Animal conservation
572 Zoo

Prepared by Dr Ghada Albasher

What is the conservation of species?

- Wildlife conservation refers to the practice of protecting wild species and their habitats in order to maintain healthy wildlife species or populations and to restore, protect or enhance natural ecosystems.
- Important characteristics of conservation biology are that it is a crisis discipline and it is holistic.
- It needs integration of research and management, and a range of relevant skills, along with flexible funding to allow for inevitable changes in conservation research.
- Conservation, study of the loss of Earth's biological diversity and the ways this loss can be prevented.

What is the conservation of species?

- Biological diversity, or biodiversity, is the variety of life either in a particular place or on the entire planet Earth, including its ecosystems, species, populations, and genes.
- Animal conservation is the act of protecting ecosystems and environments to protect the animals that live there .
- The importance of animal conservation is immeasurable, at a time where our planet is currently experiencing the sixth major extinction event in the 3.6 billion years that life has been on it.

Why is environmental conservation important?

- Environmental conservation protects wildlife and promotes biodiversity.
- Maintaining a healthy and functional ecosystem helps prevent the extinction of certain animal species.
- If the environment is destroyed, some animals are forced out of their habitat, making it hard for them to survive elsewhere.
- Conservation is involved with studying all these kinds of losses, understanding the factors responsible for them, developing techniques to prevent losses, and, whenever possible, restoring biodiversity.

Why is environmental conservation important?

- Conservation, study of the loss of Earth's biological diversity and the ways this loss can be prevented.
- Biological diversity, or biodiversity, is the variety of life either in a particular place or on the entire planet Earth, including its ecosystems, species, populations, and genes.
- Conservation thus seeks to protect life's variety at all levels of biological organization.

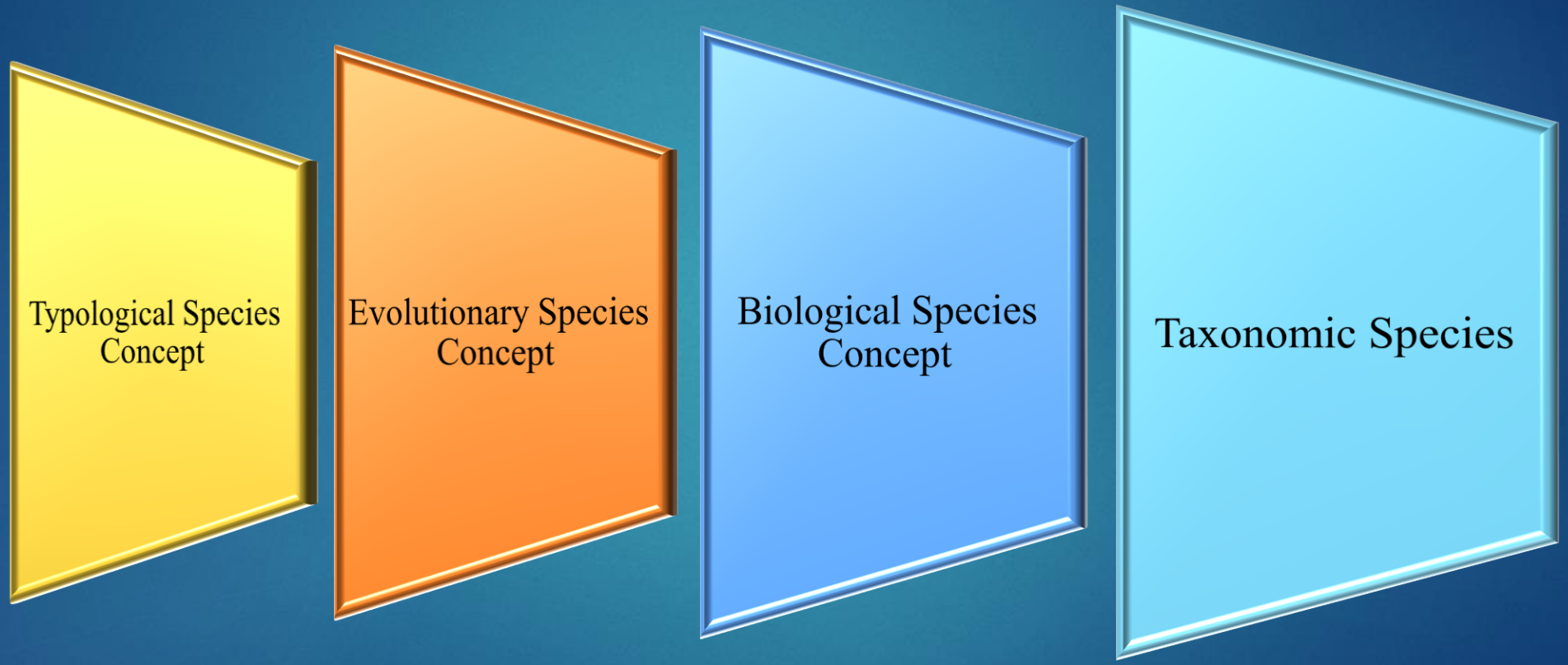
What defines a species?

