

Taxonomy and the Vertebrates

I. Taxonomy

A. Defined

B. Carolus Linnaeus (1707-1778)

1. Binomial system – Genus and Species

2. Nested Classification System

a. Traditional

Kingdom, Phylum, Class, Order, Family, Genus, Species

b. How to define “similar organisms”?

C. 3 Domain or 6 Kingdom systems

Bacteria

Archaea

Protista

Plants

Fungi

Animals

II. Subphylum Vertebrata

A. Defined

Vertebrae

Spinal cord

Advanced CNS with skull to protect brain

Internal skeleton of cartilage or bone

B. Classes of Vertebrates

1. Class Agnatha - lamprey and hagfish
Jawless, limbless, cartilaginous fish
(separate hagfish and lampreys?)
Cephalaspidomorphi?
2. Class Chondrichthyes - sharks, rays, skates
Cartilaginous fish
gill slits
heavier than water, must swim or sink
3. Class Osteichthyes
boney fish
gill cover - operculum
swim bladder
Ray finned and lobe finned
Coelacanth
Lungfish
4. Class Amphibia - salamanders, frogs, toads
Water/land or larvae/adult
First terrestrial vertebrates, probably from lobe-finned fish
Require moisture for reproduction & breathing
3 chambered heart
5. Class Reptilia - snakes, lizards, turtles, crocodiles.
Adapted for land environment
dry, scaly skin (keratin)
internal fertilization
amniotic eggs with leathery shells
lungs, limbs more efficient
6. Class Aves – birds
Adaptations for flight
Hollow boned
No urinary bladder
Small repro systems
Wings/feathers
Endothermic
Efficient circ/resp system

- 7. Class Mammalia
 - mammary glands
 - hair
 - muscular diaphragm
 - 4 chambered heart
 - highly developed nervous system
 - major groups -
 - monotremes - egg laying
 - marsupials - pouched
 - placental - 95% of mammals

III. Threatened and Endangered Species

A. Categories

From the Endangered Species Act:

Endangered - The term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man.

Threatened - any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Species of concern: An informal term referring to a species that might be in need of conservation action

Federal or State Threatened or Endangered

Federal Species of Concern/State Special Concern

B. Threatened or Endangered in our area

IV. Ecological Principles

A. Food Web

B. Keystone Species

C. Predator-Prey interaction

V. More Information

- A. Species Information from Virginia Fish and Wildlife Information Service
<http://www.vafwis.org/WIS/ASP/default.asp>
- B. Animal Diversity Web from University of Michigan Museum of Zoology
<http://animaldiversity.ummz.umich.edu/site/index.html>
- C. eNature. Online field guides from the National Wildlife Foundation
<http://www.enature.com/home/>
- D. Wildlife Information from VA Department of Game and Inland Fisheries
<http://www.dgif.state.va.us/wildlife/>
- E. US Fish and Wildlife Service. Endangered Species Program
<http://www.fws.gov/endangered/>

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March 31, 2008