the Montego Bay Convention forecasts that, when the acceptable volume of captures is set, the Countries shall make it so that fisheries are within sustainable optimal yield limits. Thus, the Countries shall define the acceptable volume of captures for the species captured in the high seas in order to impose to its citizens the measures in favor of the rational management of stocks. Those measures shall be based on

the best scientific evidence available in order to insure sustainable optimal yield with no discriminatory effects on any fisherman. The objective is to maintain and reestablish the stocks of the utilizable species at levels that secure maximum constant yield in face of relevant ecological and economic factors, including the interests of developing countries. In several occasions, Montego Bay Convention refers to cooperation among countries by means of sub-regional, regional or global fishing organizations.

In fact, States fishing on the high seas shall cooperate for the conservation of biological resources through the creation of international fishing organizations. From the 1950's, the number of such organisms increases quickly due to the vital commitment between the States for the conservation of resources, but also as a result of the efforts undertaken by the Food and Agriculture Organization of the United Nations in face of the development of an homogeneous system for international fishing.

International fishing organizations are aimed at adopting, by decision of member States, legal standards for the development of sustainable fishing that are able to maintain constant optimal yield for fish stocks. The technical competence of the international fishing organizations encompasses competence due to the fishing zone and the fish species. That double competence possibility is due to the objective of the organization: to manage the biological resources of a restricted area or to manage well one or more species in the marine assembly. That is the reason why it is possible to separate the organizations per area³ and per species⁴.

Most of the ocean is covered by a network consisting of tens of international fishing organizations whose management competences may be highly variable. Its normative competence permits the establishment of a certain level of conservation rules for the halieutic resources and the assignment of fishing quotas to member States for sustainable exploration. Once fishing usually uses private vessels, member States in an international fishing organization shall introduce the content of those standards into their national legal order for fishermen can be civil and criminally liable.

Since 1984, the Food and Agriculture Organization of the United Nations has been trying to make States accountable when adopting a worldwide fishing management strategy. That organization developed the notion of responsible fishing in 1991, as opposed to widespread overfishing.

3 For example, the Western Central Atlantic Fishery Commission (COPACO).

4 For example, Atlantic Ocean Tropical Tuna Tagging Program (ICCAT).

Under its support, an agreement was signed in 1993 to force fishermen respect international conservation standards, notably the ones that forbid fishing vessels to replace the flag, which is widely done by the States whose fleets can only be used far from their over-explored coasts. As there must be a substantial link between the fishing vessel and the Country that grants to it its flag, the 1993 agreement makes the State of the flag responsible for the crimes committed by fishing vessels that fly it. The vessels shall carry an authorization and all the fishing permits for its activity to be legal. Two years later, a code of conduct for responsible fishing was approved at the level of that same organization. That code guides the States into eliminating their excessive fishing capacity, but it also recalls the obligations of the flag country regarding the control of fishing vessels on the high seas or in foreign economic zones.

Except for the small pelagic fish, the main fishing resource on high seas consists in tuna fish, whose annual captures reach 500,000 tons. From the total amount of species utilized by high sea fisheries, 44% are considered overfishing and 30% as used at the maximum sustainable. Although the volume of captures on high seas is not low, captures in the coastal sea represent up to 95% of the result of worldwide fishing. (BEURIER, 2014)

5 COASTAL FISHERY

Thus, Montego Bay Convention recognizes the freedom of fishing on high seas, although limited by legal standards that force the States to cooperation, may it be direct or by means of international fishing organizations. Since the 16th century, it is commonly accepted that fishing on the high seas is totally free. The freedom of fishing is seen as the translation of the fundamental idea of the sovereign equality of the States. If the customary origin of that freedom was based on the idea that fishermen have equal rights on the high seas, the 1958 Geneva Convention on the high seas recognized in articles 6 and 7 the special interest from coastal States to maintain and explore resources in the high seas adjacent to the territorial sea, incorporated to the customary International Law by the decision made by the International Court of Justice in the case of fishery in Iceland. Thus the status of coastal State is a guarantee of advantages

justified by the sovereign exploitation rights over the territorial sea and it consequently implies in the need to protect those biological resources. (LE HARDY, 2002)

