

GrEAT

Green Education for Active Talents

INTELLECTUAL OUTPUT 2 TRAINING MODULES AND MATERIALS

Nature conservation



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CHAPTER 1: TOPIC FRAME

Introduction

The conservation of nature is defined by all the human actions directed towards maintaining the integrity and balance of the ecosystems and biodiversity. This concept acts on preventing or correcting the damages the ecosystems suffer due to human activities.

Those actions may only be enabled after a general awareness is raised about the ecological impact of human activities. It then translates into both individual and collective actions in many human activity fields that have an impact on nature, such as:

- Agriculture;
- Forests exploitation;
- Farming;
- Hunting and fishing;
- The extraction of natural resources (hydrocarbon, ore mining);
- Infrastructures (roads, dams, cities, etc.);
- Water and waste management etc.

In each of these fields, conservation programs strive to limit the negative impacts on nature or to correct them. The concept of nature conservation is built on a reasoned management of resources whereas the preservation concept works towards the protection of sensitive natural ecosystems against any human damage.

Biodiversity

Europe has a stunning diversity of plants, animals and habitats. Few places on the planet have such a contrasting patchwork of habitats, wildlife and cultural landscapes in such a small area.

We need this wildlife to survive. Insects pollinate our crops, for example – a service worth €22 billion to European agriculture every year.

But human activities are putting enormous strain on the environment and driving some species to extinction. The main threats are the disappearance of natural habitats, over-exploitation, non-native species, climate change and pollution.

Today, almost half of Europe's mammals and a third of reptile, fish and bird species are endangered. This is mainly because their habitats are shrinking as urban areas grow and we take more land for infrastructure like roads.

Half of Europe's wetlands have now been drained, and almost three-quarters of the dunes in France, Italy and Spain have disappeared.

Most valuable habitats for wildlife are protected by law, but many protected habitats are in a poor state and need to be restored.

Some wildlife species are endangered because of overexploitation – a particular problem in the seas, where overfishing has caused some fish stocks to collapse.

Natural Resources

We need natural resources like metals, minerals, forests, land, food, air and water for our prosperity and well-being, but we are using them up faster than they can be replaced. When we destroy animals and plants that keep our ecosystems in balance, we are storing up problems for the future. What can we do about it?

By 2050, if we follow our current path, we would be extracting five times more resources than we do today. That probably won't be possible. More than 60% of our ecosystems are already over-exploited, world fish stocks face grave threats, and we are endangering the quality of our water and air by cutting down too many trees.

As the world population heads towards 9 billion, we need to become a society that uses resources more efficiently – one that works to improve the environment rather than damaging it.

We need to reduce the environmental impacts of production and consumption at every stage – from the extraction of raw materials to the use of the products they become and the waste they create when disposed of. The best way to do that is to improve the design of products and encourage manufacturing processes that use materials less wastefully.

When we reduce the amount of materials we use, and re-use and recycle, we recover valuable materials and help reduce emissions. Recycling aluminium saves around 95% of energy compared to extraction, for example. Likewise, reducing the amount of waste going to landfill reduces emissions of methane, a powerful greenhouse gas.

We also need better information about what we are doing. GDP measures monetary values, but it doesn't measure things that aren't traded, like a clean environment. Additional indicators – which the Commission is trying to develop – would help us measure environmental, social and well-being issues better. This would help us understand the sort of changes we will need to be more resource-efficient.

Soils

And **soils** are home to numerous species, from minute microbes and insects to larger creatures like moles and rabbits.

It takes thousands of years to produce the few centimetres of soil beneath our feet. This means that it is practically non-renewable.

Mankind depends on soil for life, but human activities are taking their toll. Some farming practices make soils vulnerable to erosion. Large areas of very fertile soil are being covered by concrete or asphalt as cities continue to grow. In some regions irrigation has made the soil salty and less fertile.

In some places, industrial processes have contaminated soil with substances such as lead, oil and solvents. This pollutes groundwater, damages human health and harms organisms in the soil. Food quality is affected because crops grown in polluted soils absorb the contaminants, endangering the health of consumers.

The changes in temperature and rainfall that climate change is expected to bring about will make soils increasingly more vulnerable.

Seas

Overfishing means that almost half of European stocks are now below safe limits, and if we continue fishing like this, fish stocks around the world could collapse by 2050.

Fishing removes not just target species but also other creatures caught in nets (by-catch). Some fishing methods threaten other wildlife such as dolphins, turtles and birds, which become entangled in nets and lines

Bottom trawling can cause extensive damage to the sea bed, significantly changing the structure of the animal communities that live there.

If we want our fishing industry to become sustainable, we will need to assess stocks thoroughly and manage them more effectively.

Human activities have introduced a wide range of contaminants and nutrients into the environment.

Contaminants like mercury can enter the food chain and be found in the fish and seafood we eat, with obvious dangers to health. Nutrients like nitrates can lead to rapid algae growth. When the algae decompose, this uses up the oxygen in the water, leading many species to die.

Marine litter or “plastic soup” is a threat to wildlife as seabirds can mistake fragments for food. It can also trap sea creatures, e.g. turtles get ensnared in lost fishing gear.

Non-indigenous species are species which are not native to a region but have either got there accidentally (from ballast water in ships, for example) or have been introduced deliberately. Some then multiply and become ‘invasive’, out-competing native species.

One example is the comb jellyfish *Mnemiopsis leidyi*. This carnivorous animal was introduced into the Black Sea in 1982 and has proliferated enormously. It feeds on zooplankton and fish larvae and is a top predator at the end of the food chain.

As Europe's climate warms it will become easier for tropical species to survive here, bringing new threats to Europe's seas.

Forests

Forests protect us against climate change, removing CO₂ from the atmosphere and storing it in trees, vegetation and soil.

Over 40 % (1.77 million square kilometres) of the EU's land area is forested. Unlike many other parts of the world, forest cover in the EU is increasing – by 0.4 % per year. Forest habitats make up almost 20 % (over 14 million hectares) of the Natura 2000 network.

European forests are facing the challenge of climate change, so they need to be managed properly.

Most forestry laws are specific to Member States. But the EU is an active participant in international negotiations concerning forests around the world.

