

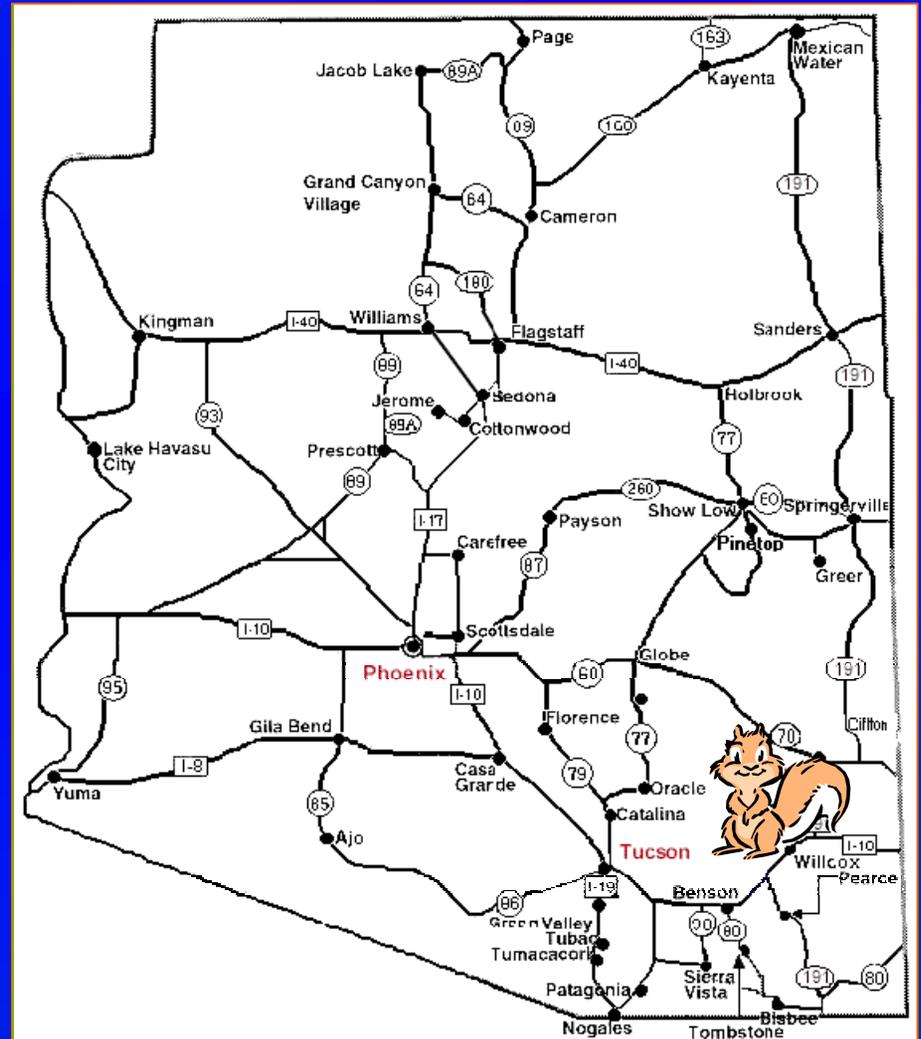
**Rapid Prototyping Workshop:
Case study of the endangered
Mt. Graham red squirrel
(*Tamiasciurus hudsonicus
grahamensis*)**