- A species is often defined as a group of organisms that can reproduce naturally with one another and create fertile offspring.
- Species traits are defined as qualities of all organisms of a species, like body mass, length or height.
- Due to intraspecific variation different organisms of a species have different trait values, e.g. different body masses, but together they define a distribution, which is characteristic for each species.

What defines a species?

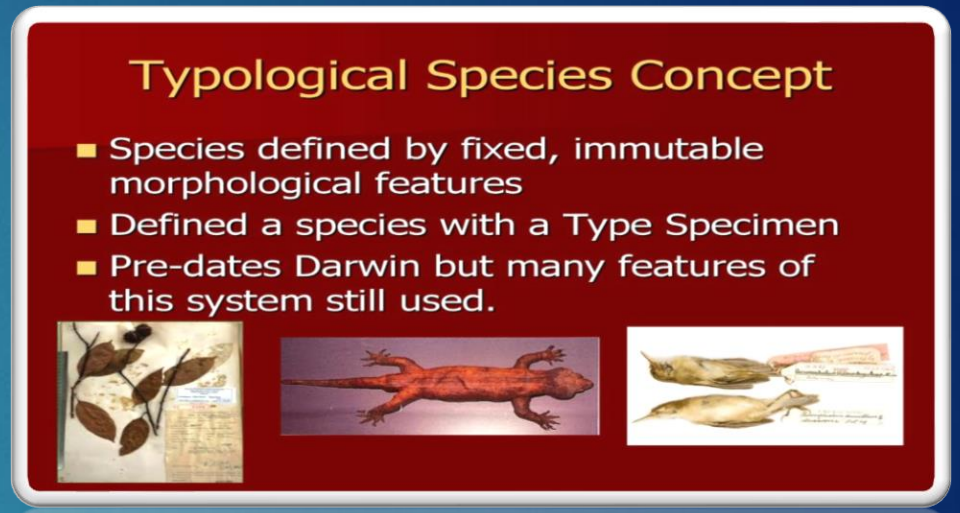
- A species is often defined as the largest group of organisms in which any two individuals of the appropriate sexes or mating types can produce fertile offspring, typically by sexual reproduction.
- Other ways of defining species include their karyotype, DNA sequence, morphology, behaviour or ecological niche.
- A species is often defined as a group of organisms that can reproduce naturally with one another and create fertile offspring. However, the classification of a species can be difficult—even riddled with controversy.

What are the main types of species?



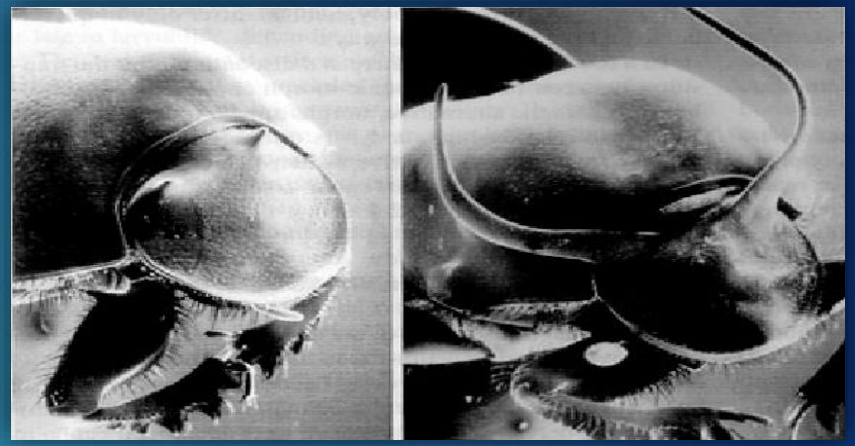
Typological species concept:

