

# EVOLUTION –The Rate of Evolution and The Impact of Extinction

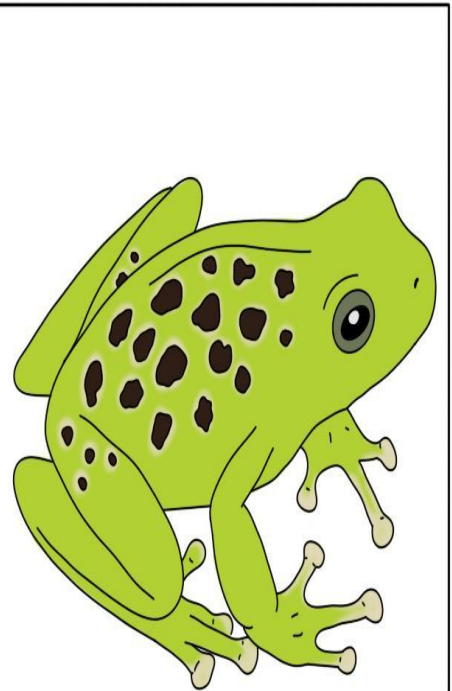




# What is a NICHE?

## NICHE EXAMPLE:

### BARKING TREE FROG



### NICHE

Habitat: wooded regions, wetlands

Behaviors: often found in trees, can burrow, barking call attracts mates

Feed on: small insects

Eaten by: birds, snakes, raccoons

Impact on ecosystem: limit insects, aerate soil, serve as food source



- Ecological niche entails the following:
- Habitat or the specific area where an organism inhabits,
  - The role or function of an organism or species in an ecosystem.
  - Interrelationship of a species with all the biotic and abiotic factors affecting it

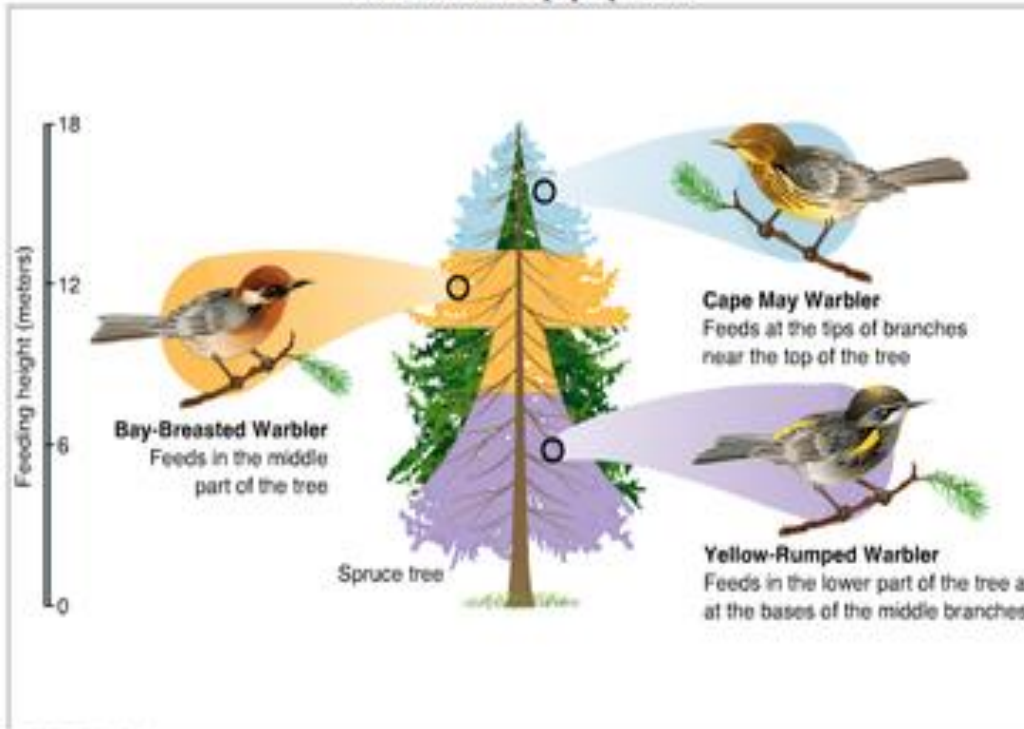
In ecology, the term “niche” describes **the role an organism plays in a community**. A species' niche encompasses both the physical and environmental conditions it requires (like temperature or terrain) and the interactions it has with other species (like predation or competition)

# NICHE Competition

If two similar animals, two similar plants, two similar fungi, two similar protists, or two similar bacteria try to occupy the same Niche..... Only ONE will succeed.