Some 60 million people rely directly on forests for their livelihood across the globe, and a further 1.7 billion depend on them indirectly for forest-based activities. And many of us need them for recreation – or artistic and spiritual inspiration.

Deforestation and forest degradation in developing countries accounts for around one sixth of global CO₂ emissions.

13 million hectares of forest (an area the size of Greece) are destroyed every year somewhere in the world, mostly to make way for farms, mines and new infrastructure. Much of this logging is illegal, flouting local laws.

This seriously affects local people and threatens valuable species. It also contributes to the global problem of climate change as converting forests to other uses can cause substantial greenhouse gas emissions as a result of fires and decay of vegetation, so that forests become a source of CO₂.

The EU is calling for global deforestation to be halved by 2020 and halted by 2030. It is proposing that ways to reward developing countries that act to stop deforestation should be agreed internationally.

The EU is also working with a number of timber-exporting countries to improve forest governance and ensure that timber imported from those countries is legally harvested. As of March 2013, no illegally harvested timber may be sold in the EU.

Invasive alien species are plants, animals, fungi and micro-organisms that become established in areas outside their natural range. Zebra mussels, for example, reduce water quality in lakes and clog up water systems. Not all these invaders are harmful, but some spread rapidly and out-compete native species. Their economic effect is huge: they cost €12.5 billion a year, and the problem is growing all the time.

Climate change will have big effects in Europe. Some species will adapt and move, but others will struggle to survive. If the temperature rises by between 1.5°C and 2.5°C, up to 30 % of plant and animal species may go extinct.

Water quality has improved over the last 20 years thanks to EU legislation, and we are now much better at treating sewage and industrial waste. But we still pollute our groundwater with too much fertiliser. The result is eutrophication – too much nitrogen in our rivers, lakes and estuaries, causing the spread of algae.

What can we do for nature conservation?

Nature conservation and preservation can take many forms, for example:

- National and regional parks, natural and biosphere reservations, the wetlands (the Ramsar Convention), etc., that allow the protection of both wild and human-impacted ecosystems;
- The programs that protect and preserve the wild fauna and flora:
 - o The Washington Convention, or CITES on endangered species trade;
 - o The Bonn Convention that works towards the protection and conservation of migratory species;
 - o The European Union's LiFe Program that finances conservation and protection actions throughout the Member States of the EU;
 - o The European Development Fund dedicated to the countries of Africa, the Caribbean and the Pacific (ACP) that lead nature conservation-oriented actions;
 - o The dedicated programs of cooperation agencies such as the AFD, GIZ, USAID...
- The actions lead by the many NGOs that work on the field and enable various scaled projects, a thousand of which are part of the IUCN network (International Union for Conservation of Nature).



Historical picture

The notion of nature conservation itself was born in the 19th century but didn't emerge as a concept before the creation in 1948 of the International Union for Conservation of Nature (IUCN).

The phrase « sustainable development » appeared for the first time in 1980 in a IUCN report and in 1982, the World Charter for Nature was adopted by the United Nations. It embodied at the time a globally raised awareness of the challenges related to nature conservation and preservation.

In 2000, 193 Member States of the United Nations and many international organizations adopted the Millennial Development Goals (MDG) and agreed to reach them by 2015. The seventh goal describes the many actions that would allow the preservation of the environment, and thus contribute to ensure its durability.

In 2015, the UN launched the 17 Sustainable Development Goals as a follow-up to the MDG. They gather up 169 targets for which indicators were determined to evaluate the accomplished progresses.

If goals 14 (Sustainable oceans and seas management) and 15 (Preserving and restoring the terrestrial ecosystems) specifically target the nature conservation and preservation challenges, others significantly contribute to the same issue:

- Goal 2: « Zero Hunger » (sustainable agriculture);
- Goal 6: Sustainable management of water resources;
- Goal 7: Clean and durable energy;
- Goal 8: Durable economic growth;
- Goal 9: Sustainable industry and infrastructures;
- Goal 11: Sustainable cities and communities;
- Goal 12: Sustainable consumption and production;
- Goal 13: Combat climate change.

Plus, we firmly believe that Goal #4: Ensure inclusive and quality education for all and promote lifelong learning constitutes a major transformation leverage serving the purposes of nature conservation.



The necessity of raising a global consciousness regarding the urging issues

The quality of our environment is degrading in an unprecedented environmental crisis. It is an incontestable fact, as well as the human origin of this crisis.

The 2016 WWF Living Planet Report makes an alarming assessment of the number and variety of both animal and vegetal species; as well as the growing fragilization of natural ecosystems due to human activities. Those are the incontestable signs that nature, which we are a part of, is in great danger. In the end, if we do nothing, we will have to face the extinction of a growing number of species, which are indispensable to the balance and the very existence of the ecosystems. We will suffer the degradation and even the loss of the services provided by nature, that are essential to our well-being.

Today, the nature conservation actions are both institutional and contractual, both collective and individual. They answer to an international determination to curb and correct the deterioration of the ecosystems, product of intensifying human activities. Their success requires a general awareness of the issues at stakes and a deep behavioural modification in societies.

The importance of biodiversity

The Convention on biological diversity defines biodiversity as the variability of living organisms of all origins, including among others, the earth, marine and other aquatic ecosystems and the ecological complexes they are a part of. This definition involves the concepts of diversity within and between species, and the diversity of ecosystems themselves.

These three interdependent concepts of biodiversity – genetical or intraspecific, specific or interspecific and ecosystemic, condition the sustainability of the ecosystems and the living beings that populate them by allowing them to survive normally to the changes of their environment.

The first concept accounts for the genetical variability within species and allows them to adapt to the changes in their environment. It is one of the motors of evolution and the creation of new species. It is that very same variability that allows some individuals of a species to colonize new habitats.

The second concept, the interspecific diversity, refers the number of living species. We generally think of this concept when speaking of “biodiversity” because it is the simplest to apprehend. Its depletion translates into the accelerated loss of living species (extinction crisis), generally due to brutal or very large-scaled modifications in the environment. The extinction of the dinosaurs is certainly the most popular, even though the scale of the one we are living today could appear more serious given its direct impact on humans.

