Prioritising fish evolutionary history for conservation action

Given the limited resources available, it is necessary to prioritise spending of conservation funds and highlight particular species for conservation action. The EDGE metric is a popular approach that prioritises threatened species that have no or few close relatives on the tree of life for conservation using quantitative methods. While EDGE prioritisations now exist for all terrestrial vertebrates, sharks and rays, corals and gymnosperms, no such prioritisation exists for any group of ray-finned fish. The student will assess newly available phylogenetic and extinction risk data to determine which clades of ray-finned fish are currently best-suited to an EDGE prioritisation. The student can then apply cutting-edge techniques to generate a species-level phylogenetically informed conservation prioritisation, or EDGE List, for the target clade(s). This EDGE List would provide the first steps towards applied conservation efforts for Evolutionarily Distinct and Globally Endangered ray-finned fish by the Zoological Society of London's EDGE of Existence programme (www.edgeofexistence.org), with whom this project would be conducted.

Recommended reading:

Curnick, D. J. et al. Setting evolutionary-based conservation priorities for a phylogenetically data-poor taxonomic group (Scleractinia). Animal Conservation, 18, 303-312 (2015).

Faith, D. P. Threatened species and the potential loss of phylogenetic diversity: conservation scenarios based on estimated extinction probabilities and phylogenetic risk analysis. Conservation Biology, 22, 1461-1470 (2008).

Gumbs, R. et al. Tetrapods on the EDGE: Overcoming data limitations to identify phylogenetic conservation priorities. PLOS ONE, 13(4), e0194680 (2018).

Isaac, N. J. et al. Mammals on the EDGE: conservation priorities based on threat and phylogeny. PLOS ONE, *2*(3), e296 (2007).

Rabosky, D. L. et al. An inverse latitudinal gradient in speciation rate for marine fishes. Nature, 559, 392-395 (2018).

Steel, M. et al. Hedging Our Bets: The Expected Contribution of Species to Future Phylogenetic Diversity. Evolutionary Bioinformatics, 3, 237-244 (2007).