

**Save biodiversity!
& beat the heat!**



**LIVE MORE
SIMPLY**

What is Biodiversity?

Biodiversity or Biological Diversity means the variety of life on earth. Biodiversity will include all living things like plants, animals, fungi, algae, microbes, their habitats and genes. Biodiversity is the foundation of life on Earth. It is crucial for the functioning of ecosystems which provide us with products and services without which we couldn't live.

Biodiversity occurs in three levels

1. species level,
2. ecosystem level and
3. genetic level.

Species

Species are all around us and are easy to know - all species are classified into five categories and about 1.8 million species of them that we know about, e.g. animals, plants, fungi, algae and microbes. These 1.8 million species have been discovered, described and named, but it is thought that as many as 5-100 million species inhabit the earth. See back cover diagram of the species level of Biodiversity

Ecosystem

All those species that live on the earth live together interact with each other and for this each species requires a particular type of home or habitat for its unique biological characteristics. Those homes or habitats are called ecosystems. The whole earth's surface can be described as a series of interconnected ecosystems. All living beings are form and part of the ecosystem. Different areas in this world house different ecosystems.

Genes

Genes are the carriers of DNA and DNA is the basic matter that all life forms get from parents of some kind which makes variation possible. Genetic diversity is responsible for variation within species. This variation occurs between individuals (every biological entity), populations (groups of individuals are different from other groups), communities (groupings of different populations that permit survival of species).

What is Climate Change?

Alteration in the regular weather sequence due to warming up in earth's climate system is called climate change.

The sun keeps our planet warm by sending rays into earth's atmosphere. The gases in the atmosphere (carbon dioxide, water vapour, nitrous oxide etc.) trap some of these rays while others bounce back. These kinds of gases which can trap heat near the earth's surface are called greenhouse gases. These are very essential for keeping earth's temperatures at the right levels for all life forms such as animals, plants and humans on earth to survive. They act much like a blanket keeping in warmth from the sun. If there were no greenhouse gases the earth would be -18°C cooler than the present atmospheric temperature. The same Greenhouse Gas is also responsible for climate change.

Now you may ask why do we blame Greenhouse Gases for climate change? Today's problem is that we are releasing too much of greenhouse gases, by over use of natural resources, which are absorbed by the atmosphere and create a thicker layer of gases around our planet. This result in trapping heat below the atmosphere which leads to global warming that ultimately influences the earth's climate.

Greenhouse Gases (a class of gases) can trap heat near Earth's surface



The GHGs increase in the atmosphere leads to **Global Warming** due to trapped extra heat

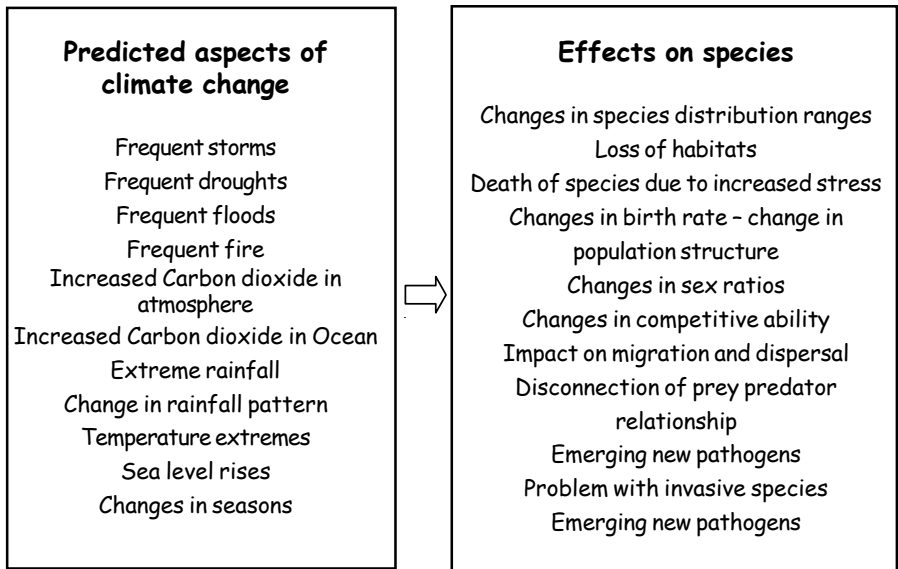


The global warming in turn places pressure on Earth's climate system that leads to **Climate Change**

How are Biodiversity and Climate Change related?