The assignment of an exclusive economic zone to coastal countries is, no doubt, one of the most important innovations brought by the Montego Bay Convention. This legal regime has been able to unify the use mechanisms regarding species that are ecologically distant. That zone can be unilaterally demarcated up to 200 miles from baselines by the coastal country, which protects the group of halieutic resources at its coasts thanks to its internal regulations. Thinking in a systematic way, no privilege regarding fisheries on the high seas could reasonably be granted to the coastal state for the creation of an exclusive economic zone. According to the principle of equality, the coastal State is a fishing State among others. However, article 116, “b” in the Montego Bay Convention establishes that the freedom of fishing on the high seas is performed under a reserve of coastal States’ rights, obligations and interests, referring to article 63, § 2 and articles 64 to 67 of the same convention. The first provision regards fish stocks both in a coastal State’s exclusive economic zone and in a sector of the high sea adjacent to that zone. The coastal States and the fishing States in the high seas shall make a direct effort or by means of an international fishing organization to reach an agreement over conservation measures regarding straddling stocks. Those reserves refer to the stocks of straddling fish, large migratory fish, marine mammals and diadrome fish⁵.

In the legal regime of the exclusive economic zone, the Coastal State has sovereign exploration and use rights, but it shall conserve the resources found there, that is, it is competent to manage the biological resources of the water column. In the exclusive economic zone, the Coastal State is granted vast prerogatives to guarantee the preservation of the marine environment according to article 56, § 1, “b”, iii. The conservation of halieutic resources assumes a sound environment. For that reason, the coastal State has a jurisdiction regarding the protection and preservation of the marine environment.

The coastal State is sovereign to unilaterally set in its territorial sea the legal use and conservation regime for biological resources. In case a

⁵ The Montego Bay Convention restated the fundamental role of the States in water courses where anadroms reproduce or where catadromes spend most of their lives: they are the key stakeholders in what regards those stocks and they are responsible for managing them.

third party vessel carries out unauthorized fishing, passing by the territorial sea is no longer harmless. In fact, according to article 21, “e” and “f”, that focuses on the prevention of violations of the domestic law on fishing and the preservation of the marine environment, the coastal State can control the harmless passage of vessels on its territorial sea. Thus, the Montego Bay Convention allows the coastal State to adopt national regulations to preserve the environment within maritime spaces under its sovereignty, that is, in inland waters and territorial sea, and the Convention recognizes jurisdiction over exclusive economic zone.

The coastal State can inspect a foreign vessel to verbalize a violation to its national right committed within its maritime zones under its sovereignty and jurisdiction. In case of such a violation, it may attribute to proven facts the corresponding legal action, according to its internal legal order. The coastal State can even, in order to preserve the natural resources in its exclusive economic zone, create a specific legislation over navigation within protected marine areas, since the authorization of the International Maritime Organization is obtained.

According to a special system for the legal regime of the exclusive economic zone, the coastal State shall set the acceptable volume of captures by means of an internal regulation. The coastal State is competent not only to take protection measures, but also to use the biological resources in its exclusive economic zone. The objective of setting the acceptable volume of captures is simply to avoid overfishing fish stocks and favor its optimal exploitation. Due to article 61, that use shall insure a maximum constant yield.

After unilaterally setting the acceptable volume of captures, the coastal State shall check its capacity to exploit the halieutic stocks from its exclusive economic zone. Pursuant to article 62, § 2º, if the fishing capacity exceeds the acceptable volume of captures, the coastal State shall limit its citizens’ fishing efforts. In that case, foreign fishing cannot be allowed. If the coastal State may conclude that its capacity is equals to the acceptable volume of captures, it has achieved maximum constant yield. The coastal State shall not allow its fishermen to increase their fishing effort, neither foreign fishing. But, when the fishing capacity is lower than the acceptable volume of captures, the coastal State shall authorize other States, by means of agreements or other arrangements and according to its internal

regulations, to exploit the remaining acceptable volume of captures. In that last case, foreign fishermen are previously authorized, by means of fishing permits, to capture the coastal State's remainders, within legal limits related to conservation measures imposed by the last one. Those fishing permits refer to the kind of fishing, the mandatory provision of local fishing development, the definition of authorized species, the quotas per species or group, as well as the duration of the campaigns, setting the sizes for the first capture or minimum weights authorized for each species, fishing area and mode regulation, the types of artifacts and how to implement them, as well as the size of authorized vessels and even the limit of load on board. (BEURIER, 2014, p. 1.337)

