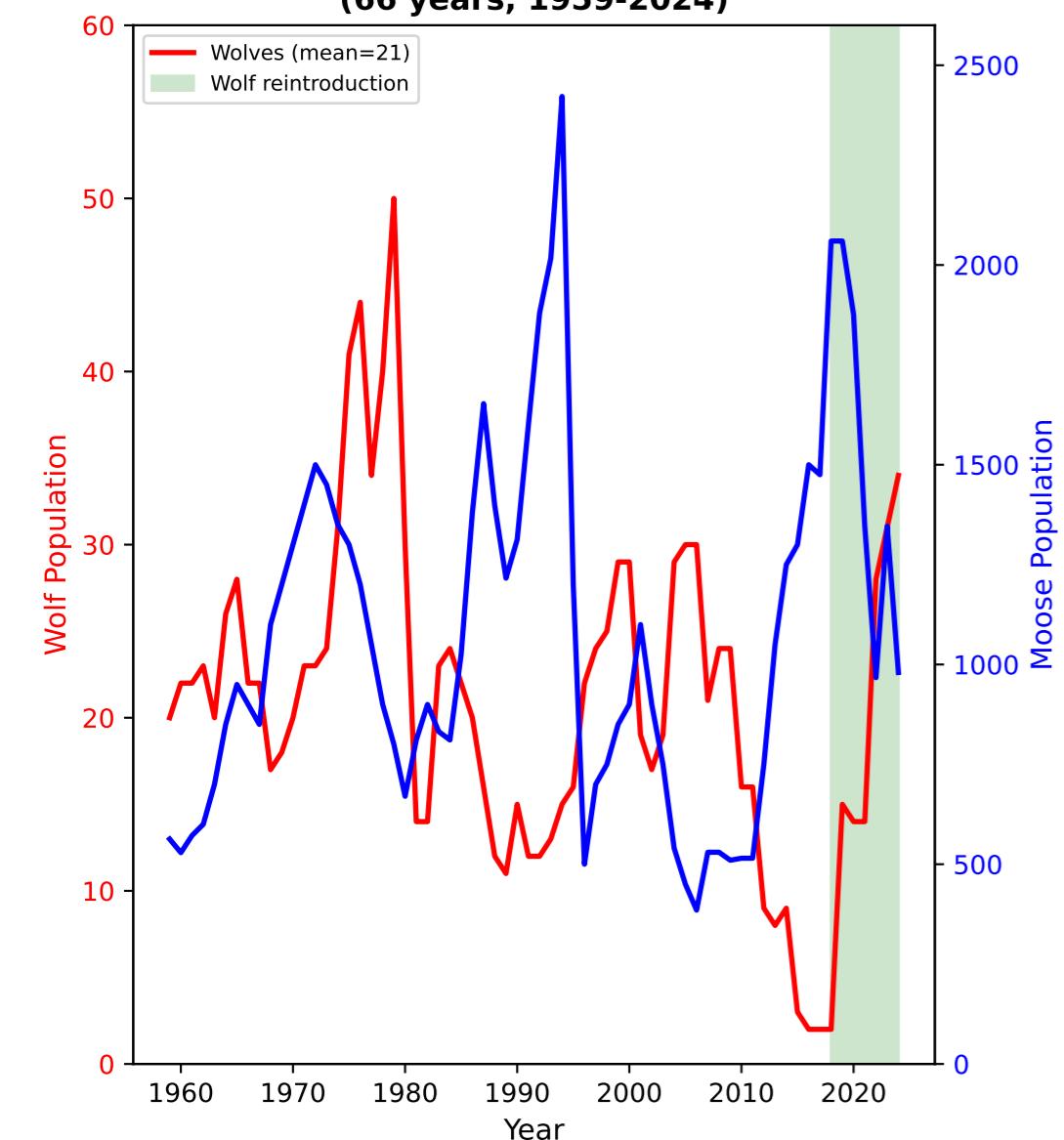