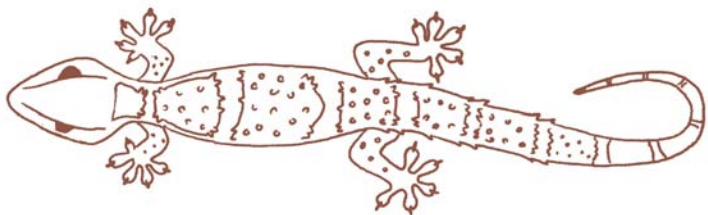
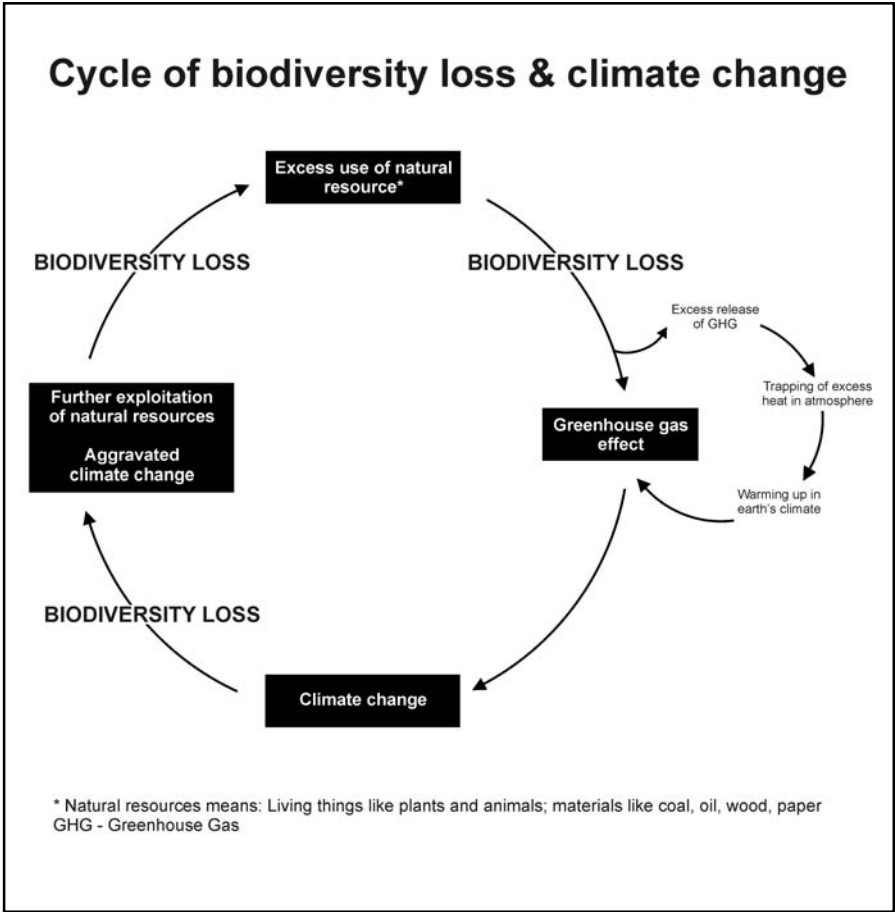
It has been accepted by scientists that climate change and biodiversity are interconnected and climate change is a new threat to the biodiversity. . If biodiversity is affected, it will bring negative impact for human well-being. Managing and conserving biodiversity has now become essential since biodiversity also contribute to climate change mitigation through the ecosystem services. For example forests if conserved, can remove carbon dioxide from the atmosphere, thus helping to address climate change by storing carbon.