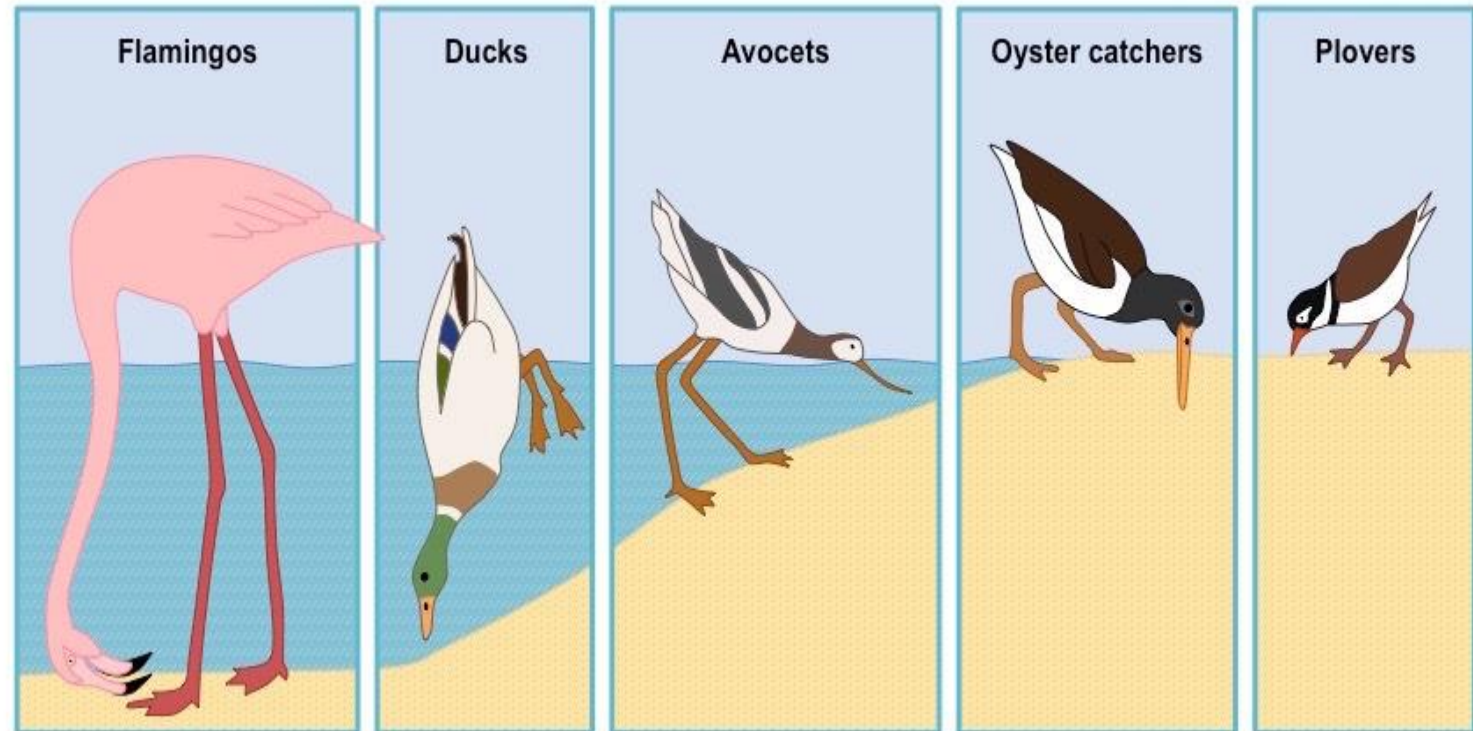
The other will have to try to occupy another Niche..... or it will compete vs other species to see which will attain that niche. Winner gets that Niche, loser becomes EXTINCT.

warblers in the pop-up menu.



