



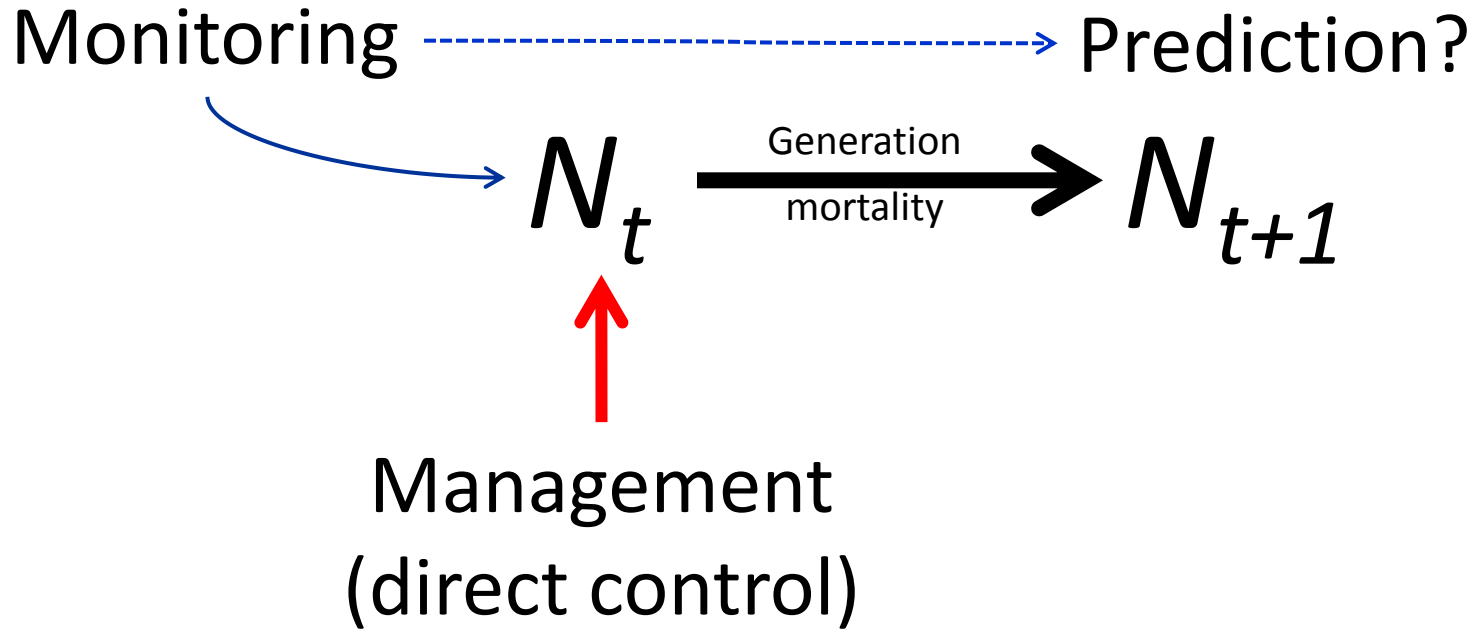
Consideration of temporal and spatial scales in bark beetle management

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Population dynamics vs monitoring/management



Knowledge $\neq$ Prediction $\neq$ Monitoring/management

Cross-scale drivers of population dynamics: management considerations

Tree

Temporal

- Population phase
- Attack rate/timing
- Tree defense rate

Spatial

- Phloem quantity/quality
- Competition, predation
- Host experience

Stand

Temporal

- Infestation phase
- Host depletion
- Attack rate/timing

Spatial

- Distribution/abundance of large trees
- Distribution/abundance of infested trees

Forest

Temporal

- Outbreak phase
- Attack rate/timing

Spatial

- Distribution/abundance/connectivity of susceptible stands
- Distribution/abundance/connectivity of infested stands

Landscape

Temporal

- Synoptic climate patterns
- Climate change

Spatial

- Synoptic climate patterns
- Climate change