Climate change will affect different areas of the world to different degrees. Some species can adapt to climate change while many species are susceptible to climate change. It all depends on a variety of biological traits including the species life history, ecology, behaviour, physiology and genetic makeup.



The present cause of Climate change is man-made. Excess use and over exploitation of natural resources through industrialization, land use pattern, deforestation, large scale farming of domesticated animals etc are the main cause of global warming that leads to climate change.

Relationship between Biodiversity and Climate Change



Introduction to Kingdom of life

Earth is home for a variety of living things and we call it as biological diversity or Biodiversity and human beings are an integral part of this diversity. For our convenience and understanding, all life on earth is divided into five kingdoms: Monera, Protista, Fungi, Plantae and Animalia. The animals within each kingdom are further grouped into smaller groups such as phylum, class, family, genus and species.

Importance of species and diversity

Human beings get their food, medicine, clothing and all other biological resources from the biodiversity. We depend on green plants to renew the oxygen we breath; we rely on bacteria to help us digest our food, we use wild relatives of crop plants as sources of genes to improve our crops, we benefit from biodiversity in many ways as transport, food and medicine. In short our lives would be infinitely poorer without the diversity of animals, plants and habitats.

Now-a-days biodiversity is threatened at an unprecedented rate due to habitat alteration, degradation and human misuses or over exploitation. If we do not conserve biodiversity, we will have problems in the economy at county level, peoples livelihood, food security, and supply for rapidly increasing population. It is an urgent need to re-examine the biodiversity issue since climate disruption is becoming one of the major driving forces for the loss of biodiversity.

Kingdom Animalia includes vertebrates and invertebrates

Vertebrates are animals with backbones - fish, amphibians (like toads & frogs), reptiles (snakes, etc), birds and mammals.

Invertebrates are animals without backbones like worms, dragonflies, bees, scorpions, spiders, etc.

Facts about Mammals

Mammals are vertebrates and have these characteristics

- mammary glands (females) for feeding her babies
- hair
- warm blood
- ability to run fast



There are 397 different kinds (species) from India alone

A few examples of kinds of mammals are: bears, monkeys, cats, pandas, bats, rats, wolves, deer, whales, etc.

Bird facts

- Birds are warm blooded vertebrates.
- Birds' body temperature remains same all the time.
- Birds have feathers & can fly.
- Birds lay eggs and take good care of their hatchlings
- Birds as a group are very speciose vertebrates ... 1232 kinds of birds occur in India and almost 10,000 in the world - so much diversity!



Facts about Amphibians

Amphibians are another vertebrate. Frogs, toads, newts, salamanders and caecilians are all called amphibians.

- Amphibians are cold blooded animals.
- Most amphibians eat crop-destroying insects and deadly disease-causing insects.
- Amphibians contribute much biodiversity
- There are more than 6000 amphibians in the world and 240 in India.



Reptiles - Facts about. . .

- Reptiles include snakes, lizards, turtles, tortoises, crocodiles, and alligators. They are cold blooded animals.
- There are about 4817 reptiles in the world, 460 of them occur in india.



Fish Facts

- Fish are also vertebrates
- Fish are cold blooded animals.
- Fish number about 30,100 species in the world and about 2546 reported from India.
- Close to 40% of all fish species live in freshwater.
- Over 700 species of fish are in danger of extinction



Invertebrates are animals without backbones

Eg. Insects, earthworm, snails etc.

98% of all animal species are invertebrates and only 2% are vertebrates



Facts about invertebrates

- A giant squid is the world's largest invertebrate at 18.4m.
- Some clams can live over 200 years.
- When cicadas sing its call can be louder than pneumatic drill.
- When a flea jumps, it accelerates 20 times faster than a rocket being launched into space.
- The combined weight of all insects is 12 times more than the weight of humans.
- Invertebrates live in and on our body eg. Louse
- Without bees pollinating plants we would have little in the way of fruit and vegetables.
- We know of about 1.8 million different kind of animals but..... scientists think there are upto 30 million more to be discovered nearly all invertebrates.