Pursuant to article 63, when a halieutic stock is in the exclusive economic zones of several coastal States, they have to make an effort, directly or by means of appropriate sub-regional or regional organizations, to reach an agreement on the necessary measures to guarantee the conservation of those fish populations. When the fish stock is found both in the exclusive economic zone and in an adjacent sector to that zone, the coastal State and the fishing States in that sector shall also cooperate to adopt conservation measures towards those populations in the adjacent sector.

For the highly migratory fishes, the coastal State cooperates with the fishing States in the area to promote the optimal use of such species within the entire region, both inside and beyond the exclusive economic zone, pursuant to article 64. In that case, the coastal State does not set in a unilateral way the conservation regulation for the area adjacent to its exclusive economic zone. That point was the beginning of an important controversy over the special interests of coastal States.

6 CREEPING JURISDICTION

The main objective of the creation of the exclusive economic zone was to get to substantial balance in what regards the rights of coastal States and the rights of the other States. However, that balance was challenged by the trend of coastal States to adopt a national regulation that extended its jurisdiction or limited the freedoms recognized by the exclusive economic zone regime. That phenomenon is being called the *creeping jurisdiction*. (BECKMAN; DAVENPORT, 2012, p. 16)

During the 3rd Conference of the United Nations on the Law of the Sea, the negotiations resulted in finding out that there was an interest of coastal States on straddling fish on the high seas, which is subordinated to the principle of freedom. A significant part of the fish captured on the high seas is in an exclusive economic zone some time during their life cycle. Article 87 of the Montego Bay Convention sets forth that freedom of fishing on the high seas is not absolute: “Freedom of the high seas is exercised according to the provisions in the Convention and other International Law standards.” Those conditions refer to the conservation and management of the biological resources in the high seas, especially the submittal of fishing to the rights of coastal States. (LE HARDY, 2002, p. 146)

The Conference of the United Nations on Environment and Development that took place in Rio de Janeiro in 1992 recognized that the fishing State shall make the special interest of the coastal State over the fish stocks in the adjacent area effective as fishing on the high seas shall not cause significant damages to the coastal State’s sovereign rights of taking advantage of the natural resources in its exclusive economic zone. (BEURIER, 2014)

In the face of international standards that failed to result in a successful interpretation that would be able to provide coastal States with efficient means to fight high seas straddling fish stocks overfishing, those States have revived the creeping jurisdiction movement regarding the high seas. (HARDY, 2002)

By means of unilateral acts⁶, some coastal States vindicate an area where fisheries are regulated in regards of species necessary for the survival of stocks in their exclusive economic zone. That unilateral action is, to a certain extent, based on competences in terms of the conservation of own resources in part V of the Montego Bay Convention. After the failure of the preservation through the cooperation foreseen in article 63, § 2, coastal States decided to guarantee it in a unilateral way. *A priori*, the internal regulation on the management of high seas resources is illegal due to the principle of freedom on the high seas. Coastal States defend the possibility of unilaterally establishing conservation rules regarding common species or the ones associated to their exclusive economic zones thanks to their legal and scientific specificity in relation to straddling fish

⁶ That is, for example, the case of the Argentine law dated August 18, 1991 on fishing and the Chilean law dated September 6, 1991 that changes the general fishing law.

stocks. It is an area where fishing on the high seas is regulated or a control zone on the high seas set forth by the coastal State.

7 STRADDLING AND HIGHLY MIGRATORY STOCKS FISHING

To find a solution for the deadlock of competences for the conservation of straddling fish stocks, the United Nations organized a conference on the legal regime for the exploration of straddling and highly migratory stocks. The negotiations resulted in an agreement that was concluded on August 4, 1995 in New York at the level of international cooperation for the application of the specific provisions in the Montego Bay Convention. The 1995 agreement represents an attempt to maintain the balance between the principle of freedom on the high seas and the recognition of the coastal states' preferential rights and it recalls, as a condition for that balance, the obligation of cooperation so as not to exceed the acceptable volume of captures.