Mount Graham Red Squirrel

Tamiasciurus hudsonicus grahamensis

- Listed as
endangered
in 1987





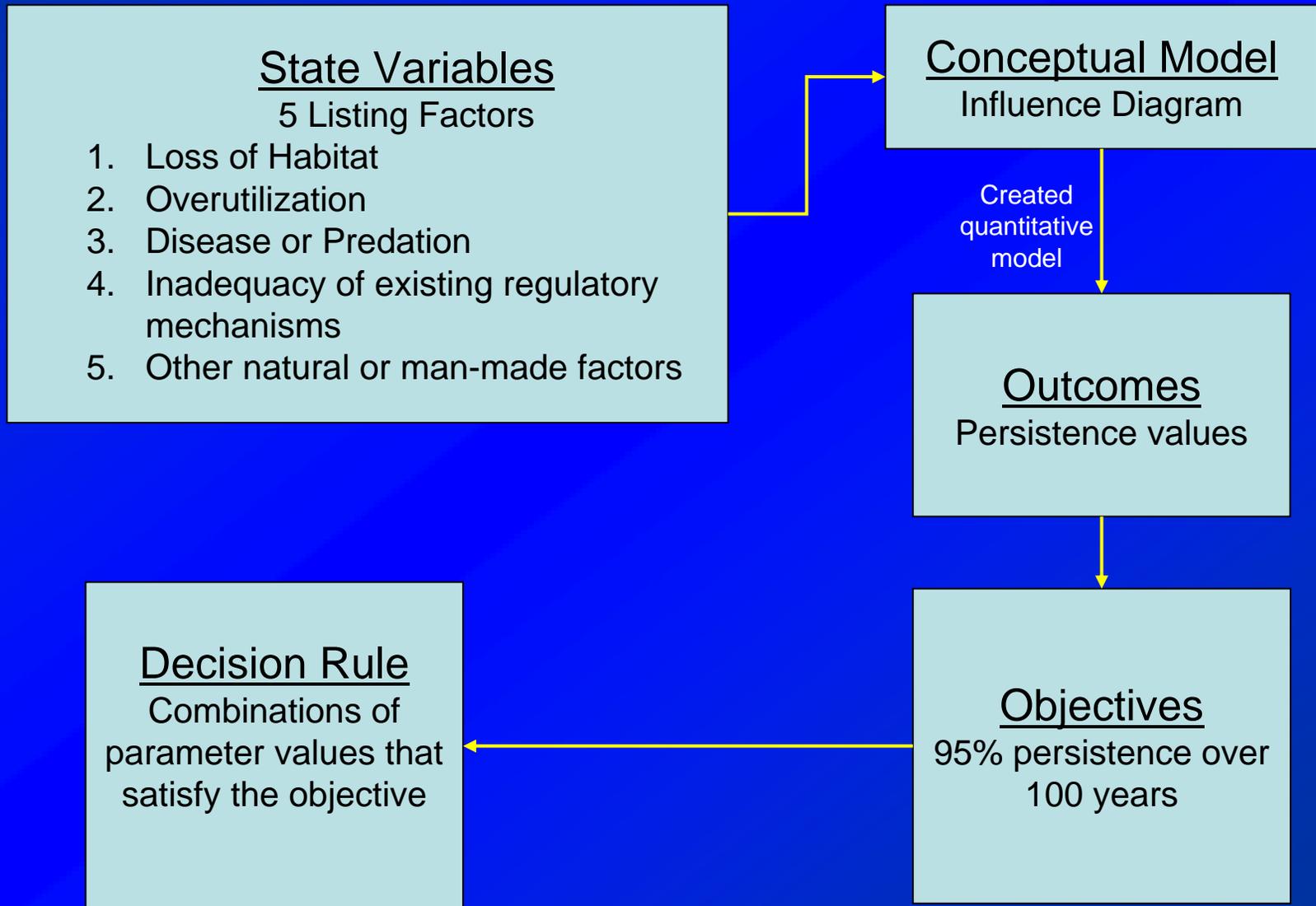
History

- 1) Original MGRS recovery plan finalized in 1993.
- 2) ESA requires USFWS to revisit recovery plans every 5 years
 - approaching 15 years with no revision
- 3) Major changes to MGRS habitat (fire and insect outbreaks)
- 4) Revisions to the MGRS recovery plan languishing due to inability to derive and agree upon recovery criteria

Problem Statement

- Original: Define or develop a transparent decision-making process by which the FWS and Recovery Team can derive defensible recovery criteria for the Mt. Graham red squirrel
- Ultimate: Develop defensible recovery criteria specific to the Mt. Graham red squirrel

