

Information Needs



Northern Spotted Owl
5 Year Review

What We Know

- Taxonomy
- Genetics
- Natural History
- Habitat Use Patterns
- Life-history parameters
 - Patterns of variation
 - Links with habitat quality
- Population Trends
 - Temporal & spatial variation



How We Got There

- Cooperation
 - Development of better field methods
 - Emphasis on consistency across studies
- Infusion of better statistical methodologies
 - Recent advances in mark-recapture
 - Information-theoretic approach
 - Joint analysis of data
 - Better estimators of population rates of change
 - Refinement of random effects modeling approaches
 - Refinement of variance components approaches
- Avoidance of poor scientific practices
 - Indices
 - Surrogates for population parameters
 - e.g., measured survival rather than return rates

What We Need to Know

- Mechanistic Explanations (“Why” questions)
 - Relation of habitat to population performance
 - Fitness
 - Already examined in several existing studies
 - Identify roles of critical resources
 - Identify factors constraining use of critical resources

What We Need to Know

- Effects of Potential Threats
 - Barred Owls
 - West Nile Virus
 - Timber Harvest
 - Catastrophic wildfire
- How Threats affect Population Dynamics
 - Why are they threats?

Genetics

- Levels of genetic diversity in isolated populations
 - e.g., Marin County, Olympic National Park
- What is the degree of introgression between Northern and California Spotted Owls?
- Is the Columbia River a barrier to gene flow?



Prey Dynamics



- Prey Abundance & Habitat
 - Limiting factors
 - Movements
- Availability to Spotted Owls
 - What is the trade-off between prey abundance and availability in different vegetation types and seral stages?
- Effects on Spotted Owls
 - How do spatial and temporal changes in prey populations affect spotted owl population dynamics

Habitat Associations

- Better Understanding of What is Spotted Owl Habitat
 - Why are there differences in provinces?
 - How do these differences relate to prey?
 - Are there unifying characteristics of spotted owl habitat across the range?
- Responses of Spotted Owls to Habitat Changes
 - Fragmentation & heterogeneity
 - Compatibility with different silvicultural prescriptions
 - How did past natural disturbance regimes shape spotted owl habitat?



Barred Owls



- Need better understanding of
 - Natural history
 - Invasion patterns
 - Population trends
- How do they compete with spotted owls?
 - What is the mechanism and magnitude of competition?
 - Removal experiment to test alternative hypotheses
 - Barred owls are causing spotted owl declines
 - Some other factor is causing spotted owl declines and barred owls are replacing spotted owls

Predation

- How extensive is predation?
- What role do changes in habitat have on increased predation risk?

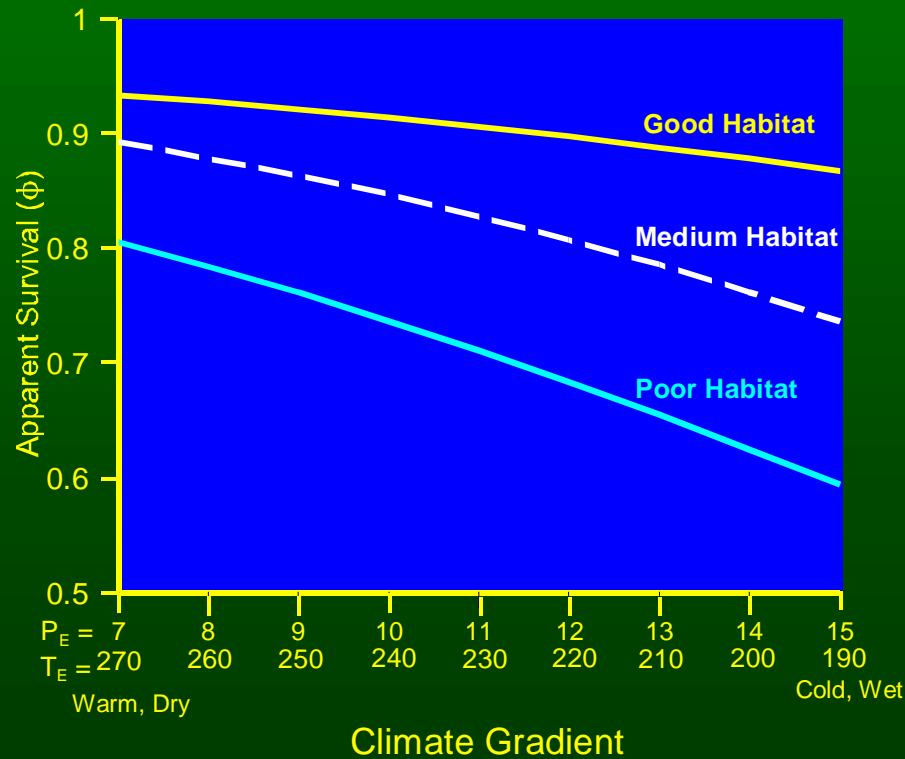


Population Dynamics

- Continuation of long-term studies
 - Emphasize processes rather than just trends
 - Refinements of design to increase efficiency
- Understanding determinants and limiting factors
 - Habitat, prey, predators, competition, weather
- How is population structured?
 - Across different scales
 - What is the role of dispersal in structuring populations?