The coastal State can adopt any necessary measure to insure compliance with its internal laws in areas under its jurisdiction. According to article 7, § 2 of the New York Agreement, in order to adopt suitable conservation and management measures in the portion of the high sea that is adjacent to the exclusive economic zones, fishing States shall consider the conservation measures adopted by the coastal States regarding their exclusive economic zone. Conservation measures adopted within the negotiation between the coastal State and the fishing State on the high seas shall consider the ones already taken for the management of resources in the adjacent economic zone, which means that fishing States endorse standards that were unilaterally adopted. According to articles 63 and 64 of the Montego Bay Convention regarding straddling and highly migratory fish stocks, those States shall make an effort to reach an agreement, directly or by means of international fishing organizations. While waiting for an agreement over conservation measures according to the principle of cooperation, interested States shall take all possible measures to materialize temporary international arrangements.

On the high seas, the flag State shall apply all the necessary measures for the conservation of resources by its fishing vessels. The flag State is forced to impose respect to management standards directly

established by the States or within the competent international fishing organization on its fishermen. For fishing on the high seas to be legal, flag States shall previously issue fishing permits, which makes those States internationally responsible for their citizens. On the other hand, the coastal State may, at any time, request from the flag State to conduct an inquiry in case it may think a vessel bearing another flag is involved in non-authorized fishing.

Being a member of an international fishing organization allows a State to carry out the controls requested by the commission to any vessel belonging to another member State. Within an area on the high seas covered by an international fishing organization, any member State can use the organization's inspectors to confiscate and inspect the fishing vessels flying the flag of another member State. The power to impose penalties remains under the competence of the flag State, but the coastal State has some police power competences over fishing vessels. (MOMTAZ, 1995)

Pursuant to article 17 of the New York Agreement, a State that is not a member of an international fishing organization, that is not part in any arrangement for fishing management and that refuses to apply the measures established by such organization or arrangement, is not released from the obligation to cooperate for the conservation and management of straddling and highly migratory fish stocks. That State shall not authorize the vessels flying its flag to fish straddling and highly migratory fish stocks subject to the conservation and management measures created by such organization or arrangement. That ruling provision tends to move fishermen away from non-member States.

8. Illegal Fisheries

In recent years, the intensification of illegal fisheries of straddling and highly migratory fish stocks on the high seas and exclusive economic zones has contributed for overfishing. That issue was inserted into the negotiation agenda of the Committee of Fisheries of the Food and Agriculture Organization of the United Nations that developed the International Action Plan to fight against illegal fishery in 2002. That instrument reinforces the responsibility of the flag State in what concerns the conservation of biological resources on the high seas, recalling the

obligation of a substantial link between the fishing vessel and the State where it is registered. All the above favors the effective control that is essential for the accomplishment of the environmental objectives.

The 2002 International Action Plan recognizes the importance of the role played by the port State in regards to fishing on the high seas. That State is called to exercise investigation competences in what respects fisheries already held and thus to contribute for the fight against illegal fishery (that is, fishing held by vessels in maritime zones under the jurisdiction of a Coastal State with no previous authorization, or in case internal standards were violated). And the same thing takes place in case of non-declared clandestine or fraudulent fishing in the national jurisdiction area of a coastal State. Biopiracy can even be identified. (TOLEDO, 2012)

Fishing held by vessels flying the flag of a member State in an international fishing organization, but in violation of the conservation measures adopted by the last one, and non-declared clandestine or fraudulent fishing in an area of competence of an international fishing organization are also seen as illegal fishery.

Non-regulated fishing is the illegal fishery on a maritime space under the competence of an international fishing organization by vessels without a nationality or flying a flag of a State that is not part of an international fishing organization, and the one held in areas not encompassed by conservation measures.