Objective: Define recovery criteria



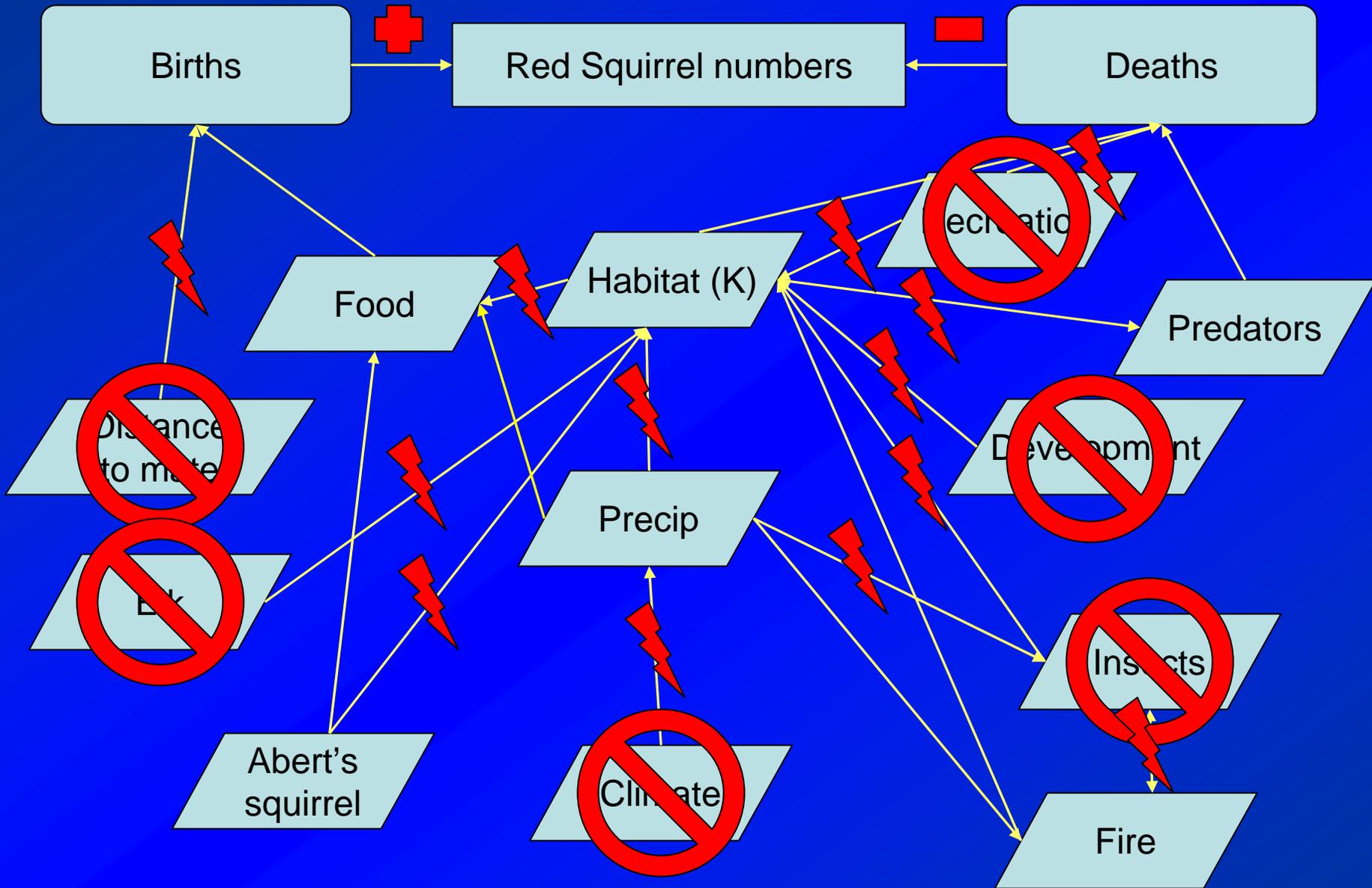
5 Listing Factors

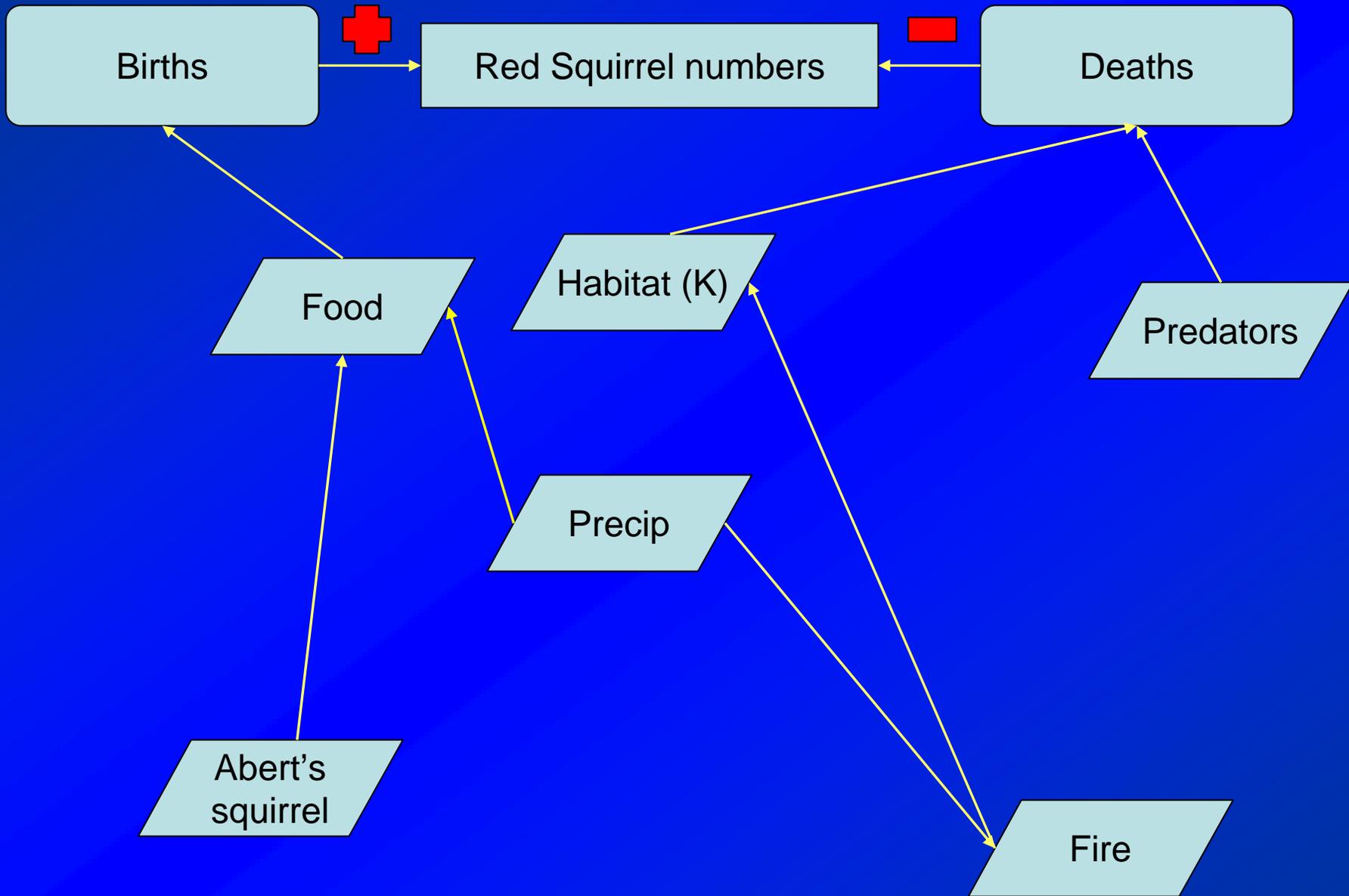
1. Loss of habitat
2. Overutilization
3. Disease or predation
4. Inadequacy of existing regulatory mechanisms
5. Other natural or manmade factors

5 Listing Factors

1. Loss of habitat (fire, insects, weather)
2. Overutilization (nothing imminent)
3. Disease (none) or predation (avian)
4. Inadequacy of existing regulatory mechanisms (adequate)
5. Other natural or manmade factors (introduced Abert's squirrel, elk)