Invertebrates constitute over 98% of all described living animal species. Because of their number, variety and, influence on larger organisms and entire ecosystems, the invertebrates are called as "the little things that run the world" (Wilson, 1992). Some invertebrates do have negative impact on humans. All the negative impacts caused by few invertebrates become insignificant when compared to their beneficial actions.

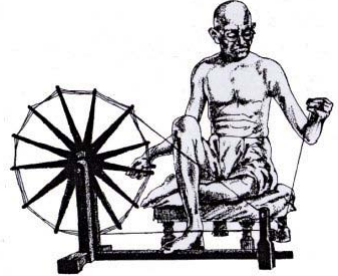
Invertebrates act as recyclers, pollinators and key food-chain organisms. Apart from this, invertebrates have an important economic, scientific, cultural and aesthetic value for mankind. A majority of the animals in the animal kingdom depend on invertebrates for food. Some invertebrates also serve as food for insectivorous plants. According to Biologist E.O. Wilson *"if all the vertebrates were to be wiped out, the worlds ecosystem would be upset for several years but if the invertebrates were to be wiped out our planet would never recover"*. We will not be able to survive for more than a few months without invertebrates. We consider invertebrates as pests, agents of diseases, nuisance and generally useless creatures. We strike them, spray them, and stamp them. The truth of the matter is that we need invertebrates but they dont need us! We have to understand these diverse and wonderful creatures - ants, beetles, bugs, butterflies, dragonflies, spiders, crabs, snails, which are indicators of healthy environment.

Live More Simply

Perhaps there is no one who has communicated the message of the simple life more than Mahatma Gandhi, Father of the Nation. Gandhi advocated living simply before the concepts of Loss of Biodiversity and Climate Change came about. His reasons were moral, spiritual, social and economic, but if Gandhi were here with us now and were asked to speak at a Biodiversity meeting or Climate Change colloquium, he probably would say about the same things he said in 1940s.

He might even wonder what was wrong with our minds that we had let things get to this point without simplifying our lives.

It is not hard to guess what might have been the beginning of what we only now admit has been an orgy of consumption, of overuse of all our natural resources, animal, vegetable, mineral, - live or dead, fresh or petrified. It was the industrial revolution which, once it got going, never looked back ... until now, maybe.



Mahatma Gandhi who was a defender of farmers, among others once said: *"The difference between what we do and what we are capable of doing would suffice to solve most of the world's problem"*.

He might have been talking of any of the world's serious problems but his words have special meaning now. We should take his statement fully to heart ... who among us is simply not capable of simplifying his lifestyle a bit at first and little by little continuing to do so. It would not take such a great effort as what Gandhi lived, but it will take more effort that we are giving now to save the biodiversity of the Earth. At the same time we would all contribute to turning back the ticking clock of climate change to levels that the Earth can tolerate, so that all life can continue to live.

The wisdom of Gandhi and our contemporary slogan go well together. ***The difference between what we do and what we are capable of doing would suffice to solve most of the world's problem - Mahatma Gandhi.***

Biodiversity is life...biodiversity is OUR life. Live more simply. Survive and permit all life to survive also.



Simplicity

Gandhi believed that a person involved in public service should lead a simple life. He displayed this principle by not wearing western-style clothing, which he associated with wealth and success. When he returned to India he renounced the western lifestyle he led in South Africa, where he had enjoyed a successful legal practice.

Gandhi dressed to be accepted by the poorest person in India, advocating the use of homespun cloth (*khadi*). He and his followers weaved their own clothes from thread they spun on a charkha, and encouraged others to do so.