The third one, the ecosystemic diversity, assesses the diversity of the different ecosystems present on Earth. The ecosystems are constituted by:

- The living beings (including humans) that form the biocenosis
- The surrounding environment, the biotope, in which they live.

The concept of ecosystem explores the interactions between biotope and biocenosis, but also in-between species. The ecosystemic diversity is essential given that its depletion has a direct impact on interspecific diversity for the species that only live in certain habitats that suffer great disturbances. For example, many species living in coral reefs are in great danger because of the modification of water temperature due to global warming.

Resulting in 3.5 billion years of evolution, the richness of the ecosystems supplies humanity with essential services.

First and foremost, the balance of biodiversity generates vital primary resources such as fresh water, aliments, or wood, and ensures the diversity of genetical identities. Balanced ecosystems then have a regulating function, regarding temperatures, climatic conditions, the management of waste and water but also pollination, crucial for the reproduction of vegetal species. They guarantee a safe habitat for migrating

species, ensuring the viability of their genetical identity. Finally, the richness of ecosystems ensures humanity many immaterial advantages.

Anthropocene

Today, the depletion of biodiversity is a major source of preoccupation. We have entered a new era, the Anthropocene, and it is the first time for our planet that the major factor of environmental change is the action of humans.

OECD experts foresee that by 2050, the MSA (Mean Species Abundance) indicator will decrease by 10%. The ever-growing encroachment of human activities on the ecosystems but also air and water contamination and global warming resulting of those activities have dangerously weakened biodiversity. One third of soft water vegetal species have disappeared and this tendency will be more and more accurate if actions are not taken to stop the phenomenon. Humans will be victims of the depletion of species variety, especially the poor and indigenous populations that directly withdraw their lifestyle from the services rendered by their ecosystems.

The UN's 17 Sustainable development goals detail the many actions fields for which humans now have to commit in order to correct their impact and thus limit the effects of natural habitats depletion.

On both private and institutional levels, it is critical to respond to the dangers the planet and all living beings are facing. The protection of fragile ecosystems, the reestablishment of their balance and the termination of biodiversity depletion must become essential goals, implemented in our actions, in corporations and governments.

By 2050, if nothing is done in that matter, half of mature forests' surface is doomed to disappear. Demographic growth in some geographical areas like Africa induce the increase of the pressures on the environment to satisfy human needs. In the absence of a balanced approach, those pressures pose a tremendous risk on natural ecosystems.

The future of humanity therefore lies on its capacity to balance its development needs and the respect of nature; but public policies remain to this day insufficient. Despite the ambitions of COP21 with the signature of the Paris Agreement in 2015, and despite the Sustainable Development goals, the Governments and private actors' commitment remains too weak. The specialists' forecasts, including WWF in its 2016 Living Planet report, are pessimistic and demand that awareness is raised and behaviours are quickly shifted.

Nature Conservation in Spain

To protect its wetlands, Spain is part of the Ramsar Convention, and has 74 designated wetland spaces. It has also signed the protection agreement for Wild Birds within the framework of the European Wild Birds Directive, and various marine areas have also been classified as protected areas under the Mediterranean Action Plan agreement. Moreover, the protection programmes created by UNESCO under the World Heritage Convention have recognised four Spanish National Parks: Doñana, Garajonay (on the island of La Gomera), Teide (Tenerife) and Monte Perdido (in the Pyrenees). Furthermore, UNESCO's Man and the Biosphere programme includes 48 biosphere reserves in Spanish territory. Spain also takes an active role in defending the global environment and has signed numerous agreements and protocols for the worldwide protection of nature, including particularly agreements in the area of air pollution, protection of the ozone layer, waste and dangerous effluents, whale hunting, climate change, protection of endangered species and defence of tropical rainforests.

Spain is also home to numerous nature areas which have been accredited by the European Charter for Sustainable Tourism (ECST), as well as a series of destinations belonging to be EDEN network (European Destinations of Excellence). Both these initiatives are organised under the auspices of the European Commission.

Nature Conservation in Europe

The European Union is a unique political, legislative and economic system. It provides a framework for many spheres of intern and intra-national activity, but as the above introductory remark indicates, by providing this framework absolute consistency is not guaranteed. This is in some aspects valuable, because each Member State's localized political and environmental circumstances dictate that local solutions to local problems are required. However, where environmental conservation issues cross national boundaries, some degree of consistency is required.

The EC must therefore seek to strike a balance between ensuring this consistency and allowing local flexibility in meeting the wider European and even global objectives for environmental conservation. The EC operates in a series of ways, in co-operation with national government. Where the EC operates, the underlying tenet is laid down in The Treaty of Rome of 1957, which is the constitution of the EEC. Paragraph 4 of Article 130R states that 'the Community shall take action relating to the environment when the objectives can be attained at Community level rather than at the level of the individual Member States'. To this end, European environmental policy has been geared towards meeting three objectives, namely:

- Preservation, protection and improvement of the quality of the environment.
- Contributing towards protecting human health.
- Ensuring a prudent and rational utilisation of natural resources.