No immigration or emigration





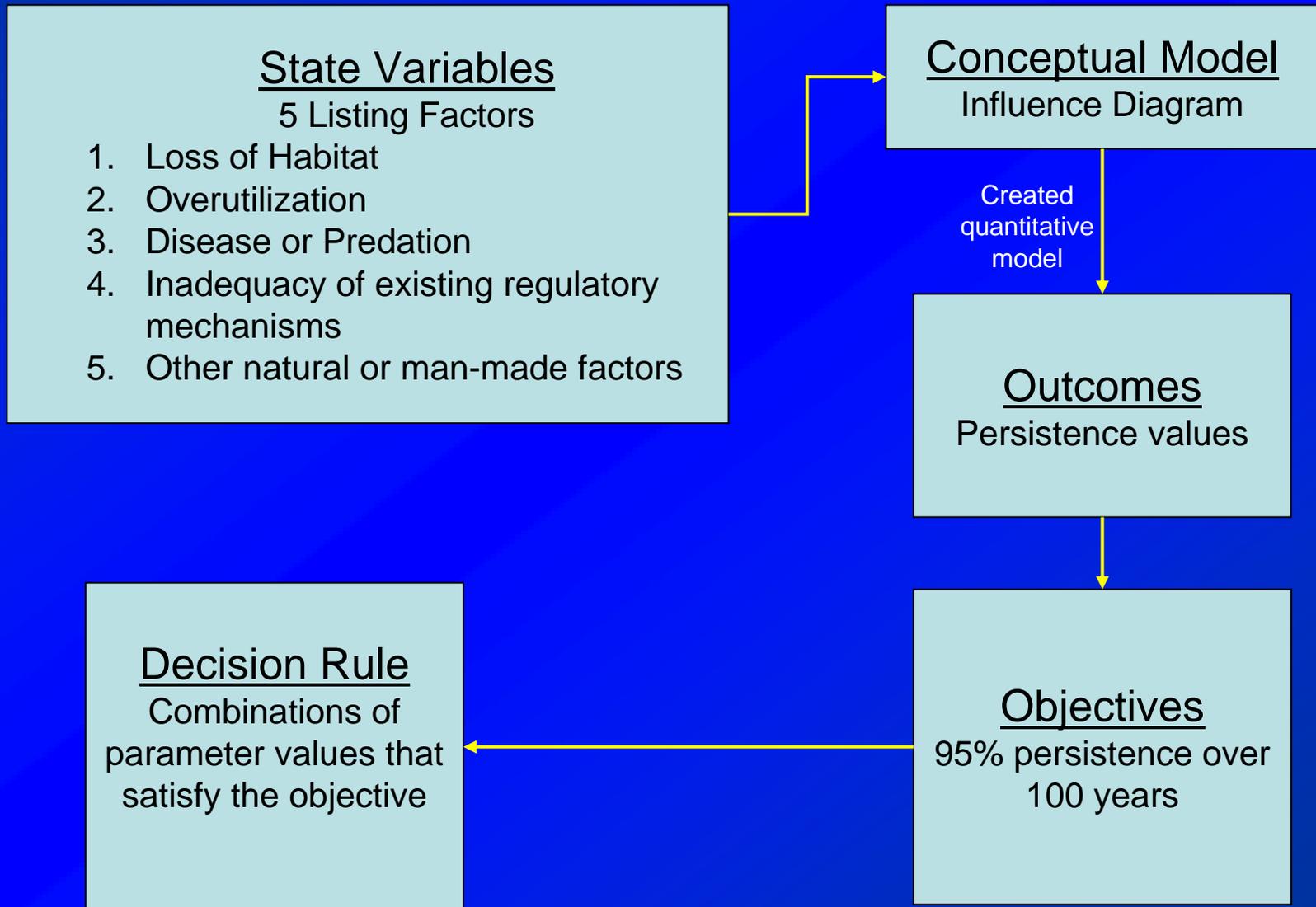
System Model

- Predictive
 - Quantitative
 - Stochastic
- Simulates population dynamics of red squirrel based on the listing factors
 - amount of habitat, competition with Abert's squirrels