Indian workers often bought their clothes from shops owned by British. The Swadeshi Movement encouraged Indians to make their own clothes, so as to deal an economic blow to the British in India. Gandhian simplicity was a sign and expression of *swadeshi* principles. He subsequently wore a dhoti for the rest of his life to express the simplicity of his life.

The practice of giving up unnecessary expenditure, embracing a simple lifestyle and washing his own clothes, Gandhi called "reducing himself to zero" to strengthen his humility. Gandhi spent one day a week in silence. He believed this gave inner peace and made him a better listener. This practice came from Hindu principles of *mauna*. Silent days he "spoke" with others by writing on paper. For three and a half years, from the age of 37, Gandhi refused to read newspapers, claiming that the tumultuous state of world affairs caused him more confusion than his own inner unrest. After reading John Ruskin's *Unto This Last*, he decided to change his lifestyle and create a commune called *Phoenix Settlement*. As a practitioner of *ahimsa*, Gandhi swore to speak the truth and advocated that others do the same. He lived modestly in a self-sufficient residential community and wore the traditional Indian *dhoti* and shawl, woven from yarn that he had spun by hand himself. He ate simple vegetarian food, experimented for a time with a fruitarian diet, and undertook long fasts as a means of both self-purification and social protest.



Mohandas Karamchand Gandhi
From Wikipedia, the free encyclopedia

Caretakers of the World

a small selection of International, National and Local NGOs working on both Biodiversity Loss and Climate Change.

As you know this booklet is about biodiversity loss and climate change which we have tried to explain a little. The following pages are about some of the international, national and local organisation which are involved with these important topics and from whom you can get good information. But before you read it you should know something about **ACRONYMS!**

These days, there is a new language. It is called "acronymese". It consists of acronyms (pronounced "ak-row-nims").

What is an acronym ?

An acronym is the short form of a series of words where the first letter of each make a pronounceable word, such as "IYB" for International Year of Biodiversity or by pronouncing each letter such as "I.Y.B."

Today there are many projects, organizations, institutions, documents, etc., which are involved with protection and promotion of nature and life on Earth. Each one has an acronym to represent it. There are so many; it is confusing! Once we learn what the acronym stands for, we then have to learn what that organization or project does ... and how it is important for each of us and our families and friends, ... for everyone.

The next pages list some important organisations which you can contact over the internet and get an amazing amount of help in understand biodiversity and climate change as well other topics. The web address is included. Check them out.

Wildlife Week

The Indian Board of Wildlife (IWBL) does a variety of activities to arouse public consciousness in favour of wildlife preservation in India. IWBL decided to observe the Wildlife Week from October 2 - 8 every year and the wildlife week is celebrated since 1957. Wildlife Week is probably one of the most participatory wildlife events in the world. A variety of organization, government and private institutes, zoos and NGOs celebrate this in a big way.

What is IYB ?

IYB is the acronym for the International Year Of Biodiversity.

IYB marks the agreement of almost the whole world to slow down the loss of biodiversity by 2010, ... thats this year ... NOW! Over 200 countries agreed to slow down loss of biodiversity at a big meeting in 2002. In October 2010, this year there will be another big meeting in Japan to see how we (the worlds people) have succeeded. All people interested in protecting nature and the Earth should spread the message of IYB to celebrate all wild organisms.



What is the CBD ?

CBD is an acronym for Convention on Biological Diversity

The Convention on Biological Diversity is dedicated to promoting sustainable development. It is a practical tool for translating principles into reality, recognizing that biological diversity is about more than plants, animals and micro-organisms and their ecosystems - it is about people and our need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live. **www.cbd.int**



Convention on
Biological Diversity

What is GEF ?