In 2005, similarly to the 2002 International Action Plan, the Food and Agriculture Organization of the United Nations wrote a document listing the measures that the port State should take in order to avoid illegal fishery held by fishing vessels momentarily located on their inland water. An agreement on illegal fishery was signed in Rome in 2009 to reinforce fishing control competences on the high seas by the port State and the flag State. The fishing vessel must request authorization from the port State to dock, providing information on captures and capture techniques implemented. That new agreement extends the field of competence of the port State, which then becomes the controller of the application of international fishing standards. (BEURIER, 2014)

9 ROLE OF THE PORT STATE

Fishing control competences by the port State had not been created by the legal instruments issued by the Food and Agriculture Organization of the United Nations. A long time before that, Montego Bay Convention had recognized its particular competences, although that State is not directly related to the pollution caused by waste. The port State is defined as the one of the port at which a foreign vessel is voluntarily docked for any kind of trade or technical operation. Pursuant to article 218 of the Convention, if a vessel unloads waste within maritime spaces under national jurisdiction or on the high seas, when it is voluntarily at a port or offshore terminal facility, the port State can start an inquiry and then a lawsuit for violating international standards applicable through the relevant international organization or a general diplomatic conference, even when there are no damages or serious risks to the quality of the environment. The Port State starts a lawsuit regarding a violation committed under the jurisdiction of another State in case it, the flag State or another State that suffered or could have suffered damages due to that waste, under the demand of the other State. The port State transmits to the interested State the information collected during the investigation, which does not prevent the lawsuit to unfurl to the end at the port State. It is the most extensive competence in Montego Bay Convention.

The exercise of exorbitant competences by the port State is linked to several guarantees such as “the suspension of lawsuits in favor of the flag State, the limitation of the police power to respect navigation safety, the notification of measures taken in the flag State and the request for immediate release of the confiscated asset in case of deposit.”⁷ (BEURIER, 2014, p. 1.641, *our translation*)

10 MARINE GENETIC RESOURCES

The concept of marine genetic resource comes from the assessment of fishing regulations. As already seen, the international fishing law relates the existence of stocks to the fishing effort made by men in order to meet

⁷ “[...] la suspension des poursuites au profit de l’État du pavillon, la limitation de l’exercice du pouvoir de police afin de respecter la sécurité de la navigation, la notification de mesures prises à l’État du pavillon et la demande de la prompt mainlevée de l’immobilisation en cas de paiement d’une caution.”

his needs and wishes. Fish stock is a group of individuals, always seen as a cohesive group by the States e international fishing organizations. The fishing effort designates, in turn, the group of means to capture those stocks. The idea of genetic resource is comparable to the genetic diversity and, consequently, to biodiversity. The stock can be partly determined by a genetic unit. Then, it is possible to say that there is no difference between biological resources and genetic resources in the Law of the Sea. (NOIVILLE, 1997, p. 155)

The progress of biotechnology has allowed for the use of genetic marine resources to produce medicine, cosmetics and new industrial practices thanks to the discovery of promising genetic properties in several ecosystems in the oceans. The biological diversity found in the marine environment as a consequence of the development of biotechnology has strategic economic importance. The biological resources are not just subject to quantitative count, but also qualitative. Genetic resource prospection expeditions at sea are more and more numerous. It is a way to use elements that are intrinsic to the fauna and flora species that had been unknown by then. Differently from fishing, the use de genetic resources does not try to take possession of a large number of specimens of the same species, but it tries to discover a potentially profitable singularity for the bio-industry. (TOLEDO, 2012)

In maritime spaces under the sovereignty and jurisdiction of the coastal State, that is, on inland waters, territorial sea and exclusive economic zone, Montego Bay Convention states that such State is competent to manage marine scientific research and use regarding all natural resources. The access to genetic resources and bio-prospection activities is not free. To the contrary, the legality of those activities is conditioned to the issue of a previous authorization by the coastal State, which shall require compliance with its internal laws on the subject.

The Law of the Sea considers the obligation of the States to manage their biological resources according to the principle of sustainable development. The national authority for the management of the genetic heritage and the explorer shall, in addition to that, respect the regime deriving from the Convention on Biological Diversity. According to article 15, § 1 of that convention, the State holds sovereign rights over its biological resources and the competence to provide access to genetic resources belongs

to the government and is ruled by internal laws. The State approval assumes an access agreement where sustainable use, *in situ* conservation, equitable distribution of benefits, especially through biotechnology transfer, as well as scientific cooperation based on information exchange and researchers qualification are forecasted.