**Warbler Niches** Each of these warbler species has a different niche in its spruce tree habitat. By feeding in different areas of the tree, the birds avoid competing with one another for food. **Inferring** What would happen if two of the warbler species attempted to occupy the same niche?

**Resource Partitioning:** Species alter their use of the niche to avoid competition, by dividing resources among them





# ROLE OF EXTINCTION

When catastrophic events take place, many plants, animals, fungus etc. get wiped out, this will then lead to many open NICHES.

OPEN NICHES = OPPORTUNITY

Example: What if all sea snails (marbles) are wiped out for marble-bills, but a new species of gummy bear food source evolves for the marble-bills?





**Mass Extinction gives opportunity for  
Less desirable members to branch off  
And occupy the open niche.... SPECIATION**

**Mount St. Helens –  
BEFORE and AFTER – May 18<sup>th</sup> 1980**

[Video Clip Link](#)





# OPEN NICHES = OPPORTUNITY

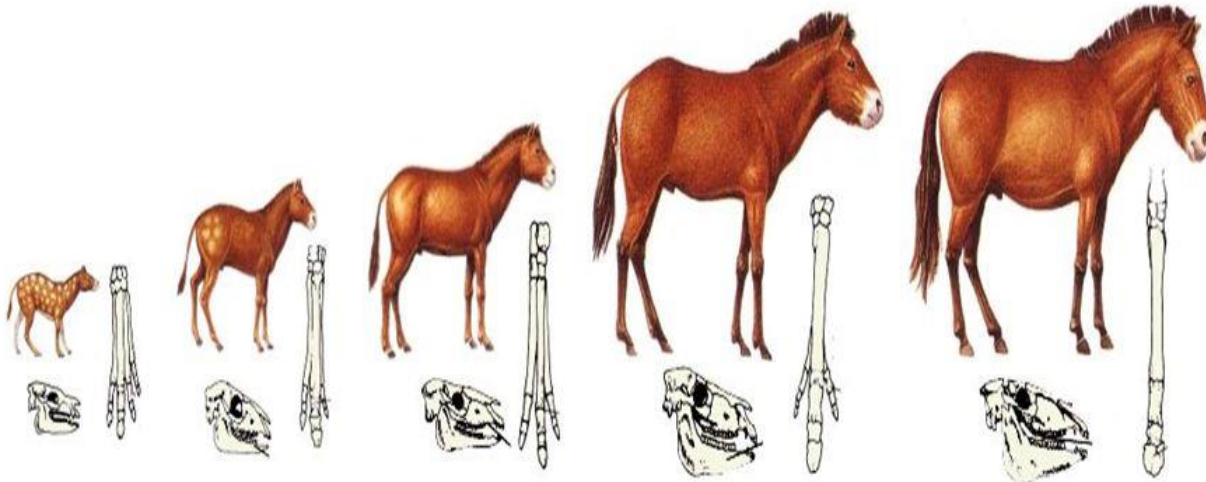




# RATES OF EVOLUTION

## GRADUALISM vs. PUNCTUATED EQUILIBRIUM

### Ex Gradualism



Eohippus

Mesohippus

Miohippus

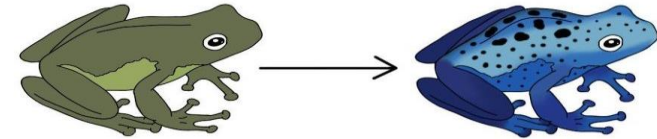
Merychippus

Pliohippus

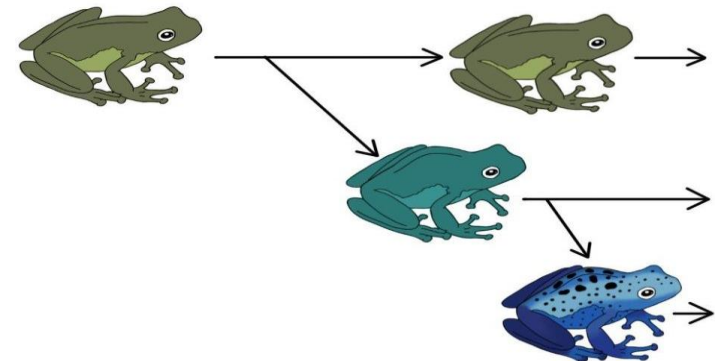
### PUNCTUATED EQUILIBRIUM

- Long periods of little or no change
- Short bursts of drastic change

How would this transformation happen?