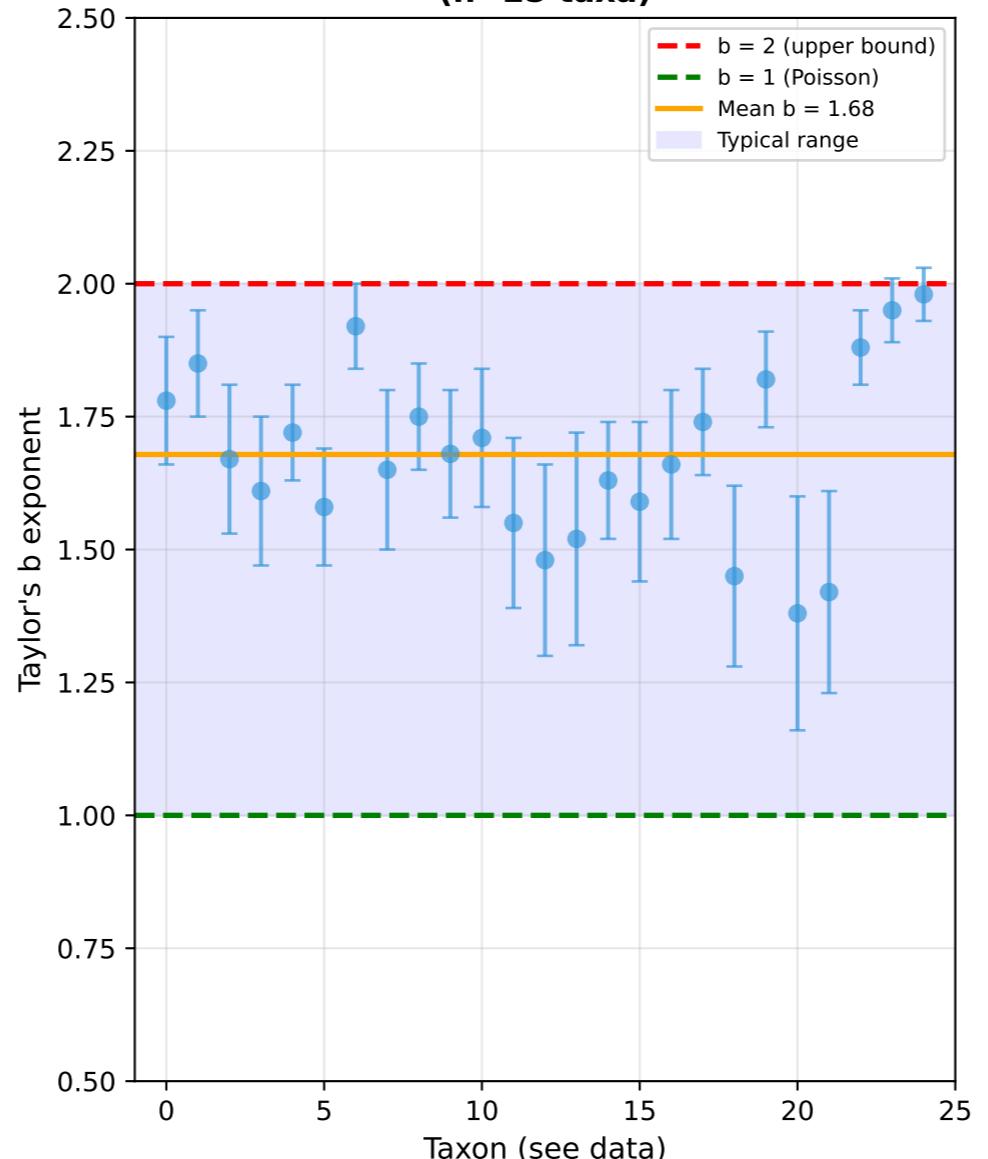