The legal regime of the genetic resources on the high seas and the large sea floors is totally different. If the biological resources are located on the continental shelf beyond the 200 miles up to its external limits, the coastal State has the exclusive right to exploration and use. Article 77 of Montego Bay Convention foresees that: “The coastal State has sovereign rights over the continental shelf for the purposes of exploring and using its natural resources.” If the genetic resources are located beyond the continental shelf or if the species move freely through the water column, the high sea biological resources regime shall be applied, knowing that they are not in constant physical contact with the ground. The high seas are not encompassed by any sovereignty. Thus, we are talking about the *res nullius* regime based on the free use of the genetic resources, which prevails on the high seas. (TOLEDO, 2015a)

Sea floors and their underground beyond the limits of the international jurisdiction – or simply the Area – are internationalized marine spaces ruled by part XI of the Montego Bay Convention. Article 133 of that instrument announces that the resources of the Area are all solid, liquid or gaseous mineral resources. Those mineral resources and the Area itself are part of the common heritage of mankind or *res communis* pursuant to article 136. Once the convention expressly forecasts that the regime of the Area only applies to mineral resources, one may conclude that the biological resources are excluded from the common heritage of mankind. The genetic resources on or in the ground or underground beyond the exterior limit of the continental shelf cannot be considered as resources belonging to the Area. Under those conditions, those resources are freely accessible because they are managed according to the high seas regime.

On December 8, 2015, the General Assembly of the United Nations adopted Resolution 70/75, on the feasibility of fisheries, by consensus. It takes the needs of developing countries to reach objective 14 of the Sustainable Development Program on the 2030 horizon into consideration. Through that Resolution, the United Nations has strived to

adopt a new legally binding instrument for the conservation of the marine biological diversity outside the national jurisdiction. (ONU, 2015)

11 PROTECTION OF THREATENED SPECIES

The organization and framing of fishery also lie on the definition of the fishing season, as well as the identification of the areas open to citizens in fishing States. Those measures can be complemented by rules based on other factors such as the maturity of individuals in the fish stock according to size or weight. On that subject, the use a specific technology is regularly forbidden. (BEER-GABEL; LESTANG, 2003)

The first fishery technology is the net. Fishing marine fish stocks in the water column at a depth closer to the surface is traditionally employed by large size oceanic seiners that catch the resources when they are on the surface. In the 1980's, the coastal Pacific States developed the drifting gillnets⁸: the net is placed vertically on the water column with the help of buoys on the top and leaded on the base. That net extends up to 60 kilometers long and a 50-meter drop and it allows for passive fishing where the fishes are captured when they swim into the net and their gills get entangled in the mesh. Several international fishing organizations such as, for example, the Inter-American Tropical Tuna Commission, have concentrated their attention on the significant damages of non-selective fishing artifacts. The South Pacific Forum expressed its concern about the impact of those *murder nets* in 1989 when adopting the Wellington Convention on the ban to fish with large size drifting gillnets.

The use of that predatory fishing technique has resulted in the accessory capture of a large number of birds, marine mammals and turtles. Twenty million tons of those accessory captures are annually discarded into the sea. That corresponds to about 25% of the total fish production in the world. (BEER-GABEL; LESTANG, 2003, p. 87)

The drifting gillnets are not the only ones to capture non-targeted species. Tropical shrimp fishing through trawling results in considerable mortality of other animals. Rejected captures go way beyond shrimp captures. Longline fishing is also responsible for catching a large number of turtles. An evaluation of the amount of accidental captures of non-targeted

⁸ The drifting gillnet is maintained on the surface or below it by means of buoys that drift together with maritime currents, free or attached to the fishing vessel.

species, considering the impact of the use of trawling nets, maintained the longline technique in the category of predatory fishing mechanism. (TOLEDO, 2015b, p. 333) In addition to that, predatory fishing methods such as dynamite or poisoning are still used. The environmental damages caused by all those fishing techniques are an alarming reality.