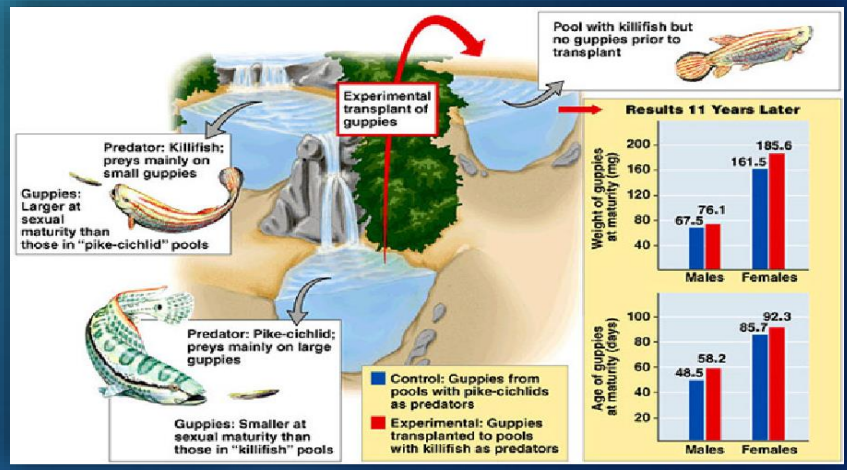
- Typological Species Concept: a group of organisms conforming to a common morphological plan, emphasizing the species as an essentially static, non-variable assemblage.
- Geneological Species Concept: an exclusive group of organisms whose members more closely resemble one another than members of any outside group.
- Typological (or Essentialist, Morphological, Phenetic) species concept. Typology is based on morphology/phenotype. Stems from the Platonic "forms".
- In paleontology all you have is morphology: typology is practiced and species are defined as morphospecies (e.g., snail shells in fossil beds).



Some problems with the typological species concept

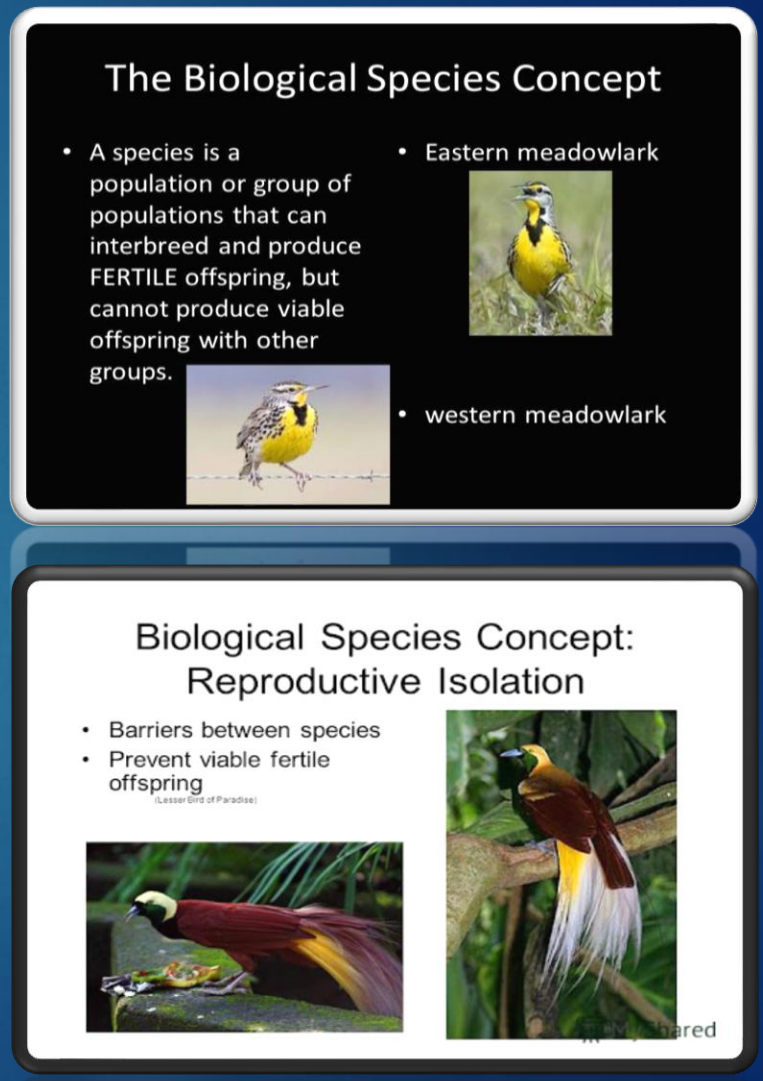
- It ignores evolution: species are not “unchanging entities”
- Artificial selection: artificial selection for oil content in corn.
- A fundamental drawback to this concept is that it is exclusively defined in terms of sexual reproduction.
- Asexual taxa are obviously excluded from this concept, but it is also true that many species capable of sexual reproduction cannot be easily accommodated within the framework of the biological species concept.