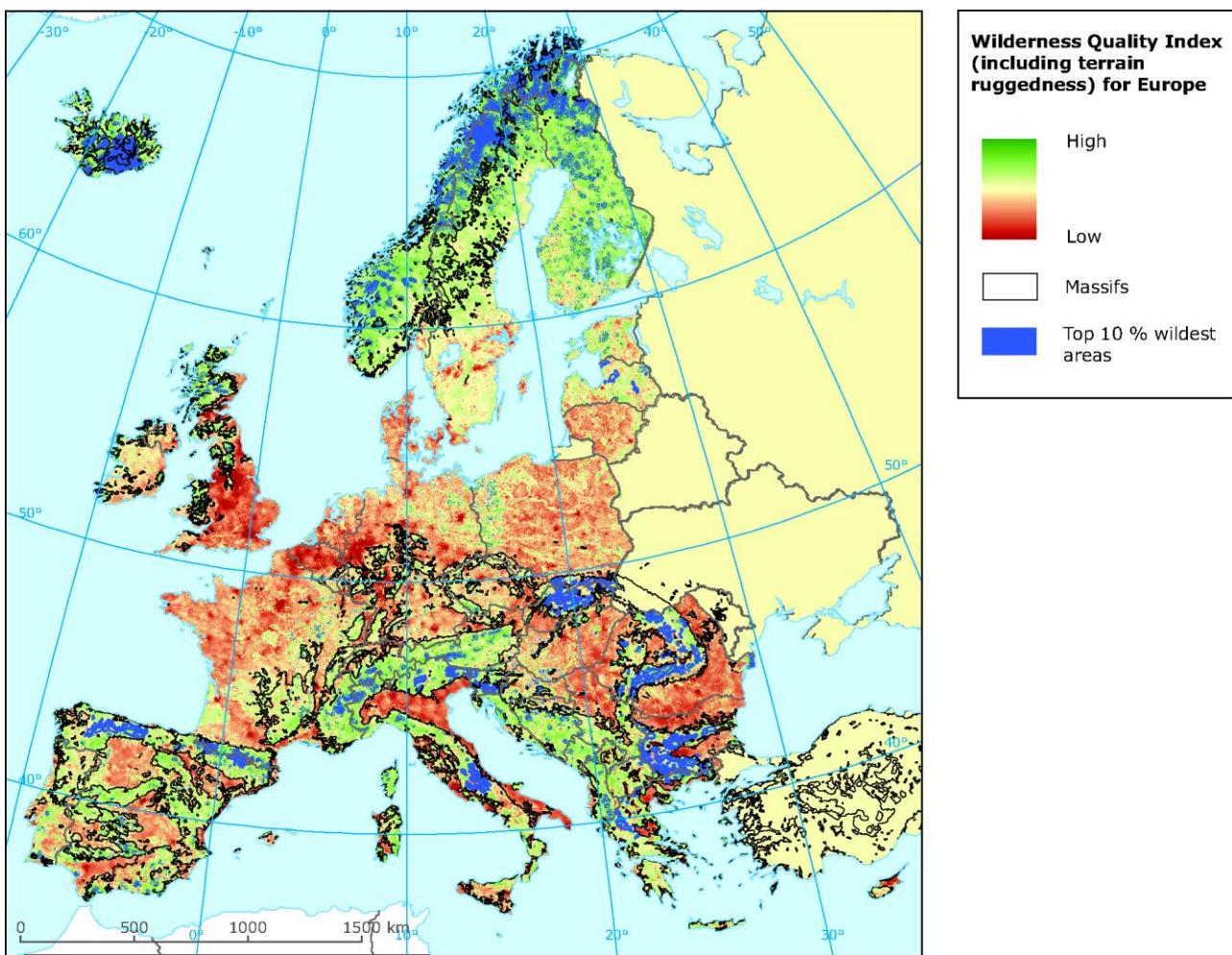
Harris (1989) identifies the environment as one element of the broader concerns of the EC. These broader concerns are not only identified within the Treaty of Rome, but also in the Single European Act of 1987 which represents a series of amendments and additions to the original Treaty. These two enactments identify many areas of interest for the EC, including monetary policy, economic and social cohesion, consumer protection, research and social policy.

In short, therefore, the European Environmental Policy is part of a much wider policy framework. Furthermore, the environmental policy itself is geared towards several broad objectives.

In the context here, it is the 'preservation, protection and improvements of the quality of the environment'

The concept of environmental protection, as we have seen, started in the United States of America with the first National Park in 1872. Forms of legislation began appearing within the individual countries of Europe from the early 1900s. In 1916, Spain enacted its first legislation concerned with protecting 'areas of national importance for their natural beauty', and before 1939, Italy designated four National Parks. In both cases, the Parks themselves were to be managed by regional authorities, in a similar way to the United States model. In 1949, Britain passed its 'National Parks' legislation.

The issue then appeared to recede in importance, until the 1970s when several other European countries turned their attentions to conservationist land designation. The conservation of natural resources was therefore a live issue at the outset of the European Community, and is an issue that kept recurring throughout the lifetime of the Community and its Member States.



CHAPTER 2: REFERENCE LAW

Principles and European legislation

The EU has been committed to the protection of nature since the adoption of the Birds Directive in April 1979. It provides comprehensive protection to all wild bird species naturally occurring in the Union.

The Habitats Directive was adopted in 1992 to help maintain biodiversity. It protects over 1000 animals and plant species and over 200 types of habitat. It also established the EU-wide Natura 2000 network of protected areas.

More recently, new legislation has been developed. In 1999, the EU reinforced the role of zoos in the conservation of biodiversity and, in the wake of the EU Biodiversity Strategy to 2020, committed to protect native biodiversity and ecosystem services against invasive alien species. We also have legislation regulating certain aspects of wildlife trade.

We also provide more information on the impact of the various enlargements on the Birds and Habitats Directives and about the current fitness check of the nature legislation.

Spanish legislation

Spanish environmental policy has its basis in article 45 of the Spanish Constitution, which sets out the right to enjoy an environment that is adequate for the development of people and the obligation to protect it. Following this constitutional dictate and the framework developed by the EU Directives, the Spanish Law 26/2007 on Environmental Liability sets prevention and “polluter pays” principles as the guidelines of environmental law in Spain.

The Spanish system foresees three levels of competences for bodies in charge of the enforcement of environmental law: national; regional; and local.

The National Administration (specifically, the Ministry of Agriculture, Fishing, Food and Environment) is entitled to enact basic legislation and to set the main coordination and supervision mechanisms. Autonomous Regions develop basic legislation in their territorial scope and approve environmental plans; they are usually the authorities who grant environmental permits and carry out most environmental procedures. Finally, municipalities have competences on certain sectors which have a special incidence on them such as noise or waste collection, and they usually grant the permits to start an activity in their territories.

Besides this three-level outline, there are other national and regional bodies and agencies which take part in the enforcement of environmental law within specific sectors, such as hydrographic confederations, the OECC (Climate Change Spanish Office), SEPRONA (Police in charge of the environment's protection), etc.

Italian legislation

10% of the Italian territory is included in protected areas and subject to specific nature conservation policies.

Italy is the European Country with the richest biodiversity: the main portion of natural habitat, important for the life of 56.000 animal species are inside protected areas. 98% of animal species are insects and other invertebrates; mammals count 118 species. The majority of the protected forests are: beech and oak forests, which play an important role in the resilience to climate change effects.

