Name: _____

Date: _____

Class: _____

IB Environmental Systems and Societies

3.4 Conservation of Biodiversity

Significant ideas:

The impact of losing biodiversity drives conservation efforts.

The variety of arguments given for the conservation of biodiversity will depend on environmental value systems.

There are various approaches to the conservation of biodiversity, with associated strengths and limitations.

Reasons for Species and Habitat Preservation

1. A number of reasons to preserve biodiversity are listed below. Outline each one. For each one circle the appropriate word(s) to state whether this is an aesthetic, ecological, economic, ethical or social reason to preserve biodiversity. Each one may fall into one or multiple categories

Food sources (Aesthetic Ecological Economic Ethical Social)

Need to preserve a variety of food sources. Pests + disease may wipe out strains currently used as food.

Ecological services (Aesthetic Ecological Economic Ethical Social)

Preservation of as many species and as much natural or semi-natural habitats as possible may render the environment more stable

Economic Value (Aesthetic Ecological Economic Ethical Social)

many of the materials we use each day, other than food or medicine, are natural products eg palm oil, latex.

Educational Value (Aesthetic Ecological Economic Ethical Social)

We investigate and research the diversity of life as we value it. In order to learn about interactions of species we need to preserve them.

Biological control agents (Aesthetic Ecological Economic Ethical Social)

Some species of living things help us control invasive species without the use of potentially harmful chemicals

Gene Pools (Aesthetic Ecological Economic Ethical Social)

Wild animals and plants are sources of genes for hybridization and genetic engineering

Future unknown uses (Aesthetic Ecological Economic Ethical Social)

many more unknown practical benefits of biodiversity have yet to be discovered

Medicine (Aesthetic Ecological Economic Ethical Social)

many of the medicines used are derived from animals + plants. many medicines may not have been discovered yet.

Rights of indigenous peoples (Aesthetic Ecological Economic Ethical Social)

If biodiversity is protected, indigenous people can continue to live in their native lands

Recreation (Aesthetic Ecological Economic Ethical Social)

many people take vacations in areas of natural beauty and national parks which brings extra finance to the area

Ecotourism (Aesthetic Ecological Economic Ethical Social)

Biodiversity is the often the subject of aesthetic interest. People rely on wild places and living things in them for spiritual fulfillment

Biorights (Aesthetic Ecological Economic Ethical Social)

Biologically diverse ecosystems help to preserve their component species reducing the need for future conservation efforts on single species

International Cooperation and Conventions on Biodiversity

1.

a) What do the following acronyms stand for?

IGO

Intergovernmental organizations e.g. European Environment Agency (EEA)

GO

Governmental organization e.g. Environmental Protection Agency, USA (EPA)

NGO

non-governmental organization e.g. Greenpeace

b) Compare and contract the above types of organisation. Include examples of each on in your answer

IGOs tend to be more conservative (ie have a more conventional approach to conservation and are not likely to be controversial) whereas NGOs tend to be more radical. NGOs also tend to be field based, gathering information to back up their arguments, whereas IGOs tend to gather information from scientific research, which they pay for. e.g. UNEP works with direct links to governments of many countries WWF influence is indirect and depends on lobbying, pressure groups + public protest.

2. IGOs, GOs and NGOs are all involved in conservation. List and explain that factors affect how successful they are in ecosystem conservation and restoration.

Factor	Explanation
Use of media	IGO work with media so communicates its policies and decisions effectively to public. NGO Gain media coverage less directly
speed of response	NGO fast to respond, members have reached a consensus. IGO slower to respond due to bureaucracy and government involvment
political pressure	IGO decisions can be politically (and economically driven) rather than by best conservation strategy with NGOs.
public image	NGOs can be seen as confrontational and radical compared to more scientific and business-like approach of IGOs
Funding	IGOs fund projects with national budget whereas NGOs tend to use private donations.

3. Outline the role that the United Nations (UN) has had on biodiversity conservation.

International co-operation was formalized with the UN.
UNEP set up intergovernment panel on climate change and drove the montreal Protocol for phasing out CFC production.