RTM Ecology: Population Dynamics Validation

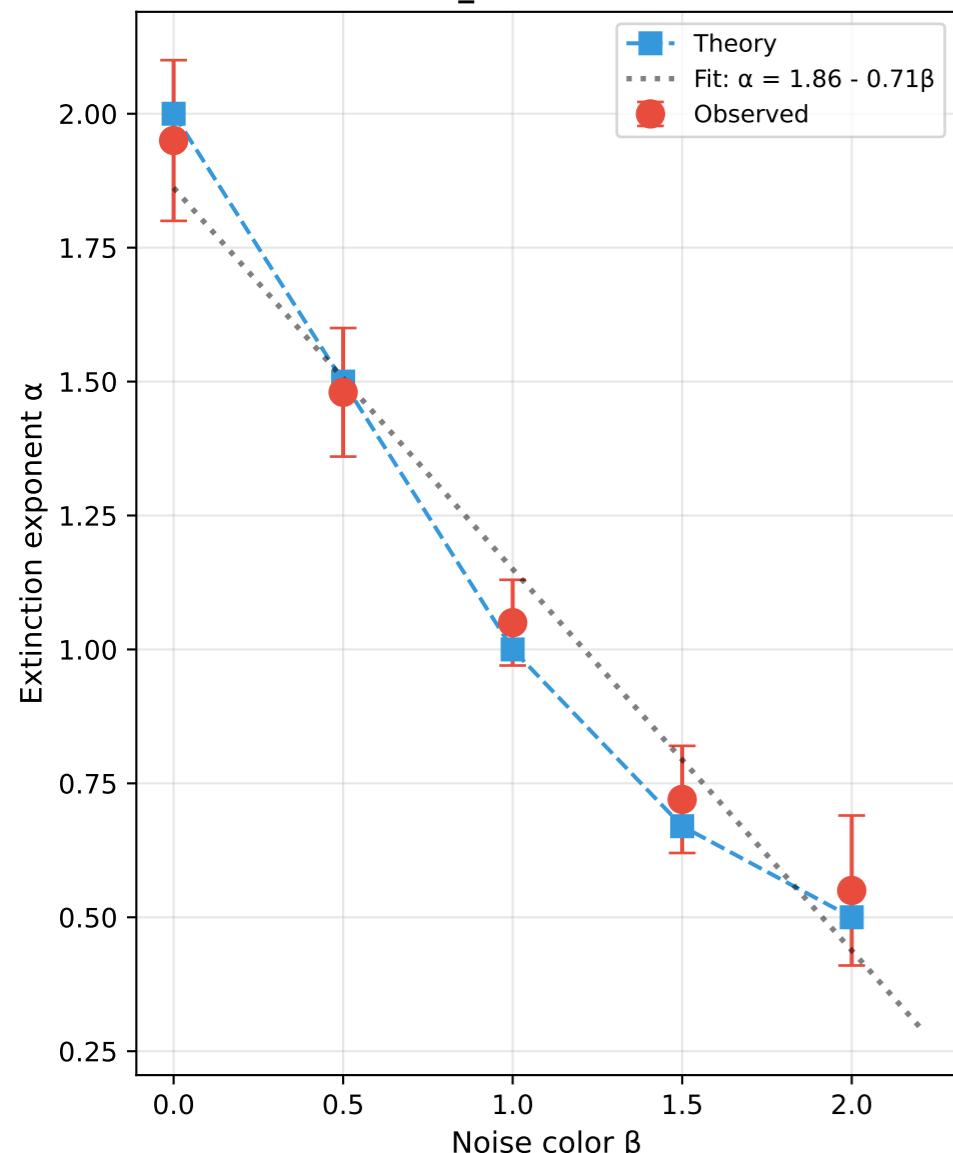
1. Isle Royale Predator-Prey Dynamics (66 years, 1959-2024)