The national framework law regarding nature conservation is dated year 1991 and defines the different kinds of protected areas, that are listed hereby: National Parks, Regional and Interregional Parks, Natural Reserves, Wetlands of International Importance, marine protected areas.

Nature conservation policies is also implemented in the areas that belongs to the Natura 2000 European Network. Most of these areas are inside protected areas defined by the Italian Law.

The most representative protected areas are National Parks, which are 25 and cover around 15.000 squared kilometres, and Regional Parks, which are 134 and cover approximately 13.000 squared kilometres. The Italian Network of protected areas is also a means to contrast the phenomenon of soil consumption and to enhance the value of cultural landscape and the promotion of sustainable tourism and agriculture.

French legislation

In 2011, in keeping with the 2011-2020 Strategic Plan adopted by the Tenth Meeting of the Conference of the Parties to the CBD in Nagoya, Japan in October 2010, France scaled up its biodiversity action with a new National Biodiversity Strategy (NBS) for 2011-2020.

The commitment made by the first French Environmental Conference in 2012 "to make France a model biodiversity restoration country" can be seen at work in a biodiversity framework bill (bill for the restoration of biodiversity, nature and landscapes) currently being examined by the French Parliament. The purpose of this framework bill is to improve the balance between human activities and biodiversity in a contribution to the commitment made as a Party to the Convention on Biological Diversity "to live in harmony with nature." This bill also marks the country's move to apply the principles laid down by the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS Protocol).

Many actions have already been taken nationally to tackle biodiversity loss: designation of new marine and land-based protected areas; mapping of green and blue infrastructure; definition of action plans for endangered species; strategies to control invasive species; spread of biodiversity practices; information and knowledge-building campaigns; and regional and international cooperation actions. France reported on all its actions in its 5th National Report to the Convention on Biological (in French; 2014).

France is deeply committed at the highest level to rolling back poaching and illegal trade in wildlife. On 5 December 2013, France held a round table on combating the poaching and trafficking of endangered species. The round table, attended by nine African Heads of State alongside the French President, adopted a declaration and unveiled a French action plan. On 6 February 2014, France destroyed three tonnes of illegal ivory seized by customs in a symbolic gesture. The French action plan earmarks €25 million in grants for 2014 and 2015 to tackle poaching and trafficking in endangered species under its development aid policy.

Action to curb biodiversity loss and protect natural habitats and land and marine ecosystems has been part of French development and international solidarity policy since 2014 (Act No. 2014-773 of 7 July 2014 - in French).

In 2013, key French cooperation operator the French Development Agency (AFD) developed a 2013-2016 Biodiversity Cross-Sectoral Intervention Framework, focusing its action on three objectives:

- Sustainably protect, restore, manage and promote ecosystems;
- Integrate ecosystem conservation into development policies and all their sectoral dimensions (agriculture, energy, transport, mining and urban development);
- Strengthen partnerships between French stakeholders and developing countries for better global biodiversity governance. The AFD's Sectoral Innovation Facility for NGOs (FISONG) funds the promotion of NGO expertise and their capacity for innovation. A targeted call for biodiversity and development proposals was launched in French in 2012.

One of the missions of the French Global Environment Facility (FGEF) is to link up biodiversity with the other global environment concerns. For the past 20 years, the FGEF has been funding sustainable development projects with grants under multilateral environmental agreements (MEAs) ratified by France (see the FGEF's 2014 key figures and 2014 annual report). In 2015, the FGEF adopted its Strategic Programming Framework 2015-2018 targeting five focus areas and two cross-cutting goals: innovative biodiversity financing, integrated management and resilience of coastal and marine areas, sustainable agriculture and forests, sustainable cities, energy transition, sustainable production and consumption, and innovative processes.

France and the International Union for Conservation of Nature (IUCN) have developed a unique partnership since 2005, cooperating on biodiversity governance, the conservation of forests, savannas and arid zones in Sub-Saharan Africa, and the conservation of oceans and island environments, including overseas. France is also partner to the Critical Ecosystem Partnership Fund (CEPF), which helps civil society work on the conservation of endangered environments and bring local communities on board to protect the ecosystems on which they depend for their well-being.

The new Biodiversity Law adopted in July 2016 includes measures such as the creation of the French National Agency for Biodiversity (AFB). Moreover, the law invites French regions to develop a regional governance on biodiversity with a Regional Council on Biodiversity (which will give strategic impulse) and a Regional Biodiversity Agency (which will finance and implement the plans and measures. Both entities include all the players concerned by nature and are chaired by the State and the regional authorities. This governance scheme illustrates the fact that French regions are in the leading position to determine the priorities for nature conservation on their territory and on the green and blue network. This Law includes the principle of compensation of ecological damage, non-regression of environmental protection, and no net loss of biodiversity. It further consolidates into law the principle of applying the sequence 'avoid, reduce, compensate' ('éviter, réduire, compenser'), similar to the no-net-loss concept (European Commission, 2017); in the design and implementation of plans, programmes and projects (e.g. impact assessments, measures related to Natura 2000, protected species), the contracting authorities have to define appropriate measures to avoid, reduce or compensate negative impacts on the environment (Ministère de l'Environnement, de l'Énergie et de la Mer, 2017).

The National Strategy for Ecological Transition - Towards Sustainable Development (2015-2020) provides a policy framework for all national, public and private stakeholders in the field of sustainable development. The first priority identified by the strategy is to *“Protect and strengthen the capacity of territories to supply and to benefit from ecosystem services”*.

Croatian legislation

Pursuant to the Nature Protection Act there are 9 categories of protection in the Republic of Croatia. They are: strict reserve, national park, special reserve, nature park, regional park, nature monument, significant landscape, park forest and park architecture monument.

According to the Ministry of Environmental Protection and Energy (2018) „each national park and nature park is managed by a separate public institution established by the Government of the Republic of Croatia. The other protection categories are managed by public institutions established by the representative body of a regional self-government unit and founder's rights over the public institution may be transferred by the representative body of a regional self-government unit to the local self-government unit in the territory of which the protected area is located“.