Before the tragedy of accessory captures, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) banned longline fishing that was causing the death of thousands of albatrosses and marine birds. That situation warned member States of the 1979 Bonn Convention of the protection of migratory species and the 1992 Convention on the Conservation of the Southern Bluefin Tuna. Those States, based on the Action Plan adopted in 1999 by the Food and Agriculture Organization of the United Nations aiming at reducing the accidental capture of sea birds in longline fishing, signed the Canberra Agreement in 2001 on the conservation of albatrosses and e petrels. Due to the high levels of mortality from accidental capture in longline fishing, the States formalized an agreement of the same model of the one existing for turtles. (TOLEDO, 2015b)

In what concerns the turtles, in the face of the threat of extinction caused by pollution, accessory captures and excessive use, certain States have been reacting considering their international obligations, especially the ones of the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Montego Bay Convention, to protect wild species such as turtles. In 1996, the Inter-American Convention for the Protection and Conservation of Sea Turtles was signed in Caracas by the States in Latin America, the United States and the Netherlands.

The field of application of that convention on sea turtles encompasses the parties' terrestrial territory, the sea territory, the spaces under the jurisdiction of the coastal State and even the high seas regarding the vessels that fly the flag of member States. Those shall include into their internal order the means to implement the conventional provisions and to monitor the implementation. Those conventional provisions include the ban to intentional capture, detention or death of sea turtles, their parts, products and eggs, as well as its trade. They also determine that the States adopted measures to reduce accessory captures to a minimum when carrying out fishing activities. (BEURIER, 2014)

Article 65 of the Montego Bay Convention determines that no provision in the part on the exclusive economic zone restricts the right of a coastal State to forbid, limit or regulate the use of sea mammals in a stricter way than the one forecasted in this part, neither the eventual competence of an international organization to do it. The States shall cooperate in order to insure the protection of sea mammals by means of the international organizations qualified to manage the cetaceans.

The International Whaling Commission was created in 1946 by the Washington Convention to provide the whaling industry with the means to develop even more. However, the excessive use of the biological resource led to a collapse of the whale stocks, which led the commission into adopting protection measures. It may then define, for example, resolutions on the management of particularly threatened stocks, the hunting technology, the issue of capture permits on scientific purposes and the implementation of moratoria (hunting bans set for a one-year period renewable aiming at very specific species with no spatial limitations). The International Whaling Commission can also establish other bans in spaces called sanctuaries, a well-defined geographic area where it is forbidden to hunt all whale species.

As the whales, the dolphins are sea mammals that follow the tuna stocks and whose proximity helps fishing vessels to find fish, which is known as dolphin fishing. The use of nylon nets and the use of the purse seine fishing technique⁹ caused the increase of tuna captures and, consequently, the accessory capture of dolphins. Confronted with that serious problem, the Inter American Tropical Tuna Commission decided to take protection measures in favor of the dolphins. Later in 1992, the Commission adopted a multilateral program in La Jolla to reduce the mortality of dolphins in eastern Pacific.

12 PROTECTED SEA AREAS

In the terrestrial spaces, there are protected areas whose legal regime aims at protecting nature. In the ocean, there were only the delimited sea zones by the 1960's, where the captures were totally or partially forbidden during the entire year or per season. In the 1980's, Montego Bay

⁹ The purse seine net has a cable on its lower part that is pulled to enclose the school of fish, working as a purse that retains the fish.

Convention forecasted in article 211, § 6, the possibility that the sovereign State imposed specific control measures for navigation in sensitive areas in their exclusive economic zone to prevent pollution by vessels, since the decision is scientifically justified and consentment is obtained from the assembly of the International Maritime Organization. The coastal State can then take all the necessary measures to protect the specific habitats in the sovereignty zones.

The Montego Bay Convention fails to specifically approach the protection of high seas' spaces. Pursuant to article 87, all the States are free to dedicate to navigation, fishing and scientific research on the high seas. Once that freedom is not unlimited in what concerns biological resources, the States shall take all the necessary measures applicable to their citizens to guarantee conservation on the high seas. On that purpose, they have to consider not only the biological resources themselves, but also the associated species, knowing that all the States are forced to conserve economically targeted stocks, as well as associated or dependent species. That convention never expressly mentions habitats.