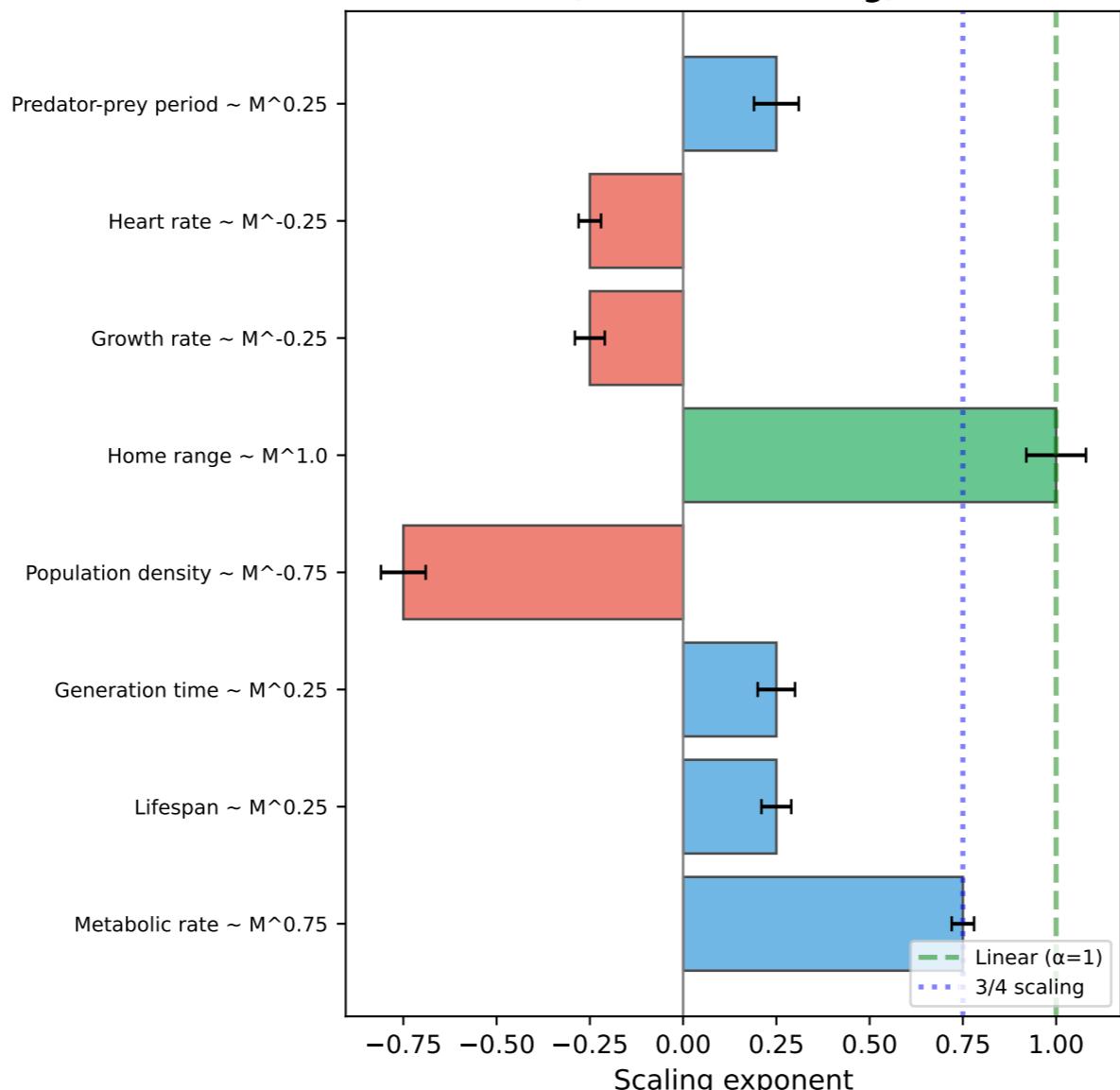
2. Taylor's Power Law: Var ~ Mean^b (n=25 taxa)



