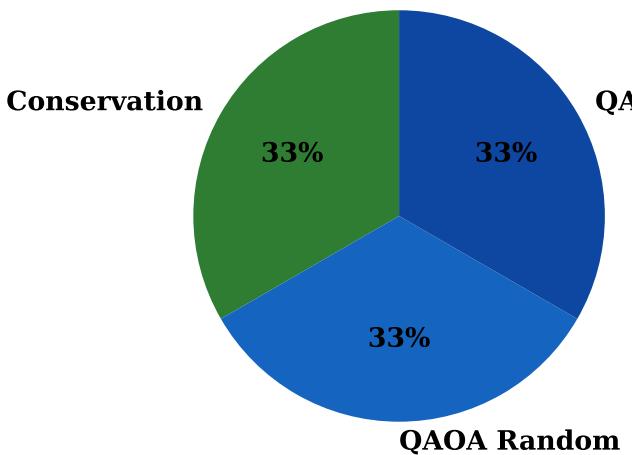
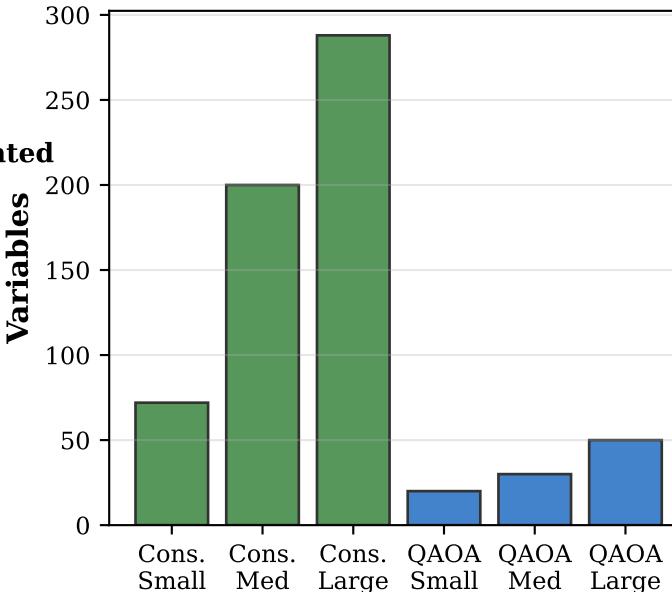


Instance Comparison Summary: Conservation vs QAOA Benchmarks

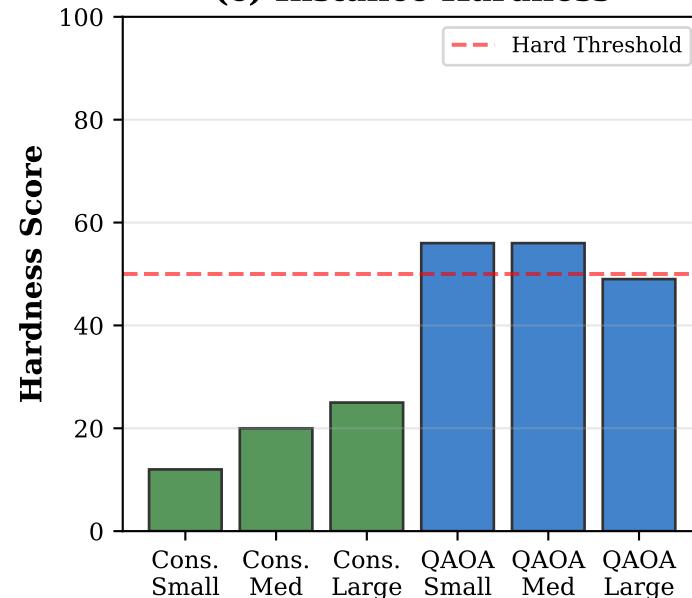
(a) Instance Type Distribution



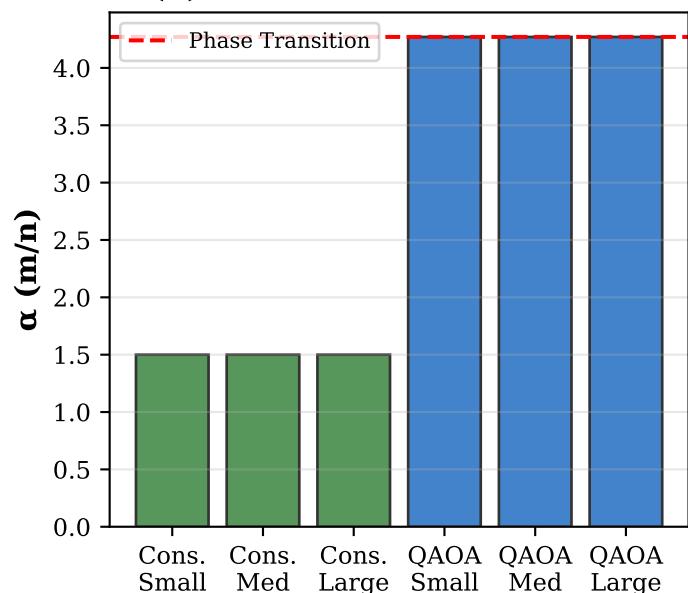
(b) Problem Size (Variables)



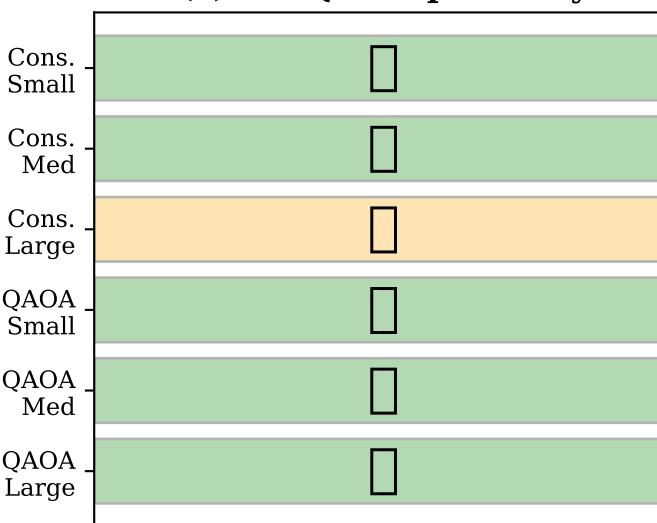
(c) Instance Hardness



(d) Clause-to-Variable Ratio



(e) NISQ Compatibility



KEY FINDINGS:

- Conservation instances: 36-144 sites \rightarrow 72-288 variables Structured, $\alpha \approx 1.5$
- QAOA benchmarks: 20-50 variables Random, $\alpha \approx 4.27$ (hard)
- Both types NISQ-compatible (50-300 qubit range)
- Comparable complexity after CNF encoding overhead
- Validated against real biodiversity data (GBIF, WDPA)