

# Population-level ERA... Really?

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# Goals

- Present some challenges with population-level ERA.
- Generate some discussion on how practitioners are handling this.



# What are we trying to protect?

- *Listed Species* – individuals are protected
- *Common Species* – “the goal is not to protect each individual from any toxic effect, but rather to protect enough individuals so that a viable population... can be maintained” BC Tier 1 EcoRA Guidance

# Typical ERA

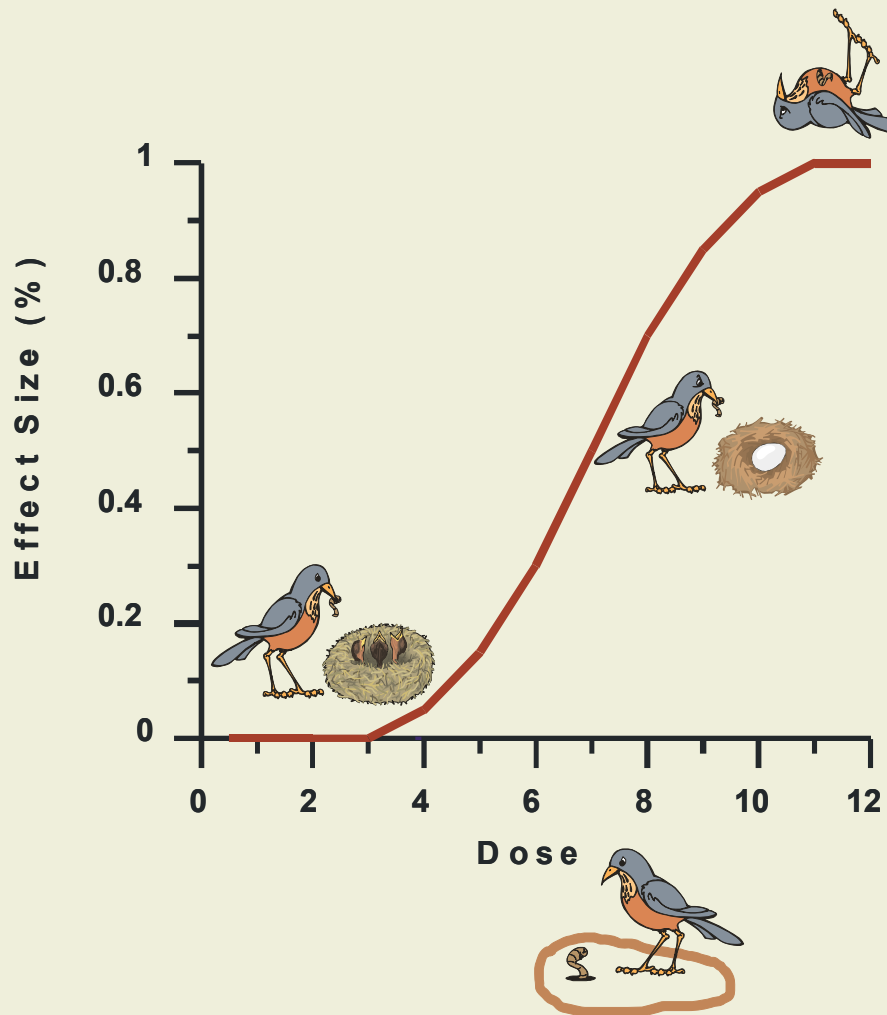
- Develop TRV (e.g.,  $ED_{20}$ ) based on effects at the organismal level (e.g., growth, reproduction)
- Estimate exposure to the group of individuals at your site
- Compare exposure to TRV

*Assumption* – Estimated exposures less than TRV will not adversely affect the “population”

# What is a population?

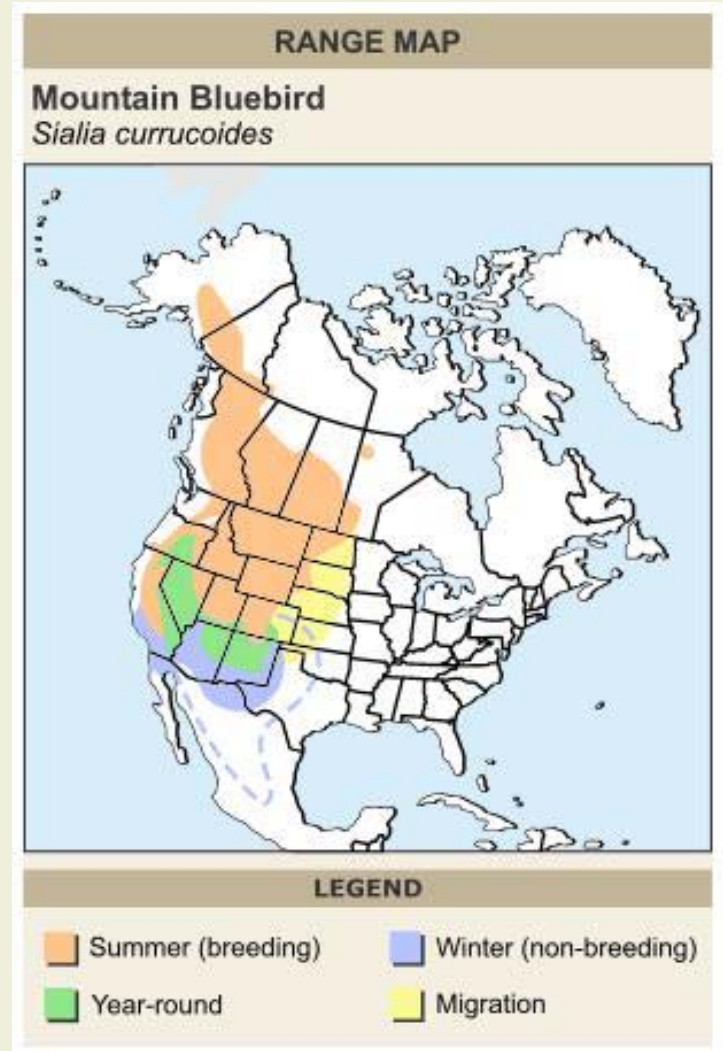
- Range of definitions:
  - group of individuals at your site
  - group of conspecifics that breed more with each other than with other groups
- Sometimes it's easy:
  - fish in lakes, small mammals on an island, or species with limited distribution
- Many times it's not!