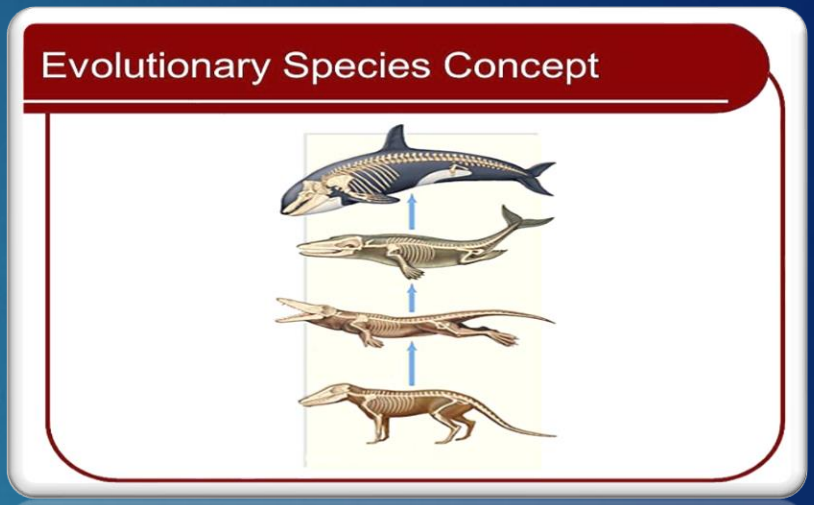
Biological species concept

- The Biological Species Concept defines a species taxon as a group of organisms that can successfully interbreed and produce fertile offspring.
- According to that concept, a species' integrity is maintained by interbreeding within a species as well as by reproductive barriers between organisms in different species.
- Humans living on opposite sides of the world can mate and produces fertile offspring, but you can't produce fertile offspring with a different species, like the Chimpanzee.
- For instance, a dog living in Australia and a dog living in Africa are unlikely to meet but could have puppies if they did.
- In order to be considered to be a single species in the biological species concept, a group of organisms must produce healthy, fertile offspring when they interbreed.



Evolutionary species

- An evolutionary species “is a single lineage of ancestor-descendant populations of organisms which maintains its identity from other such lineages in space and time and which has its own evolutionary tendencies and historical fate” (Wiley, 1981).
- Simpson (in 1961) had defined it as “an evolutionary species is a lineage (an ancestral- descendant sequence of populations) evolving separately from others and with its own unitary evolutionary role and tendencies”.

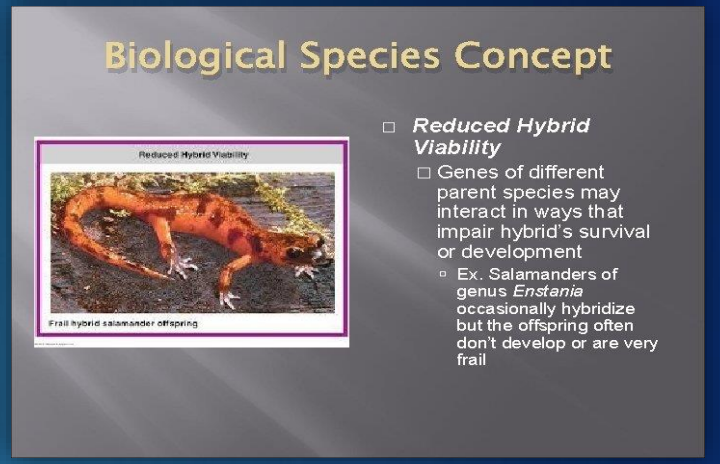


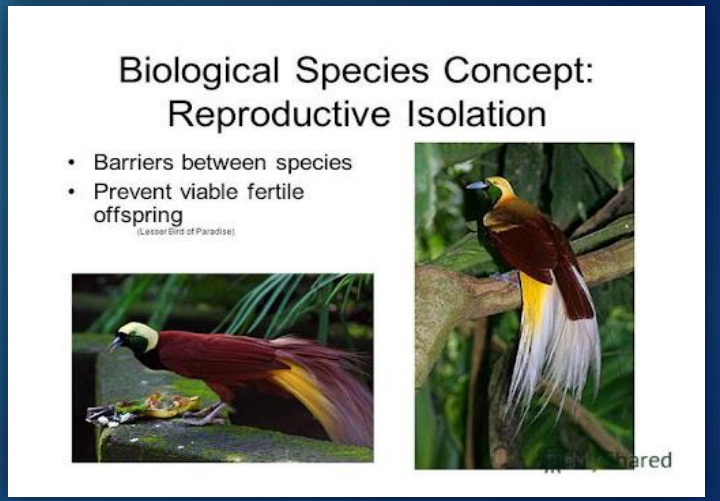
Evolutionary Species Concept

- a lineage which occupies an adaptive zone minimally different from that of any other lineage in its range and which evolves separately from all other lineages outside of its range (Van Valen 1976).