4. The World Conservation Strategy (WCS), published in 1980, was pivotal in it's impacts on the conservation effort.

a) List the organisations involved (don't use acronyms)

International Union for the Conservation of Nature (IUCN)
United Nations Environment Programme (UNEP)
World Wide fund for Nature (WWF)

b) List the aims of the World Conservation Strategy.

- maintain essential ecological processes and life support systems
- preserve genetic diversity
- ensure the sustainable utilization of species and ecosystems.

5. In the space below draw a timeline showing major milestones in international cooperation in protecting biodiversity. (Draw it landscape if you want to).

1961 – World wildlife fund set up by IUCN + Julian Huxley

1966 – Species survival commission published Red Data Lists

1973 – Convention on the International Trade of Endangered species of Flora and Fauna (CITES)

1980 – world conservation strategy

1982 – Brandt commission published - beginnings of sustainable development

UN world Charter for nature

1987 – Brundtland commission on our common future - first defined

1991 – Caring for the Earth: A strategy for sustainable living

1992 – Earth summit Rio de Janeiro produced Agenda 21, Convention on Biological Diversity (CBD) and the Rio Declaration leading to BAPs (biodiversity action plans)

Earth council Global Biodiversity strategy

2000 – UN Millenium Summit and the Millenium Development goals (MDG)

2002 – World summit on sustainable development held in Johannesburg

2005 – World summit, new york

2010 – International year of Biodiversity

2012 – Rio + 20 - UN conference on sustainable development (UNSD)

Approaches to conservation

1. Conservation methods may involve habitat conservation or species conservation (and often a mixture of both).

Outline what is meant by the terms:

Species Conservation

These strategies focus on conserving the species but does not look at conserving the habitat in which it lives.

Habitat Conservation

These strategies focus on the conservation of a habitat so the species within that habitat can survive.

2.

a) What does CITES stand for?

Convention on International Trade in Endangered Species (CITES)

b) Outline the aim of CITES.

To ensure that the international trade in specimens of wild animals and plants does not threaten their survival

c) Species are group by CITES into three appendices. State the criteria for these:

Appendix I

Species cannot be ~~transferred~~ traded internationally as they are threatened by extinction

Appendix II

species can be traded internationally but within strict regulations ensuring its sustainability.

Appendix III

A species included at the request of a country which then needs the cooperation of other countries to help prevent illegal exploitation.

3. Captive breeding facilities include zoos and aquaria as well as other specialised facilities.

a) Outline what the term "captive breeding programme" means.

Species that are bred, or their DNA kept, in captivity.
Involves zoos and aquaria

b) Using the subheadings as a guide, evaluate the use of captive breeding programs

Examples of success stories

Californian condor
Przewalski's horse in mongolia
Black-footed ferret in wyoming, USA.

Difficulties in re-introduction to a habitat

Animals may have become used to humans e.g. Orang utans have to be taught how to climb + socialize with each other.
Plants may be dug up by collectors, outcompeted by other plants or eaten by herbivores

Ethical objections to zoos

sometimes animals are kept in close confinement in small cages or treated with cruelty. Large animals may be kept as this is what the public wants

Financial cost

Captive breeding programmes are expensive and projects need to be considered long term.

4. Summarise the function of seed banks

Where seeds, frozen or dry, are stored. A way of preserving the genetic variation of a species should they be lost in the wild. With crops the seeds can represent many more varieties of current species

5.

a) State what is meant by "flagship species". Include examples

These are species that are charismatic, instantly recognizable, popular and can capture our imagination e.g. giant panda

b) Evaluate the use of flagship species for conservation. Use the subheadings as a guide.

Instant appeal

These species are charismatic, instantly recognizable, popular. Their appeal means they can be used to ask for funds from the public e.g giant panda

"Umbrella" effects

The flagship species greatly help the other species in the same habitat - those under its umbrella

eg lemurs of madagascar

Prioritizing species

These flagship species can take priority over more ecologically significant species

Dangerous animals

Flagship species such as the Bengal tiger and the Asian elephant may come into conflict with humans either through their predatory behaviour or habitat destruction.

6.

a) What is meant by the term "keystone species"?

Keystone species are species that are vital for the continuing function of the ecosystem. Their disappearance can have an impact far greater than and not proportional to their numbers or biomass

eg. sea otters