# What if exposure $>$ TRV?

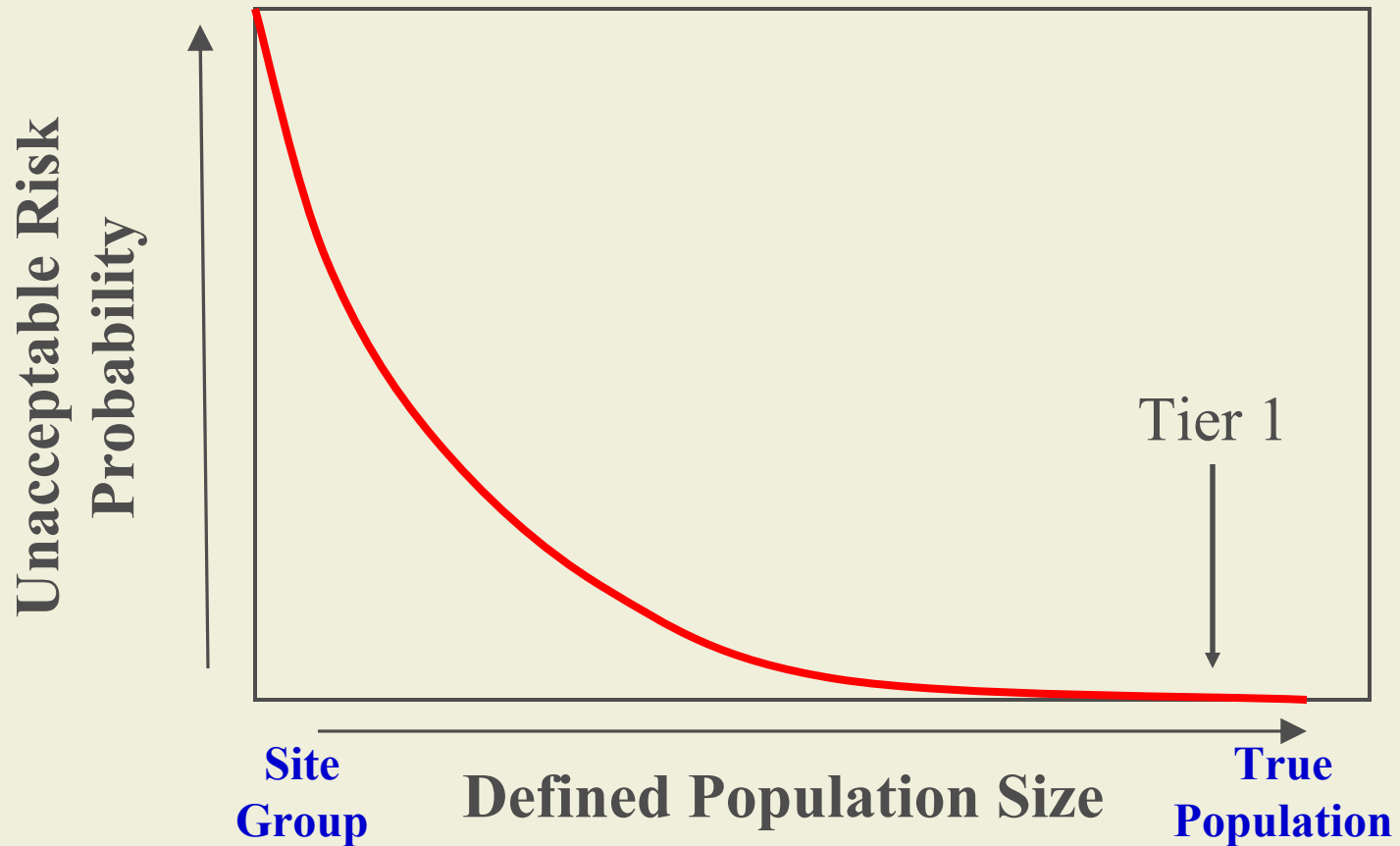


# True Population-level Effects Rare

- 4 breeding pairs on site
- Population range over western Canada and USA
- Site could be black hole with no pop-level effects!
- Is this really acceptable?



# Population Playing Field





# Risk Assessment Options

- Problem Formulation
  - Good interaction with Risk Managers and other stakeholders
  - Clear Assessment Endpoints
- Risk Assessment
  - Ecological assessment to test predictions
  - Understand incremental effects from site relative to other stressors (easier for harvested species) – ROC dependent
  - If no clear direction from Risk Managers, present risks for range of scales (e.g., local group, local population, regional population etc.)