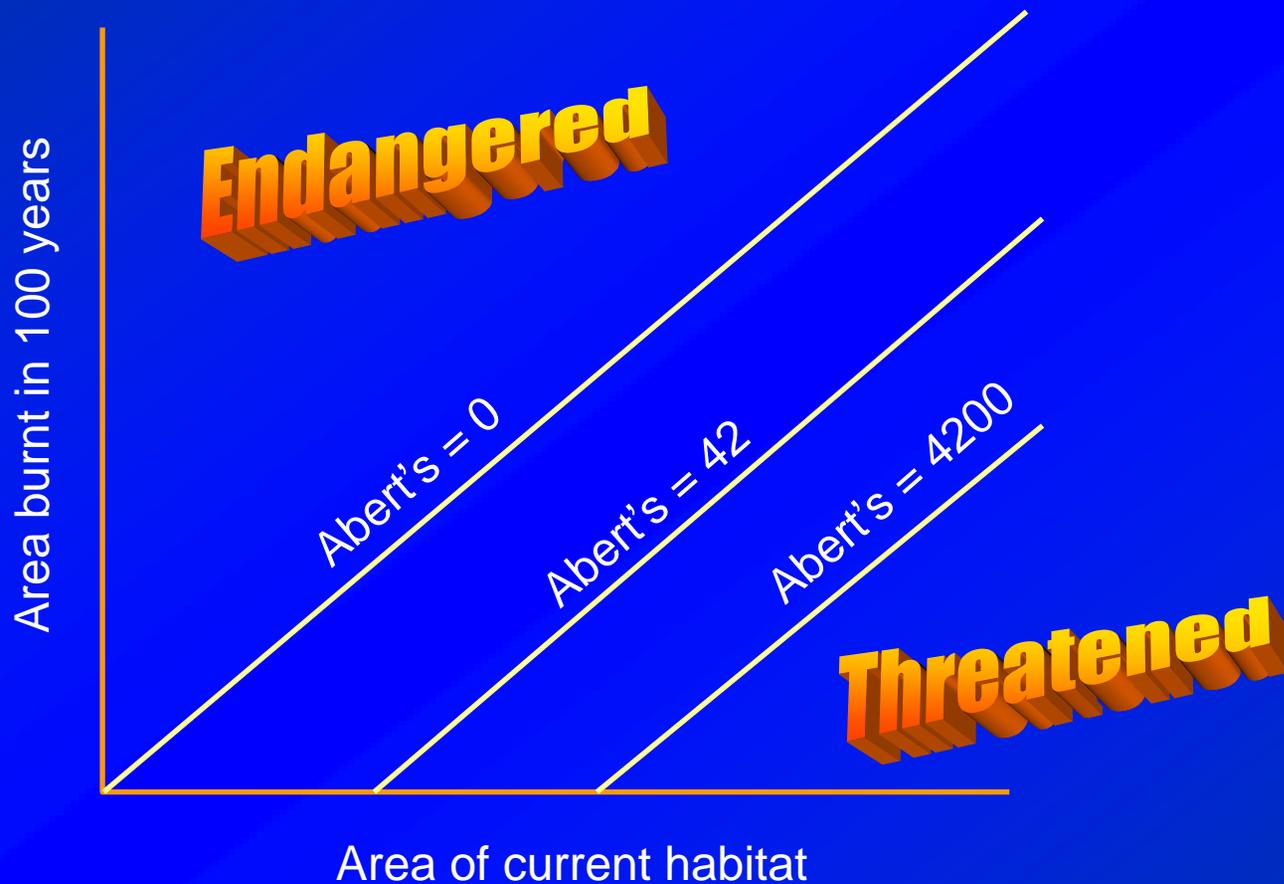
Show me the model!



Objective: Define recovery criteria



Combination of parameter values



Uncertainty

- How did we address?
 - Stochastic model
 - Sensitivity analysis to test importance of factor
 - Range of known data
 - Estimate range of unknown data

Next Steps

- **P**roblem: What type of meeting needed to sell the SDM process internally
- **O**bjective: Build support for SDM process in terms of developing MGRS recovery criteria
- **A**lternatives:
 - Who to include at meeting? Decision-makers? Influential folks but not decision-makers?
 - All agencies at one meeting, or each agency individually?
 - How long a meeting?

Next Steps (cont.)

- Consequences and Tradeoffs:
 - Right people, wrong amount of time
 - Wrong people, right amount of time
 - Wrong people, wrong amount of time
 - Right people, right amount of time

Questions?