Biological species

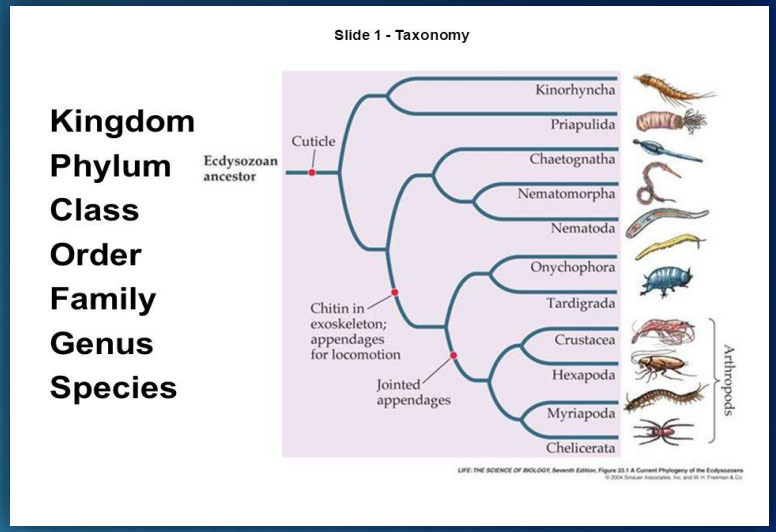
- A biological species is a group of organisms that can reproduce with one another in nature and produce fertile offspring.
- Taxonomy is a scientific system that classifies organisms into categories based on their biological characteristics.
- Species can also be defined based on a shared evolutionary history and ancestry.
- According to the most widely used species definition, the biological species concept, a species is a group of organisms that can potentially interbreed, or mate, with one another to produce viable, fertile offspring.
- For example, when a female horse and a male donkey mate, they produce hybrid offspring called mules.





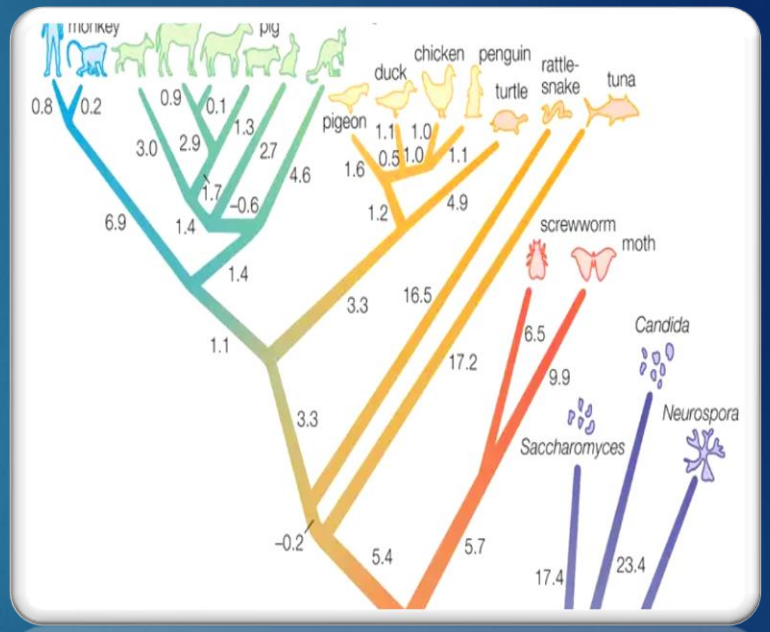
Taxonomy

- The branch of biology that deals with the systematic classification and naming of species (or groups of species) (long pre-Darwinian history).
- Linnaean Classification
- Kingdom: Animalia
- Phylum: Chordata
- Subphylum: Vertebrata
- Class: Mammalia
- Subclass: Eutheria
- Order: Primates
- Suborder: Anthropoidea
- Family: Pongidae
- Subfamily: ~
- Genus: Gorilla
- species: gorilla