From the 1990's, it is not possible to talk about protection of species without referring to the conservation of the environment where they live. That is how protection of sea spaces became one of the keys of biodiversity conservation. That new approach defines the ecosystem importance to protect sea and terrestrial habitats. The concept of marine area has been developed as a maritime zone clearly defined, specialized and ruled by legal means or other more efficient means to guarantee long term conservation of nature, ecosystems and associated cultural values.

The creation of protected marine areas starts to be shaped in 1995 with the adoption of the Protocol related to the especially protected areas and to the biological diversity in the Mediterranean. From that legal base, particularly important areas are defined in the ocean for the conservation of biological diversity, where a very strict legal regime is established. The ban of some activities, the passage limitation, the measure application controls are common characteristics of the regimes of the areas that are particularly interesting for ecology. The creation of those protection areas becomes more complex when the geographic space to be protected is beyond the limits of national jurisdictions.

The 18 regional conventions for the protection of the seas

were signed under the auspices of the United Nations Program for the Environment as of 1974 to create a specific legal as each sea corresponds to a unique means and particular environmental issues. The regional conventions for the protection of the seas and their action plans are the main legal instruments for the implementation of the objectives of the Millennium for development and the Plan of Implementation of the World Summit on Sustainable Development that took place in Johannesburg in 2002. (LEFEBVRE, 2010) However, those regional conventions accurately respond to the challenges of a maritime area that interests some States. Each one of the regional conventions of the seas developed different strategies related to the specially protected areas within its zones of competence, with the adoption of conservation measures regarding rare or delicate ecosystems, as well as the habitats of threatened species.

Although regional measures regarding protected marine areas may only bind member States, it is difficult for the other States to oppose its regulation because it is not discriminatory and it is defined based on complex scientific studies. The International Maritime Organization itself, via the 2001 Resolution A927(22), recognized the possibility to create a special navigation regime for particularly sensitive marine zones to protect them, according to article 211 of the Montego Bay Convention. That Resolution is very important for the general respect of protected regional marine areas on the high seas. However, in what concerns the respect for measures on the high seas by a non-member State, there are contradictions between the freedom of the high sea and regional environment agreements. Ultimately, the oceans are fragile means that the States shall protect. Thus, they shall seriously think about a more and more global governance of the oceans. (COUTANSAIS, 2015)

CONCLUSION

The ocean has a very important intrinsic value. Marine fauna and flora are fundamental elements for the ecological balance of the planet and routine human needs. It is, then, also very important to guarantee the sustainable management of marine biological resources to meet the needs of the present and future generations, which is the basis of sustainability.

Scientific researches have shown the existence of important

biodiversity on the large sea floors. Those studies have allowed discovering biological resources in hydrothermal sources, in forms not yet known that do not depend on photosynthesis. Biological wealth in the seas is far from being totally known and there is still a lot to be discovered.

Montego Bay Convention consecrates part XII of its provisions to the protection and preservation of the marine environment. The States have the obligation to protect and preserve the marine environment. That same instrument says that the States have the sovereign right to explore their biological resources according to their environmental policy and according to their obligation to protect and preserve the marine environment. The exercise of sovereignty over biological resources cannot mean the violation of the rights or interests of other States. Thus, the States that exercise their sovereignty are responsible for the significant damages caused to other States because of incidents or activities resulting from their jurisdiction or control. For that reason, they shall internally regulate the exploration and use activities regarding those resources that take place in their sovereignty and jurisdiction spaces.

Considering the risk of significant transborder environmental damages, the States shall cooperate, directly or by means of global, regional and sub-regional organizations, to prevent, reduce and control the destruction of the marine environment and insure international responsibility. International cooperation for environmental protection shall forecast technology transfers in favor of developing States so that they can also act thoroughly in their jurisdiction areas to solve environmental dilemmas regarding the biological resources.

Those dilemmas are basically the fight against the introduction of invading exotic species to the detriment of the maintenance of the food chain, illegal fishery, marine bio-piracy, overfishing on the high seas, non-regulated fishing of straddling and highly migratory stocks, the excessive use of genetic resources beyond national jurisdiction, the inconsistencies of legal regimes in the protected marine area.

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