Researcher Profile: Dr. J. Phil Gibson  
Affiliation: School of Biological Sciences, University of Oklahoma

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| Category | Content |
| Research Domains | - Evolutionary Biology- Evolutionary Ecology- Conservation Biology- Botany- Phylogenetics- Life Science- STEM Education- Seed Ecology- Soil Microbiology- Cognitive Psychology |
| Techniques Used | - Statistical Analysis (ANOVA, Tukey’s HSD, Cox Proportional Hazards Model, Kaplan-Meier, ANCOVA, Mixed-Effects Models)- Bayesian Linear Mixed Models with Markov Chain Monte Carlo Parameter Estimation- Seed Stratification- Leaf Chemistry Analysis (Total Nitrogen and Nitrogen Isotopes)- Reliability Testing (KR-20, Split-half reliability)- Exploratory Factor Analysis (EFA)- Predispersal Achene Mortality- Postdispersal Achene Mortality- Phylogenetic Tree Diagrams- Germination Trials- Seed Viability Assessment- Soil Volumetric Water Content (SVWC) |
| Data & Platforms | - Mainly Self-Collected Datasets- Platforms: R with multcomp package, University of Oklahoma Kessler Atmospheric and Ecological Research Station (KAEFS), Life DiscoveryEd Digital Library, HHMI BioInteractive Data Points, QUBESHub |
| Application Areas | - Ecological and Evolutionary Research- Conservation and Management of Rare Species- Curriculum Development in STEM Education- Riparian Ecosystem Restoration- Data Science Training |

Key Research Thinking Patterns

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| Aspect | Detail |
| Comparative Analysis | Compares different groups, conditions, or strategies to identify the similarities and differences, and the underlying causes or effects (e.g., Germination between non-stratified and stratified). |
| Multi-Factor Approach | Considers multiple interacting variables or factors simultaneously to understand and track a complex phenomenon, rather than isolating the individual effects (e.g., Heterocarpy Evolution was investigated and tracked). |
| Addressing Misconceptions | Identifies common misunderstandings or incorrect interpretations of scientific concepts and designs methods or tools to specifically correct the misconceptions (e.g., misconception of interpreting phylogenetic trees). |
| Collaboration-based | Works together across institutions to achieve shared research or educational goals (e.g., Basic Evolutionary Tree-Thinking Skills Instrument tool development by BioQUEST, Michigan State University, etc). |

Knowledge Graph Sketch (Hierarchical View)

TBD

Summary Description (for use as a KG node or metadata tag)

J. Phil Gibson is a distinguished researcher in evolutionary biology, plant ecology, and science education. His work focuses on plant reproductive strategies and improving scientific literacy. Gibson's research bridges theoretical concepts like bet-hedging and phylogenetic thinking with empirical studies on plant-insect interactions and conservation. He employs rigorous methods, including field experiments, modeling, and advanced statistics, to derive data-driven insights into plant evolution and foster critical thinking in STEM students.