Currently, there are 444 protected nature areas designated in various categories, covering a total area of 5124.80 km² (9.05% of total territory). The most of the protected territory are nature park or national park categories (State Institute for Nature Protection, 2006).

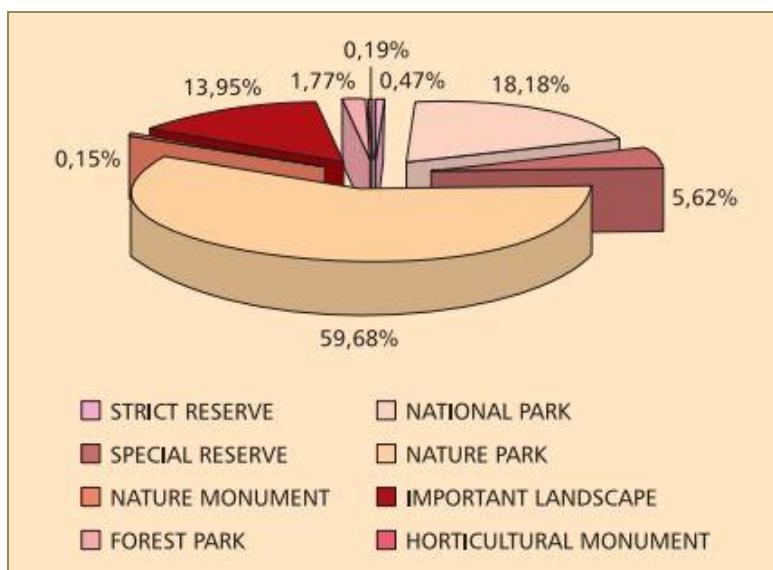


Figure 1. Categories of protected areas (State Institute for Nature Protection, 2006)

There are 2 strict reserves, 8 national parks and 11 nature parks already protected. Three of the eight national parks (Kornati, Brijuni and Mljet) are insular and characterised by rich marine life. The Northern Velebit, Risnjak and Paklenica National Parks are mountainous areas characterised by particular relief features with numerous limestone rocks and screes, high-mountain meadows and vast forest complexes.

Plitvice Lakes is the oldest and largest national park in the Republic Croatia. With its exceptional natural beauty, this area has always attracted nature lovers, and already on 8 April 1949, it was proclaimed Croatia's first national park (Plitvice Lakes National Park, 2018).

Six of ten Croatian nature parks cover mountain areas (Medvednica, Žumberak-Samoborsko gorje, Učka, Biokovo, Velebit and Papuk). The Kopački rit and Lonjsko polje Nature Parks are large flooded areas of the Pannonian lowland, and each includes a special ornithological reserve (State Institute for Nature Protection, 2006).

Croatia has signed the United Nations Convention on Biological Diversity (Rio de Janeiro, 1992) and one of the main goals of the Convention is preserving biodiversity. Biodiversity is, according to the aforementioned Convention, the totality of all living organisms that are constituent parts of land, sea and other aquatic ecosystems and ecological complexes; including diversity within species, between species, and diversity

between ecosystems. Croatia is considered as one of Europe's richest biodiversity countries (Croatian Agency for Environment and Nature, 2017).

The vast diversity of habitats has also resulted in a great wealth of wild species. The current number of wild species in Croatia is unfortunately still unknown. Until now, there are about 40,000 known species. However, the number of wild species assumed is much higher, with estimates ranging from 50,000 to more than 100,000. Every year, scientists find and describe new species and subspecies (Croatian Agency for Environment and Nature, 2017).

CHAPTER 3: POLICY INSTRUMENTS

The EU has strong **nature protection legislation**. It revolves around the Natura 2000 network – 26 000 protected sites that make up one fifth of the EU's land area. It is the largest such network in the world, and it offers vital protection for Europe's most endangered species and habitats.

The network has a major economic impact: one estimate of the benefits provided by the network puts the value between €200 and €300 billion per year, or 2 % to 3 % of the EU's Gross Domestic Product.

The seeds of Natura 2000 were sown in 1979 when the EU passed its first major piece of nature protection legislation, the Birds Directive. This protects all wild birds in the EU, covering some 500 species. EU countries identify and protect sites that are particularly important for wild birds. So far, around 5 300 'Special Protection Areas' have been created.

A second instrument, the 1992 Habitats Directive, obliges EU countries to protect the habitats of endangered species of plants, animals and habitats. Protected sites are known as 'Special Areas of Conservation'. The Habitats Directive covers some 1,500 rare and threatened plants and animals, and around 230 habitat types, including hay meadows, heathland and salt marshes.

The areas protected under these two Directives form the Natura 2000 network. Its aim is to safeguard all of Europe's major habitat types and endangered species.

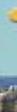
The Natura 2000 Network is now almost complete. Over 26,000 sites have been included so far, making it the largest coordinated network of protected areas in the world. Natura 2000 covers 18 % of EU land area and substantial parts of the surrounding seas.

Natura 2000

Europe's nature for you



Biogeographical regions of the European Union



The EU has seven biogeographical regions, each with its own characteristic blend of vegetation, climate and geology. Working at this level makes it easier to protect species and habitats within Natura 2000 sites under similar natural conditions, irrespective of political and administrative boundaries.



Natura 2000 is not just a network of protected nature reserves. It recognises that humans and nature work best in partnership. Its aim is not to exclude economic activities but ensure they are compatible with safeguarding valuable species and habitats.

The main objectives within Natura 2000 sites are:

- avoid activities that could seriously disturb the species or damage the habitats for which the site is designated
- take positive measures, if necessary, to maintain and restore these habitats and species to improve conservation.

This approach has many advantages: by encouraging sustainable forestry, fishing, agriculture and tourism, the network ensures a long-term future for the people who live in these areas and rely on these activities.

CHAPTER 4: THE JOB MARKET

If you are passionate about helping the planet or want to find a career where you are making a difference to the world, then environmental protection might be the perfect sector for you.

A core element of environmental protection is resource management. Resource management is not, as many people think, about managing the environment but actually about managing the way humans interact with the natural world in order to protect and preserve natural ecosystems. This may involve considering ethical, economic and ecological variables in order to limit environmental degradation.

