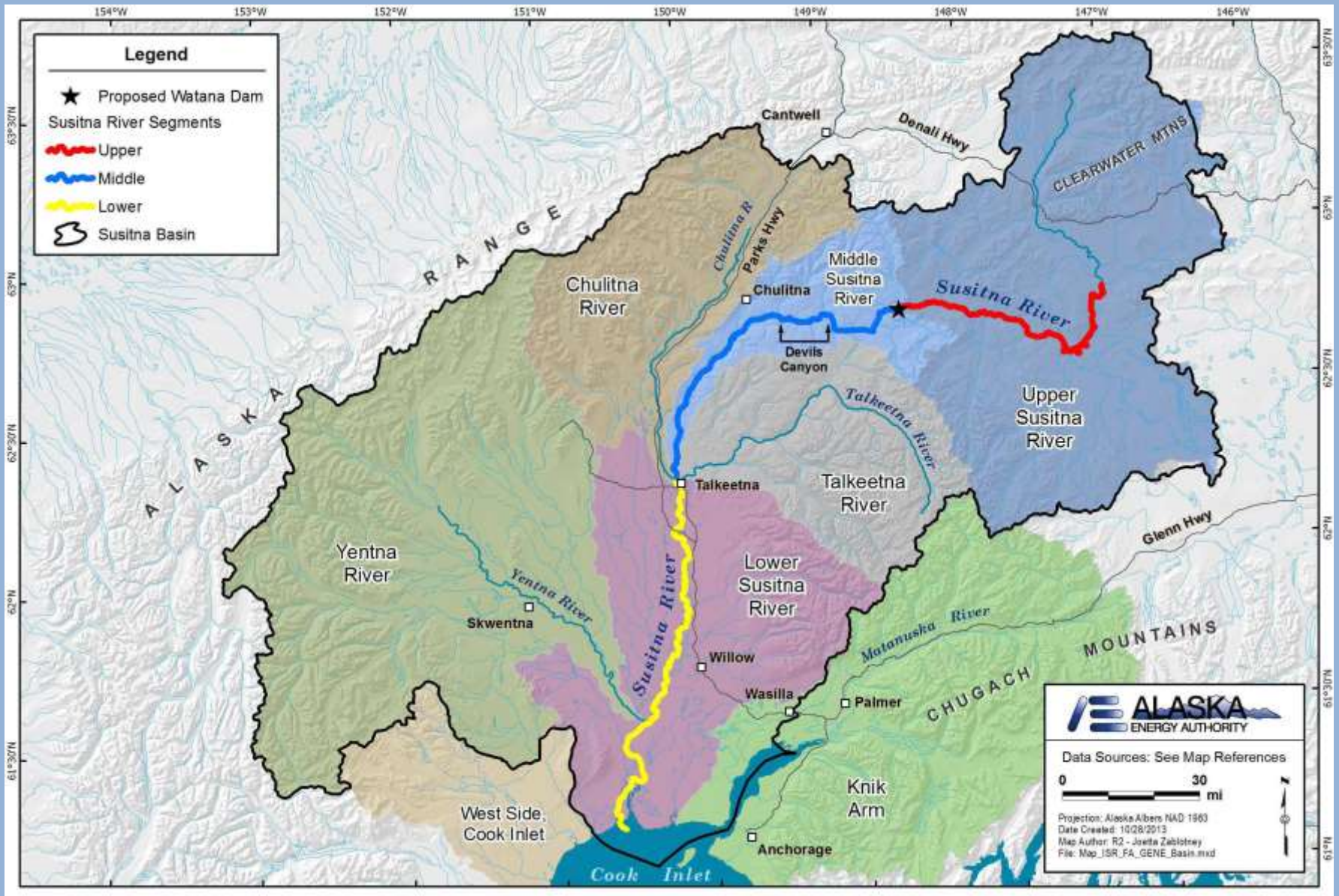


Ecological Risk Assessment for the Susitna River



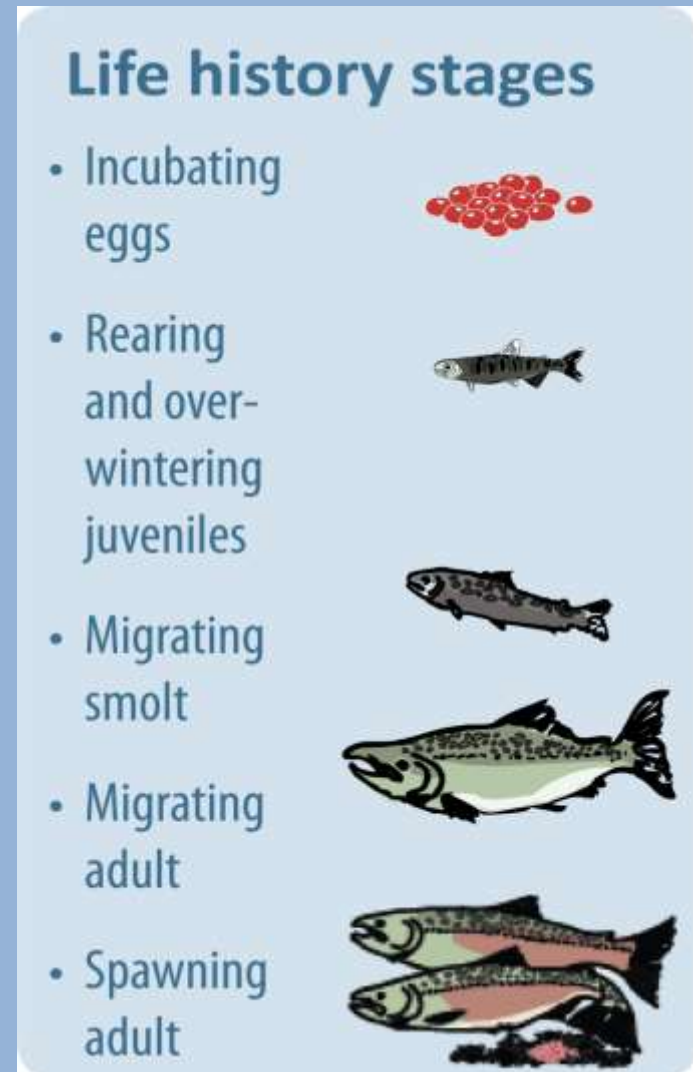
Corinne Smith
The Nature Conservancy
November 2014



Source: <http://www.susitna-watanahydro.org>

★ The Salmon ★

- Large diverse watershed with all 5 species of Pacific salmon
- Salmon drive ecological, cultural and economic vitality of the region