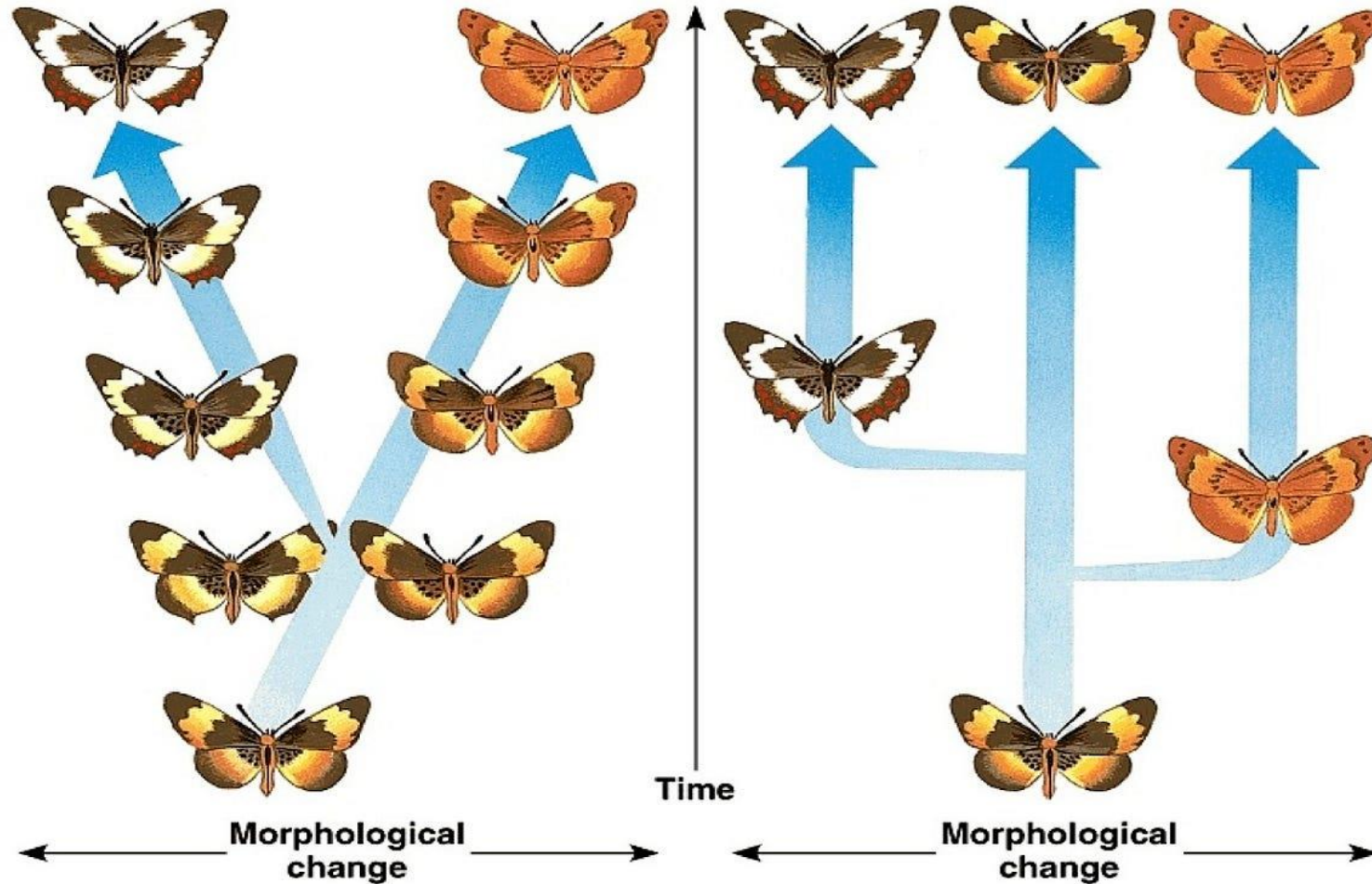
In terms of punctuated equilibrium, it would look something like this:



**Think about it!**

**Most organisms are already well-adapted to their environment. They only really need to gain new adaptations if their environment changes**

# Catastrophic changes and mass extinction pave the way for Punctuated Equilibrium



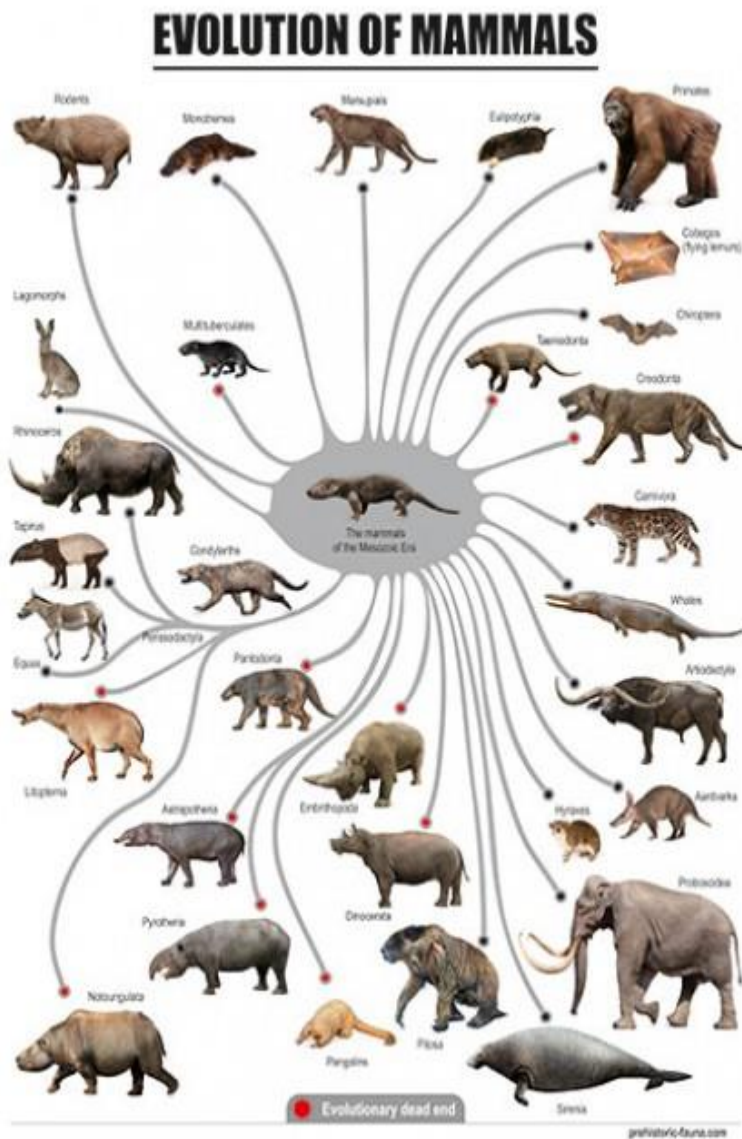
(a) Gradualism model

(b) Punctuated equilibrium model