Some of the biggest problems in environmental protection today are related to fossil fuels, which are related to pollution, climate change, and natural resource depletion. Combustion of fossil fuels releases a range of gases and toxins that are linked to global warming. Another environmental issue that has been very prominent in the news is water pollution by plastics, which has had a harmful impact on marine life and ecosystems.

What kind of careers are there in environmental protection?

Environmental science and protection is a field that encompasses a range of disciplines, meaning that it includes a range of careers that require different skill sets. Whereas environmental jobs once mainly consisted of scientific research roles, the rapidly growing ‘green jobs’ sector means that there is demand for passionate environmentalists in a number of fields, including law, marketing, planning and development, education and conservation. Some of the more traditional roles in environmental protection include environmental scientist, hydrologist, zoologist, and conservation scientist.

CHAPTER 5: PROFESSIONALS

Working together
across the EU to conserve
and manage large
carnivores



Wildlife Inspector and Forensics Specialist

Activity

description

Intercepts smuggled, illegal shipments of live wild animals for the pet trade and wild animal parts for trophy or medicinal purposes. Wildlife inspectors are stationed at international airports, ocean ports, and border crossings. Forensics specialists perform scientific and investigative work to document the origin and nature of evidence collected on these illegal imports.

Competences

Employers seek graduates who are calm, assertive and resilient, with excellent communication, teamworking and interpersonal skills. Candidates must be capable of acquiring and retaining detailed legal, technical and commercial information.

Reference job market and economical treatment

Salary average 48,200€ for all forensic science technicians

Course of study

Bachelor's degree; major in wildlife sciences and minor in forensics or similar combination may be beneficial

Networks

The wildllife society.

Summary

A wildlife inspector is a person empowered by law to protect wildlife.

A wildlife inspector is a government official who reviews shipments of live wild animals at international airports, sea ports, and border crossings. Wildlife inspectors also monitor shipments for products produced from wildlife such as trophies, furs, leather shoes and bags, jewelry, meat, feathers, coral, and shells.

To know more

<http://wildlife.org/>

Geologist

Activity description

A geologist is a scientist who studies the solid, liquid, and gaseous matter that constitutes the Earth and other terrestrial planets, as well as the processes that shape them. Geologists usually study geology, although backgrounds in physics, chemistry, biology, and other sciences are also useful. Field work is an important component of geology, although many subdisciplines incorporate laboratory work.

Geologists work in the energy and mining sectors searching for natural resources such as petroleum, natural gas, and precious metals. They are also in the forefront of preventing and mitigating damage from natural hazards and disasters such as earthquakes, volcanoes, tsunamis and landslides. Their studies are used to warn the general public of the occurrence of these events. Geologists are also important contributors to climate change discussions.

Competences

A geologist can work in different fields such as: economic geology, engineering geology, geophysics, geochemistry, geochronology, geomorphology, hydrogeology, igneous petrology, isotope geology, metamorphic petrology, marine geology, palaeoclimatology, palaeontology, pedology, petroleum geology, planetary geology, sedimentology, seismology, structural geology or volcanology.

The main skills of a geologist are:

- Using scientific rules and methods to solve problems.
- Using mathematics to solve problems.
- Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
- Communicating effectively in writing and orally as appropriate for the needs of the audience.
- Understanding the implications of new information for both current and future problem-solving and decision-making.
- Understanding written sentences and paragraphs in work related documents.
- Determining the kind of tools and equipment needed to do a job.
- Generating or adapting equipment and technology to serve user needs.
- Analyzing needs and product requirements to create a design.
- Considering the relative costs and benefits of potential actions to choose the most appropriate one.

Reference job market and economical treatment

Professional geologists work for a wide range of government agencies, private firms, and non-profit and academic institutions. They are usually hired on a contract basis or hold permanent positions within private firms or official agencies.

Local, state, and national governments hire geologists to work on geological projects that are of interest to the public community. The investigation of a country's natural resources is often a key role when working for government institutions; the work of the geologist in this field can be made publicly available to help the community make more informed decisions related to the exploitation of resources, management of the environment and the safety of critical infrastructure - all of which is expected to bring greater wellbeing to the country. This 'wellbeing' is often in the form of greater tax revenues from new or extended mining projects or through better infrastructure and/or natural disaster planning.

Salary average 50,400€.

Course of study

Geology degree.

Networks

Geologists Association

Summary

A geologist is a professional with extensive knowledge in the field that can focus his professional future in a wide range of work, ranging from research, risk management and resources, teaching, etc.

To know more

<https://geologistsassociation.org.uk/>

Protected area manager

Activity description

The traditional role of managers has been to restore or maintain a certain state or the protected ecosystem, implying that the conservation goal of all protected areas is to secure the 'balance of nature'

Competences

Today's managers, staff and stewards are expected to:

- Protect species, habitats and ecosystems;
- Maintain ecosystem services, vital for local and national economies;
- Support local sustainable development and use of natural resources;
- Provide opportunities for tourism and recreation;
- Promote equitable forms of governance;
- Adopt entrepreneurial approaches for generating vitally needed funding;
- Argue the case for protected areas in government legislative and decision-making processes; and
- Manage large, complex organisations and work in partnership with other sectors.

Reference job market and economical treatment

Salary average 55,500€

Course of study

Environmental sciences and forest science and management, and postgraduates on Protected areas management

Networks

Environmental Managers Association

Summary

If your passion is to manage resources, and you love the nature, protected area management is your profession.

To know more

<http://emaweb.org/>

Wildlife Biologist

Activity description

Wildlife Biologists are scientists that observe and study the behaviors of animals. They frequently observe the features of certain wildlife and determine the creatures' role in specific ecosystems and/or how they interact with human beings. In addition, they will often perform various experiments to either increase our knowledge about a certain species or see how humans influence the ecosystem in question.

Competences

Needed competencies for a wildlife biologist are:

- Analytical skills
- Love to live outdoors.
- Nature awareness.
- Good physical condition

Reference job market and economical treatment

Average salary 49000€ per year.

Course of study

Bachelor in Biology. Many Wildlife Biologists will eventually specialize into a particular area of study defined by ecosystem or species. Some of these fields include: Entomology, Ornithology, Marine Biology, or Limnology.

Networks

Association of professional biology.