GEF is the acronym for Global Environment Facility

GEF unites 182 member governments in partnership with international institutions, nongovernmental organizations, and the private sector in order to address global environmental issues. It is an independent financial organisation which provides grants to developing countries for projects related to biodiversity. GEF also serves as financial mechanism for the CBD & UN Framework Convention on Climate Change (UNFCCC), **www.gef.org**



What is CITES

CITES stands for Convention on International Trade in Endangered Species of Wild Fauna and Flora, an international agreement between governments. It ensures international trade of wildlife does not threaten its survival. Because the trade in wild animals and plants crosses borders between countries, the effort to regulate it requires international cooperation to safeguard certain species from over-exploitation. CITES was conceived in the spirit of such cooperation. **www.cites.org**



What is the UN ?

UN stands for United Nations.

The United Nations was founded in 1945, long ago after a terrible world war. Then, 51 countries who wanted to maintain world peace, security, friendship, human standards and better living standards. Today the UN has 192 Members ... members are not individuals. UN members are nations. The work of the UN reaches every part of the world helping affect our lives and making the world a better place to live. Its goal and effort is for a safer world for us, now and in future.

www.un.org



What is UNEP ?

UNEP is an acronym for United Nations Environment Programme.

UNEP was mentioned earlier as the catalyst for suggesting that we use World Environment Day in a big way to call attention to the International Year of Biodiversity. UNEP has many projects and programmes relating to maintaining a safe and healthy environment. www.unep.org



What is IUCN ?

IUCN is an acronym for the International Union for Conservation of Nature.

IUCN is the oldest and largest and most influential conservation organization in the world, IUCN's vision is of a just world that values and conserves nature. IUCN has specialist groups for almost all animal and plant groups and also the themes of some conservation actions. ZOO interacts with several of these specialist groups such as bat, rodent, invertebrate, amphibian, reptile, primate, conservation breeding and reintroduction. www.iucn.org



What is Countdown 2010

Countdown 2010 is a network of active partners working together towards the 2010 Biodiversity Target. Each partner commits to specific efforts to tackle the causes of biodiversity loss. The Countdown 2010 Secretariat facilitates and encourages action, promotes the importance of the 2010 Biodiversity Target and assesses progress towards 2010. www.countdown2010.net



What is UNESCO ?

UNESCO stands for United Nations Educational, Scientific and Cultural Organisation

UNESCO works to create the conditions for dialogue among civilizations, cultures and peoples, based upon respect for commonly shared values so global visions of sustainable development encompassing observance of human rights, mutual respect and the alleviation of poverty might be achieved.

UNESCO's mission is to contribute to the building of peace, the eradication of poverty, sustainable development and intercultural dialogue through education, the sciences, culture, communication and information. www.unesco.org



What is WAZA ?

WAZA stands for World Association of Zoos and Aquariums

Its mission is to guide, encourage and support the zoos, aquariums, and like-minded organizations of the world in animal care and welfare, environmental education and global conservation. It is the unifying organization for the world zoo and aquarium community. Members are leading zoos, aquariums, associations and affiliate organizations from around the world, and together they are "United for Conservation." WAZA is promoting IYB in a big way, encouraging its member zoos to use its animal collection to illustrate the meaning and importance of it.

www.waza.org



What is CBSG ?

CBSG is an acronym for Conservation Breeding Specialist Group

CBSG is one of the 100 specialist groups under the SSC of IUCN. CBSG protects threatened species by increasing the effectiveness of conservation efforts worldwide by transforming passionate commitment to wildlife into effective conservation by networks of volunteers in almost every region. ZOO hosts CBSG, South Asia. www.cbbsg.org



What is IZE ?

IZE is an acronym for International Zoo Educators Association

IZE unites zoo educators globally and helps them increase their conservation impact. IZE connects members to the rest



What is CEE ? Centre for Environmental Education

CEE was created because of the importance of environmental education in India's environment and development strategy. Established as a Centre of Excellence in 1984, it is supported by the Ministry of Environment. CEE has regional centres all over the country. After 1994, CEE moved from environmental education to environmental action. Today, CEE works for a wide range of sectors, target groups and geographical areas. www.ceeindia.org

What is SAZARC ?