Identifying and cataloging species

- The identification of lineages in species developed tremendously following the advent of molecular biology.
- Certain kinds of molecular information, especially DNA sequences, can provide clearer support than morphological data ever could for species identification, particularly when species clusters are similar in appearance.
- Molecular characters can often be identified less ambiguously than morphological characters.
- Species identification is extremely important for the conservation of biodiversity, but achieving a reasonable estimate of the total number of species on Earth has been elusive.
- About 1.9 million species have been named, yet estimates of the total number of species may be anywhere from 8.7 million (a figure that mainly considers eukaryotes any cell or organism that possesses a clearly defined nucleus, to possibly 1 trillion (when estimates of the potential number of bacteria species are included

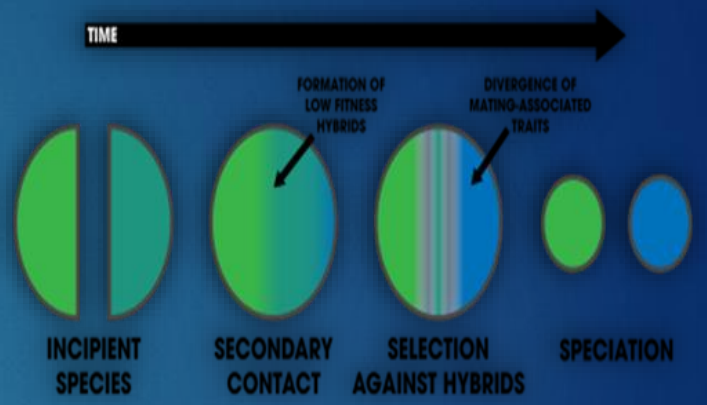


What is species conservation?

- Wildlife conservation refers to the practice of protecting wild species and their habitats in order to maintain healthy wildlife species or populations and to restore, protect or enhance natural ecosystems.
- Habitat destruction is the main threat to 85 percent of all threatened and endangered species, according to the International Union for Conservation of Nature.
- You can help reduce this threat by planting native trees, restoring wetlands or cleaning up beaches in your area.
- Wildlife conservation is the practice of protecting plant and animal species and their habitats. As part of the world's ecosystems, wildlife provides balance and stability to nature's processes.
- They work with the government to establish and protect public lands, like national parks and wildlife refuge

Speciation

- Speciation is the evolutionary process by which populations evolve to become distinct species.
- The biologist Orator F. Cook coined the term in 1906 for cladogenesis, the splitting of lineages, as opposed to anagenesis, phyletic evolution within lineage.
- Charles Darwin was the first to describe the role of natural selection in speciation in his 1859 book On the Origin of Species. He also identified sexual selection as a likely mechanism, but found it problematic.
- There are four geographic modes of speciation in nature, based on the extent to which speciating populations are isolated from one another: allopatric, and sympatric.

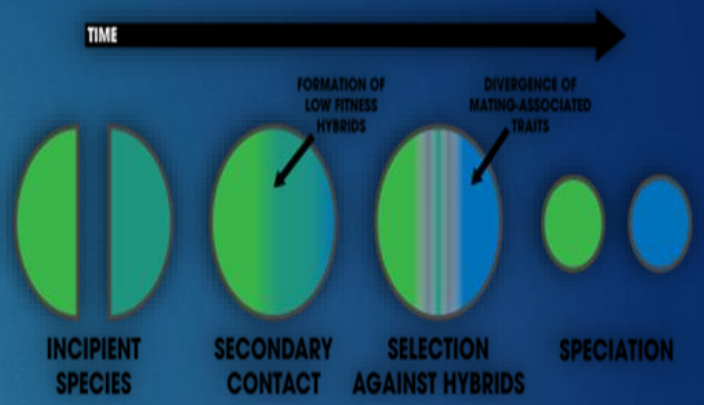


Characteristics of Invasive Species

- High reproductive rate
- Pioneer species
- Short generation time
- High dispersal rates
- Single-parent reproduction (gravid females can colonize)
- Vegetative or clonal reproduction
- Phenotypically plastic
- Broad native range
- Habitat generalist
- Polyphagous
- Human commensal

Speciation

- Speciation may also be induced artificially, through animal husbandry, agriculture, or laboratory experiments.
- Whether genetic drift is a minor or major contributor to speciation is the subject of much ongoing discussion.
- Rapid sympatric speciation can take place through polyploidy, such as by doubling of chromosome number; the result is progeny which are immediately reproductively isolated from the parent population.
- New species can also be created through hybridization followed—if the hybrid is favored by natural selection—by reproductive isolation.



