

The Diversity of Fishes

Fishes were the first creatures with brains and bony jaws. But their incredible diversity—fishes make up half of all vertebrate species alive today, and live everywhere from mountain streams to ocean depths—makes it easier to determine what's not a fish. This seminar explores this paradox by demonstrating how ichthyologists pursue the evidence through the study of evolution, diversity ecosystems, and biogeography.



Key Science Concepts:

- Fishes are the **most diverse** of all vertebrate groups.
- Fish have breathing, feeding, sensory, locomotion and reproductive structures that make them **specialized** for life in water.
- Many groups of fishes are among the **most endangered** vertebrates.
- **Collection-based research** provides crucial scientific underpinning for conservation policy and planning.
- **Cladistics** is a method of classifying living things by reconstructing their evolutionary relationships. It uses shared derived characteristics—features that evolve for the first time and are passed on to all an organisms' descendants—to establish relationships. Cladistics is the method used in modern systematics.
- **Systematics** is the branch of Biology that discovers and classifies the diversity of life, both living and extinct. When studying a group of organisms, a systematist typically looks for evidence (in the form of shared derived characteristics) that supports evolution from a common ancestor.
- In biological terms, **success** is based on different criteria, These include how diverse a group of organisms is (for example, there are 24,000 ray-finned fish species compared to about 820 species of sharks and rays), how long a species has lived on Earth, the development of specialized adaptations and how many individuals belong to a species.

Authoring Scientists:

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