SAZARC is an acronym for South Asian Zoo Association for Regional Cooperation. ZOO hosts SAZARC and guides member zoos using its various taxon and thematic networks. It links all countries of South Asia in many of its activities. SAZARC reports are on the ZOO site. www.zooreach.org



What is ZOO and WILD ?

ZOO is an acronym for Zoo Outreach Organisation. ZOO is a 25 year old organization which was founded to help zoos improve their standards of animal care, education, research and training. As time went on ZOO expanded its objectives to cover a range of wildlife conservation activities. WILD is an acronym for Wildlife Information Liaison Development. WILD is a companion organization to ZOO which focuses on field or *in situ* conservation than zoo activities. ZOO and WILD share care of 8 regional networks each dealing with one taxon or thematic group. www.zooreach.org, www.zoosprint.org



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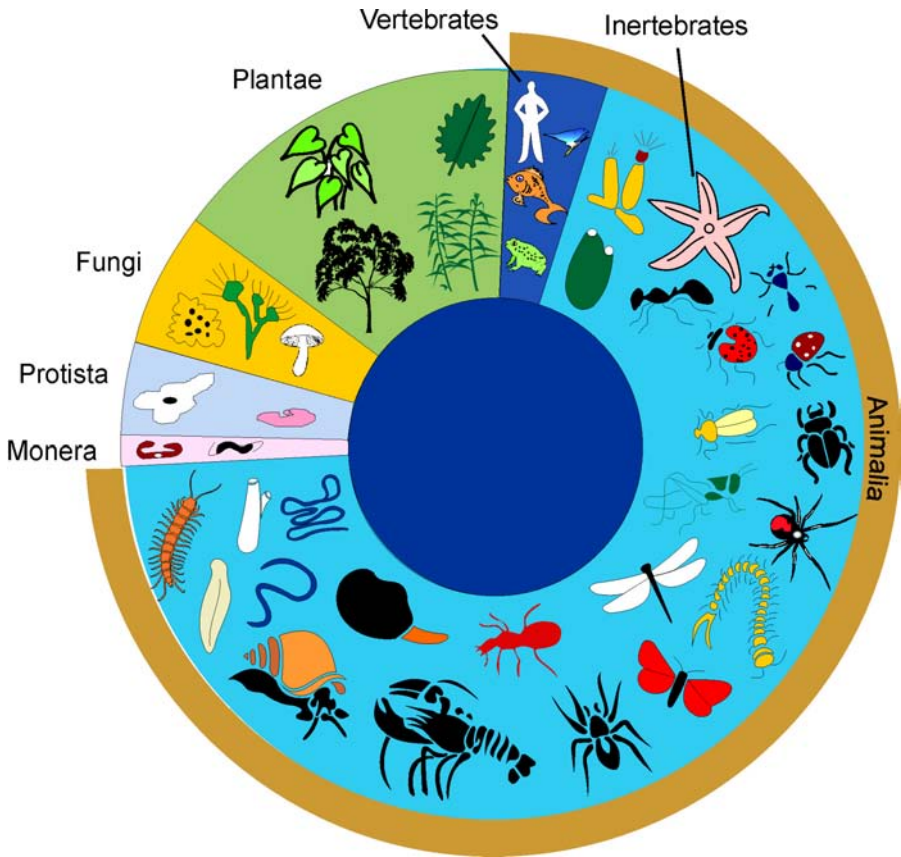


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The Circle of Life

E.O. Wilson



This is the Circle of Life drawn up by E. O. Wilson, the Father of Biodiversity. We humans might think that we are the dominant entity of the earth but it is not so. This drawing illustrates what a small proportion of the Circle of Life the vertebrate animals occupy. Ninety-nine 99% of the world's biodiversity is NOT humans and other vertebrate animals. It is Invertebrates, Plants, Bacteria, Protists, and Fungi! **We human need the rest of the species to insure our survival as well. Biodiversity is enormous and all of it is necessary to Life, our future on Earth.**