Interactions

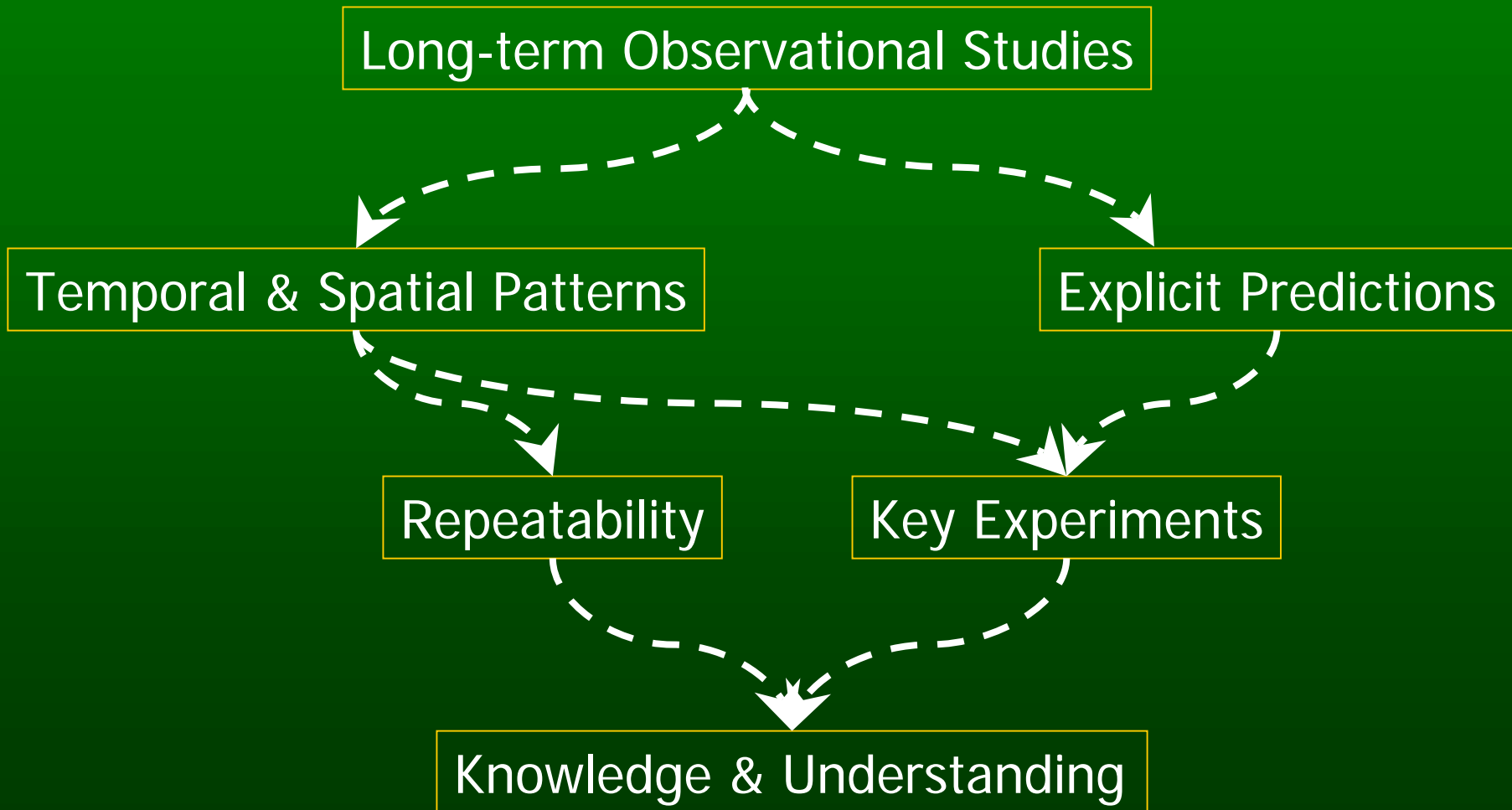
- How do competing factors interact?



Basic Information Needs

- GIS Vegetation Coverages
 - Accurate
 - Consistent Range-wide
 - Appropriate for different ecological provinces
- Tracking Annual Vegetation Changes
 - By type (timber harvest, fire, etc.)
 - By amount
 - Spatially explicit

Research Programs



Conclusions

- Need to better understand how the system works
 - Mechanisms and processes linking habitat, prey, weather, competitors with population dynamics
- Need to implement and evaluate forest management practices that emulate natural disturbance regimes

Conclusions

- Funding needs to go beyond just monitoring
 - Need to develop research programs built around current demographic studies
 - Incorporate studies that address mechanisms behind threats
 - Need to develop key experiments to examine compatibility of forest management with maintenance of spotted owl populations

Conclusions

- Stay out of court
 - Expensive and time consuming
 - “Either pay the lawyers and learn nothing or pay the biologists and learn something” – G White
- Be Proactive rather than Reactive
 - Requires communication between different agencies and interest groups