

**Conservation 1404 - Chapter 4**  
**Pages 82 - 99**  
**“The Least You Should Know”**

**Vocabulary:**

Fossils

Mutations

Natural Selection

An adaptation = an adaptive trait

Coevolution

Ecological niche = niche

Realized niche

Generalist species

Specialist species

Evolutionary divergence

Speciation

Geographic isolation

Reproductive isolation

Endemic species

Background extinction

Mass extinction

Artificial selection

Genetic engineering = gene splicing

Recombinant DNA

Genetically-modified organisms = GMO's = transgenic organisms

Biopharming

**Concepts:**

Populations evolve, not individuals

Know how evolution works

1<sup>st</sup> step genetic variability, usually through mutations  
(most mutations are lethal, rarely are beneficial)

2<sup>nd</sup> step – natural selection “Survival of the Fittest”

“Genes mutate, individuals are selected, and populations evolve that are better adapted to survive and reproduce under existing environmental conditions”

Populations of genetically diverse species and of species that reproduce quickly can adapt to changes in environmental conditions rapidly.

Slow evolution are genetically similar, slow-reproducing species. Evolution takes thousands to millions of years for these species.

Common misconceptions about evolution:

a) survival of the fittest means survival of the strongest. Not always so.

- b) Organisms develop traits because they want them or need them. Not so – it's random.
- c) Evolution by natural selection involves some grand plan towards perfection of the species. Not so – the environment is always changing, and so do the species.

Specialists have a survival advantage when conditions are unchanging, e.g. a tropical rainforest. Generalists can evolve quickly when conditions change.

Endemic species are especially susceptible to extinction

99.95 of all species that ever existed are now extinct.

We have had 5 major mass extinctions on Earth, and numerous mass depletions. They seem to be at about 140 million-year intervals.