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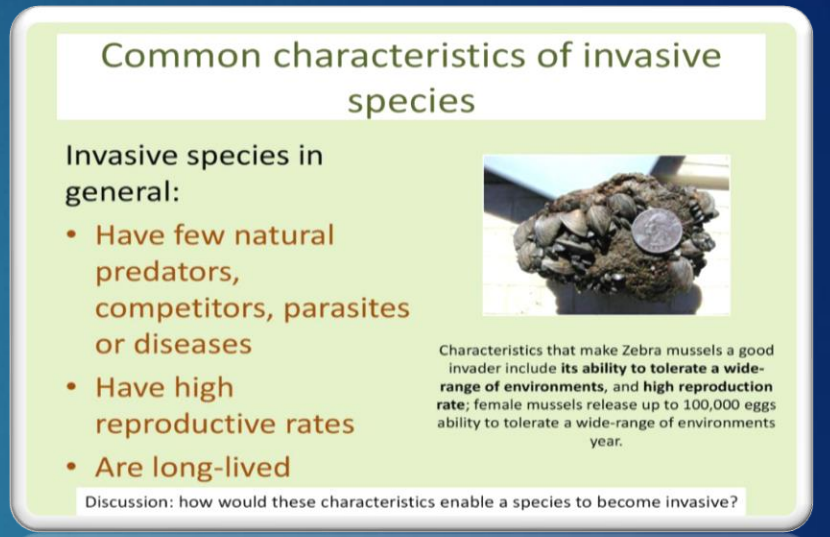
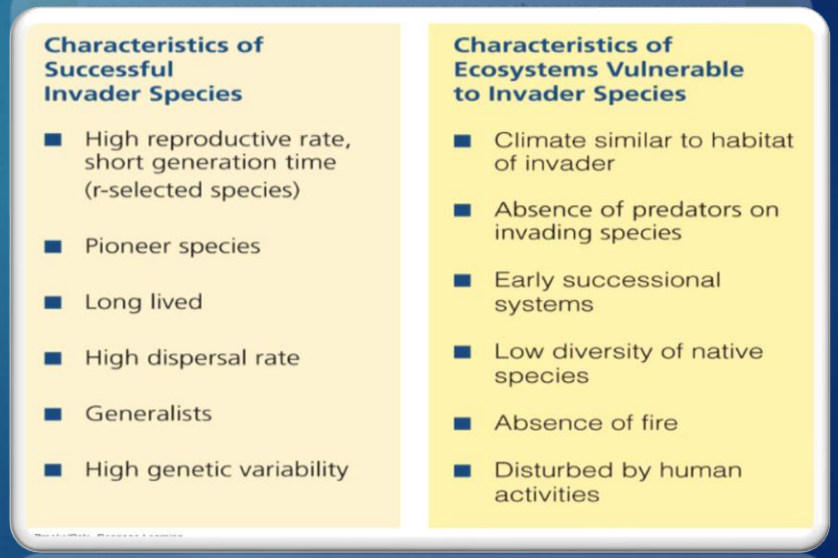




Characteristics of invasive species

- Common characteristics of IAS include rapid reproduction and growth, high dispersal ability, phenotypic plasticity (ability to adapt physiologically to new conditions), and ability to survive on various food types and in a wide range of environmental conditions.
- Invasive species are capable of causing extinctions of native plants and animals, reducing biodiversity, competing with native organisms for limited resources, and altering habitats.
- This can result in huge economic impacts and fundamental disruptions of coastal and Great Lakes ecosystems
- Rapid reproduction.
- High dispersal ability.
- Phenotype plasticity (the ability to alter growth form to suit current conditions)
- Tolerance of a wide range of environmental conditions (Ecological competence)

Ten of the world's most invasive species

- Cane Toad (Rhinella marina)
- European Starling (Sturnus vulgaris)
- Kudzu (Pueraria montana var
- Asian long-horned beetle (Anoplophora glabripennis)
- Small Indian mongoose (Herpestes auropunctatus)
- Northern Pacific seastar (Asterias amurensis)
- Water hyacinth (Eichhornia crassipes)

Cane toad

- Sea toad, also known as American giant toad, sugar cane toad, cane toad or cane toad, is a terrestrial toad native to tropical regions in Central and South America.
- It was later introduced to Australia and widely distributed on the east coast and north of the Australian continent. area.
- Their reproductive ability is very strong, and they can lay thousands of eggs at a time. Adults are 10-15 cm long; the largest specimen on record weighs 2.65 kg and is 38 cm long.
- Sea toads have venomous glands, and tadpoles are also highly toxic to most animals.