# Rapid Evolution of Mammals



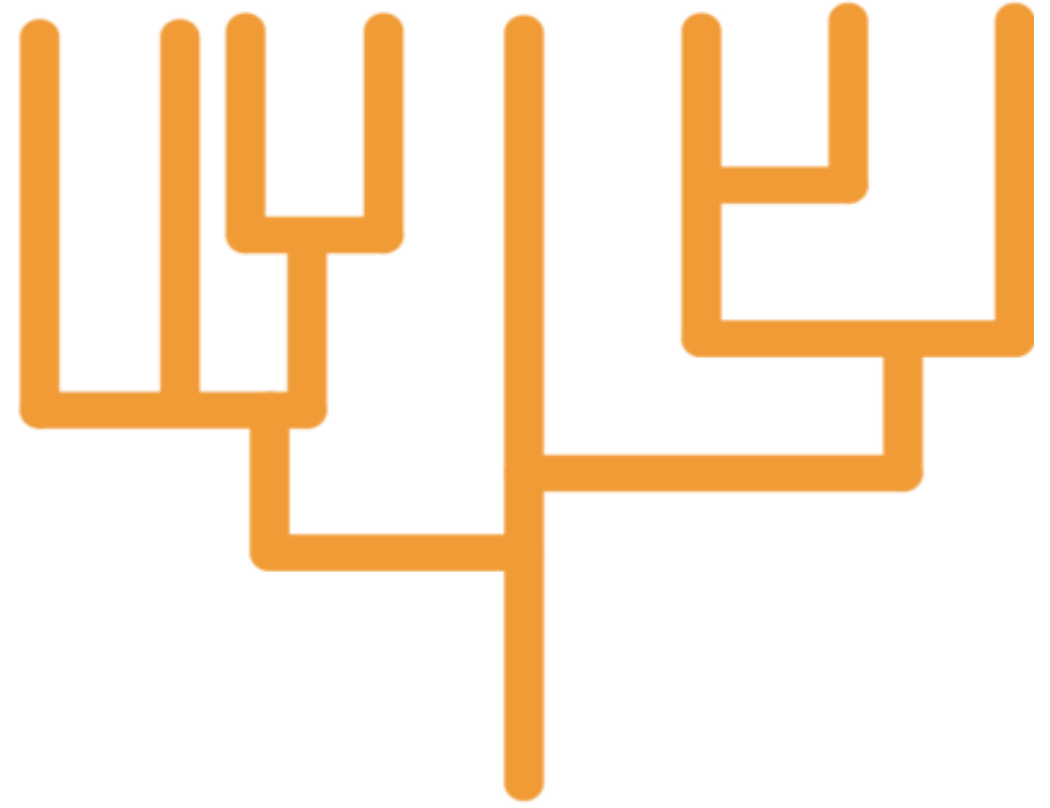


**BOTH GRADUALISM AND PUNCTUATED EQUILIBRIUM  
RATES OF EVOLUTION OCCUR DEPENDING ON CIRCUMSTANCES**

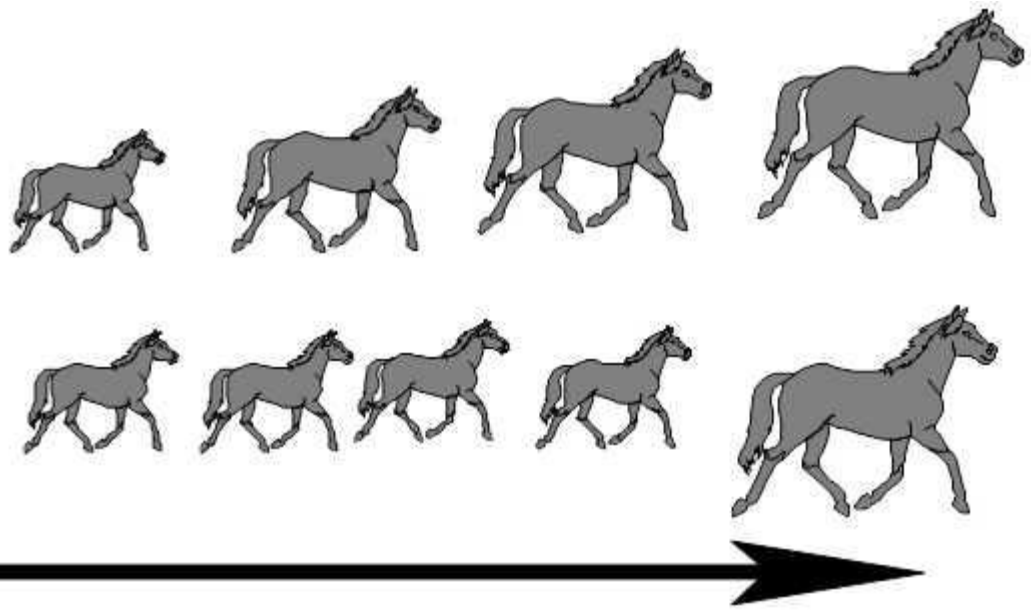
Phyletic Gradualism



Punctuated Equilibrium







time (5 million years)

# GRADUALISM Of Horses

# PUNCTUATED EQUILIBRIUM