Summary

Wildlife Biologists are extremely important to preserving the current state of our environment and deepening our understanding of the other creatures that share our planet with us.

To know more

<https://professionalbiology.com/>

CHAPTER 6: CASE STUDIES

Sustainable business models for national parks & reserves: Kenya, Zimbabwe, Ethiopia & Rwanda

Context: Many of Africa's most important conservation landscapes fall within national protected area systems. With increasing demands on public purses, protected areas authorities face new pressures to build more sustainable business cases, but often lack the experience or capacity to do this. Conservation Capital is very actively engaged in this context - sometimes these engagements cover entire protected area systems, sometimes just individual protected area landscapes.



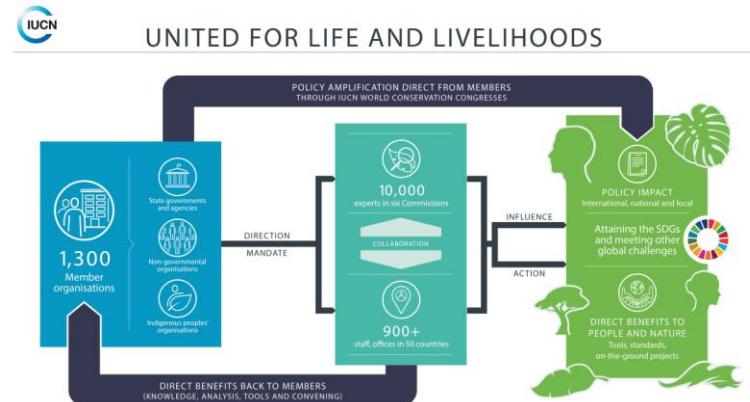
Protected Area Systems: Kenya and Zimbabwe > Historically, the Kenya Wildlife Service (KWS) entered into commercial contracts with third party tourism operators on a case-by-case basis. This resulted in an unstructured portfolio of partnerships that fostered complexity, inefficiency and low returns. Conservation Capital designed a uniform commercial formula for all tourism contracts that will double returns to KWS over time. Based on the success of this initiative, we developed a similar formula for ZimParks specifically designed to foster the regeneration of tourism operations in Zimbabwe following the widespread economic collapse of the late 2000's.

Individual Protected Areas: Simien Mountain NP (Ethiopia) & Nyungwe NP (Rwanda) > In addition to developing commercial solutions for entire protected area networks we have more recently been asked to develop bespoke business plans for individual national parks. We have completed such a plan in 2014 for Simien National Park in Ethiopia on behalf of the Ethiopian Wildlife Conservation Authority (EWCA) that has quickly catalysed a number of new commercial ventures. In 2015 we began a similar assignment for the Rwanda Development Board – this time focused on analysing options both for the commercial development of Nyungwe National Park, and the basis upon which this could be achieved within the context of a public-private co-management partnership with an international conservation NGO.

International Union for Conservation of Nature (IUCN)

The International Union for Conservation of Nature (IUCN) is a membership Union uniquely composed of both government and civil society organisations. It provides public, private and non-governmental organisations with the knowledge and tools that enable human progress, economic development and nature conservation to take place together.

Created in 1948, IUCN has evolved into the world's largest and most diverse environmental network. It harnesses the experience, resources and reach of its 1,300 Member organisations and the input of some 13,000 experts. IUCN is the global authority on the status of the natural world and the measures needed to safeguard it. Experts are organised into six commissions dedicated to species survival, environmental law, protected areas, social and economic policy, ecosystem management, and education and communication.



The ability to convene diverse stakeholders and provide the latest science, objective recommendations and on-the-ground expertise drives IUCN's mission of informing and empowering conservation efforts worldwide. IUCN provide a neutral forum in which governments, NGOs, scientists, businesses, local communities, indigenous peoples groups, faith-based organisations and others can work together to forge and implement solutions to environmental challenges.

By facilitating these solutions, IUCN provides governments and institutions at all levels with the impetus to achieve universal goals, including on biodiversity, climate change and sustainable development, which IUCN was instrumental in defining.

CHAPTER 7: LABORATORIES

Laboratory: Natural crisis

The idea

In this activity we will work with the students a simulation in which the students themselves will be part of a government that will have to face the management of a natural disaster; the students will have to investigate about the nature of the ecosystem where the disaster has occurred and they will have to be creative when proposing solutions as part of the government. This work aims to show the complexity involved in managing natural resources, improving communication skills and teamwork and research skills.

Learning objectives

The main aims of this laboratory are:

- Learning to manage complex situations
- Raising awareness about nature conservation
- Improving communication and organisational skills
- Learning to work together
- Improving researching skills

Who is the target

High school students.

Work tracks and realization

- First of all, the facilitator will divide the group in small groups of 6 students.
- For this activity we will select as many natural disasters (that have happened in reality) as number of groups. We are going to assign a natural disaster to each group.
- Students will have time to investigate what happened in the natural disaster for 20 minutes.
- Once the investigation is finished, the government will have to take the appropriate measures to solve the problem and think about measures to ensure that something like that will not happen again..
- Finally the groups will have to expose the rest of their classmates, what was the natural disaster they were facing and how they have resolved it, as well as the measures to ensure that something like that will not happen again.

The proposed natural crises may be current crises such as plastic pollution in the oceans, or past events such as the oil slick (spillage of fuel on the beaches), for example.

Laboratory: Year 3000

The idea

Through painting a mural, we are going to make the students think about environmental risks and how we should take care of the planet. We will work on the idea of two groups with two different scenarios with the students, where they will have to imagine what the world would be like in the future if we become aware of the environment and take care of it and how the world would be if we continue to contaminate it and do not take care of it.

Learning objectives

The learning objectives for this workshop are:

- Critical Thinking.
- Environmental awareness
- Communication Skills
- Researching skills

Who is the target

High school Students



Work tracks and realization

To make the activity we are going to:

1. Divide the group in two with the question 'Do you think that the world in the future will be a better world or a worst one?'
2. The optimistic and pessimistic group should think about, how the world will be in the future, in the 'Year 3000'.
3. The students should paint a mural in a big paper showing how will the world be in the future.
4. At the end the students will have to show their drawings and explain what they have drawn and what it means

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