European starling (sturnus vulgaris)

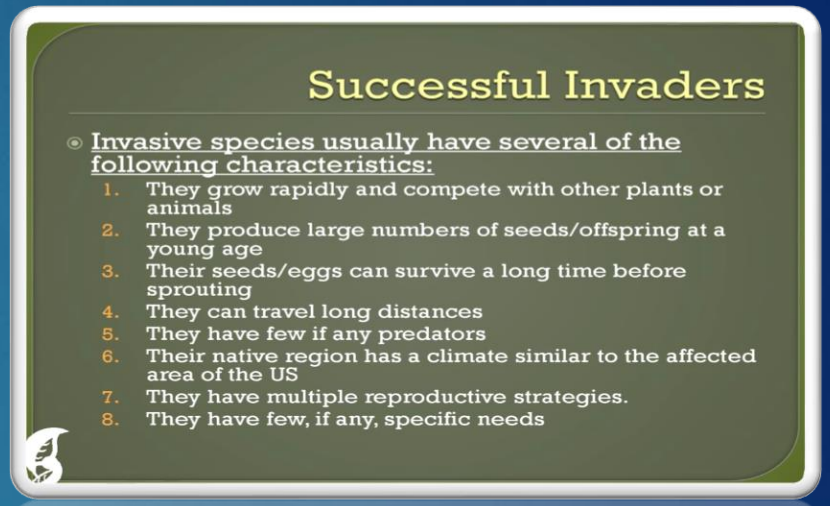
- The European starling is a bird of the genus Starling of the family Starling, commonly known as the black spotted starling and the Asian starling.
- Distributed in Europe, Iran, Iraq, Nepal, India, North America, and Xinjiang, Qinghai, Gansu, Ningxia, Tibet, Hebei, Shandong, Fujian, Guangdong and other places in Europe, Iran, Iraq, Nepal, and other places, mainly living in oasis bushes, nesting in tree holes . T
- he model origin of this species is in Sweden.
- The Invasive Species Expert Group of the International Union for Conservation of Nature's Species Survival Committee is listed as the world's top 100 invasive alien species.
- They are considered invasive by the US Fish and Wildlife Service. Their corrosive droppings can damage all kinds of objects and surfaces.
- They spread the seeds of weeds and eat large amounts of grain crops. Because of their enormous flocks, they can interfere with aviation

Asian long-horned beetle (anoplophora glabripennis)

- The Asian long-horned beetle threatens our hardwoods.
- The ALB has the potential to cause more damage than Dutch elm disease, chestnut blight and gypsy moths combined, destroying millions of acres of America's treasured hardwoods, including national forests and backyard trees.
- This beetle adversely affects the human environment by killing valuable shade and park trees, as well as injuring or even killing forest trees of economic value (e.g., sugar maples in the northeast USA).

Characteristics of invader species

- These include what they eat, their size, how many offspring they produce, and how long young take to mature.
- The findings come from a review of 49 investigations into the traits that enable species to establish or become invasive in a new area.
- Common characteristics of IAS include rapid reproduction and growth, high dispersal ability, phenotypic plasticity (ability to adapt physiologically to new conditions), and ability to survive on various food types and in a wide range of environmental conditions



EXAMPLES OF INVADER SPECIES

- Asian Carp.
- Zebra Mussel (Dreissena polymorpha)
- Cane Toad (Rhinella marina)
- European Starling (Sturnus vulgaris)
- Kudzu (Pueraria montana var
- Asian long-horned beetle (Anoplophora glabripennis)
- Small Indian mongoose (Herpestes auropunctatus)

ASIAN CARP

- The zebra mussel (Dreissena polymorpha) is a small freshwater mussel.
- The species was originally native to the lakes of southern Russia and Ukraine, but has been accidentally introduced to numerous other areas and has become an invasive species in many countries worldwide.
- Zebra mussels are an invader, fingernail-sized mollusk that is native to fresh waters in Eurasia

SMALL INDIAN MONGOOSE

- The small Indian mongoose has had a major impact on native species in the areas where it has been introduced.
- In most cases the native wildlife in these areas evolved in the absence of predatory mammals so they are particularly threatened by mongoose predation.
- Mongooses are unlikely to rank anywhere on lists of the most popular or lowest-maintenance pets because, frankly, they are not common pets.
- A mongoose, with its slender small frame and beautiful grizzled or marked fur, may seem like an ideal animal to tame and keep as a cute household pet.


Thank
You