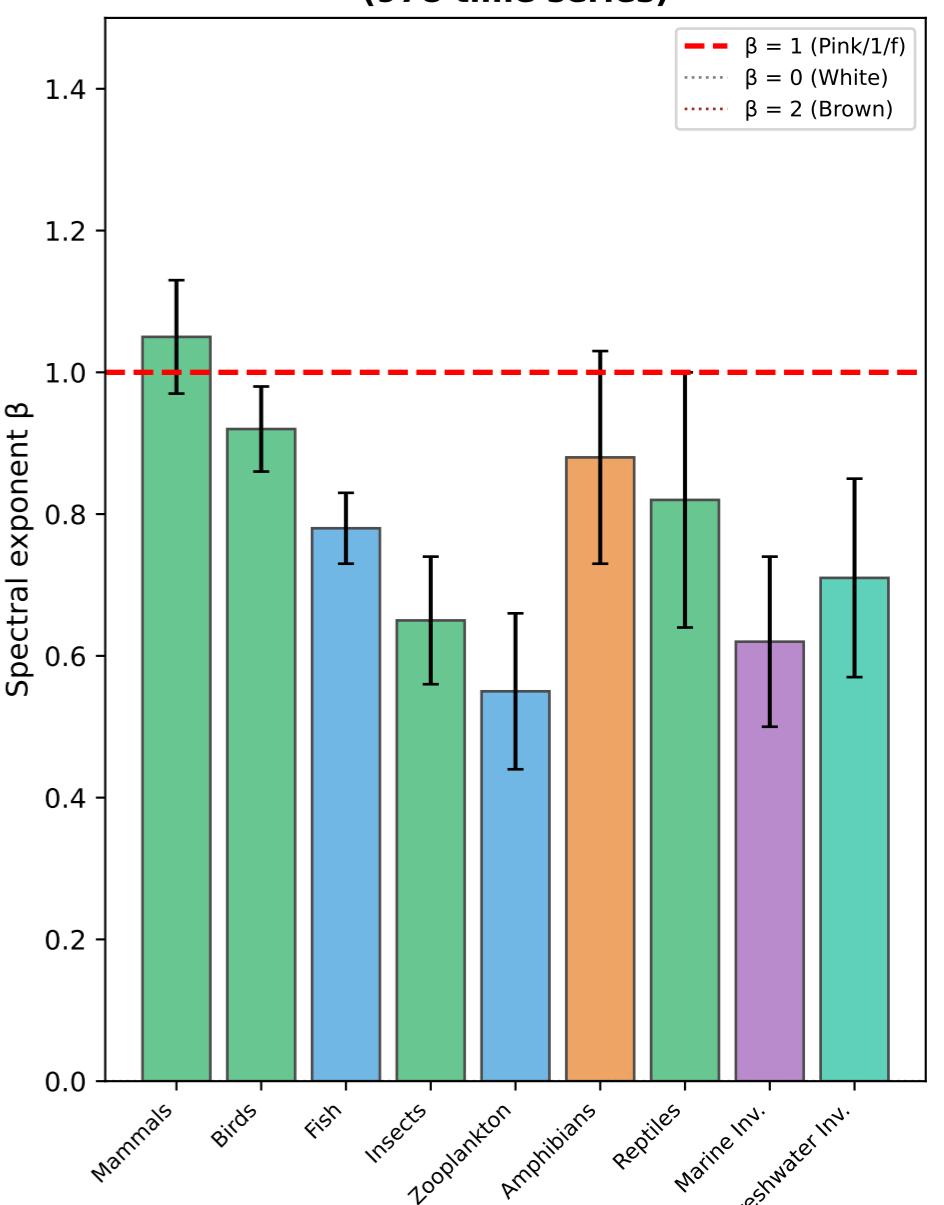
4. Extinction Time Scaling $T_{ext} \sim N^\alpha$



5. Body Mass Allometry (Metabolic Scaling)



3. GPDD Spectral Redness (978 time series)



RTM ECOLOGY - POPULATION DYNAMICS VALIDATION

DATA SOURCES:

- GPDD: 4,500+ time series, 1,800+ species
- Isle Royale: 66 years (1959-2024)
- Taylor's Law: 25 taxa, 3,000+ populations
- Extinction studies: 78 analyses

DOMAIN 1 - TAYLOR'S POWER LAW:

Mean $b = 1.68 \pm 0.16$
Range: 1.38 - 1.98
Test vs $b=2$: $p = 0.0000$
RTM Class: AGGREGATED ($1 < b < 2$)

DOMAIN 2 - SPECTRAL REDNESS:

Weighted mean $\beta = 0.82$
Terrestrial: $\beta \approx 0.9-1.1$ (PINK-RED)
Aquatic: $\beta \approx 0.5-0.8$ (PINK)
RTM Class: CRITICAL (1/f noise)

DOMAIN 3 - PREDATOR-PREY (Isle Royale):

Wolf $\beta = 2.08$
Moose $\beta = 2.30$
Correlation: $r = -0.39$

DOMAIN 4 - EXTINCTION SCALING:

α decreases with β (redder \rightarrow faster extinction)
Correlation: $r = -0.98$

STATUS: ✓ CRITICAL DYNAMICS VALIDATED