Phase 1

Problem Formulation

Potential Risk Factor/
Stressor

Salmon Habitat Attributes

Salmon Species & Life History



Phase 2

Analysis

Characterization of Exposure

Characterization of Ecological Effects



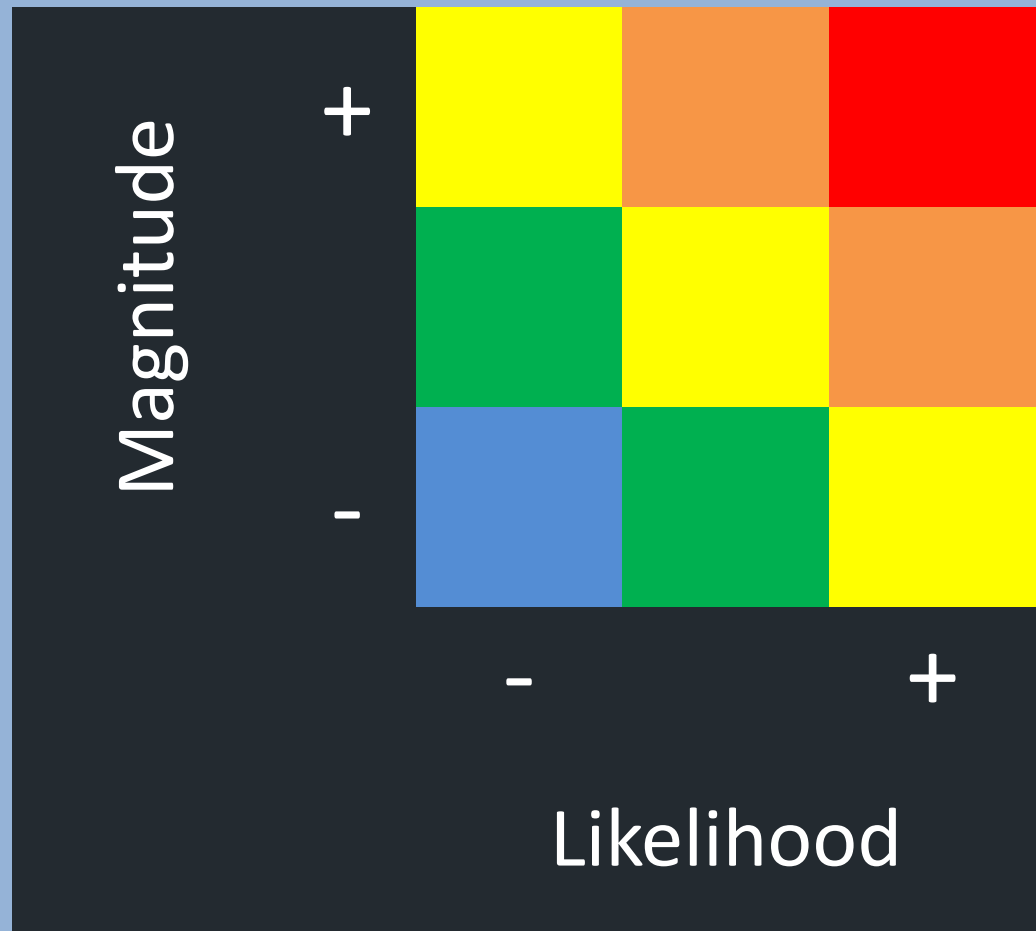
Risk Characterization

Population Parameters: Abundance
Productivity
Spatial structure
Diversity

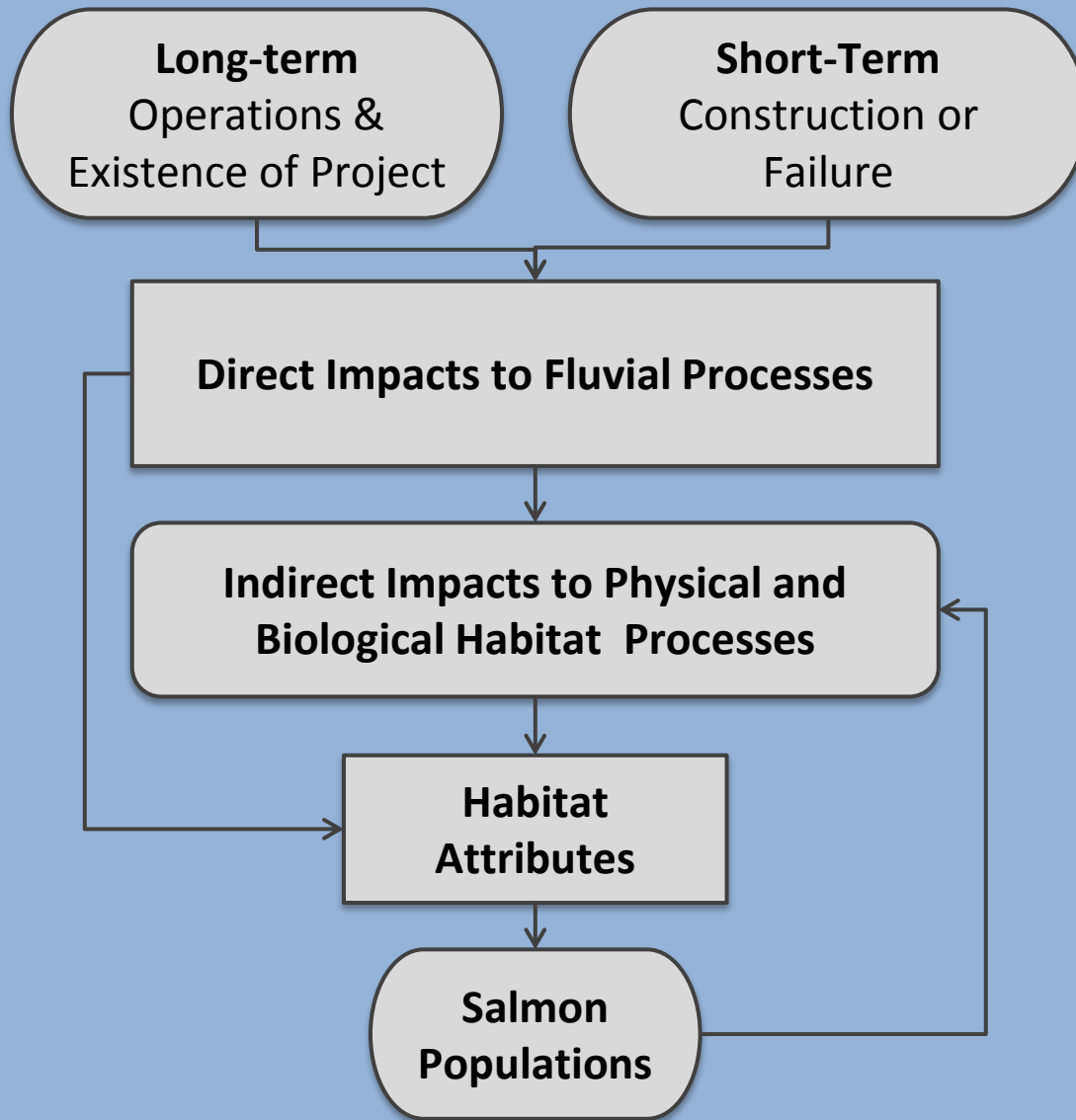
OVERVIEW OF ECOLOGICAL RISK ASSESSMENT

What is risk?

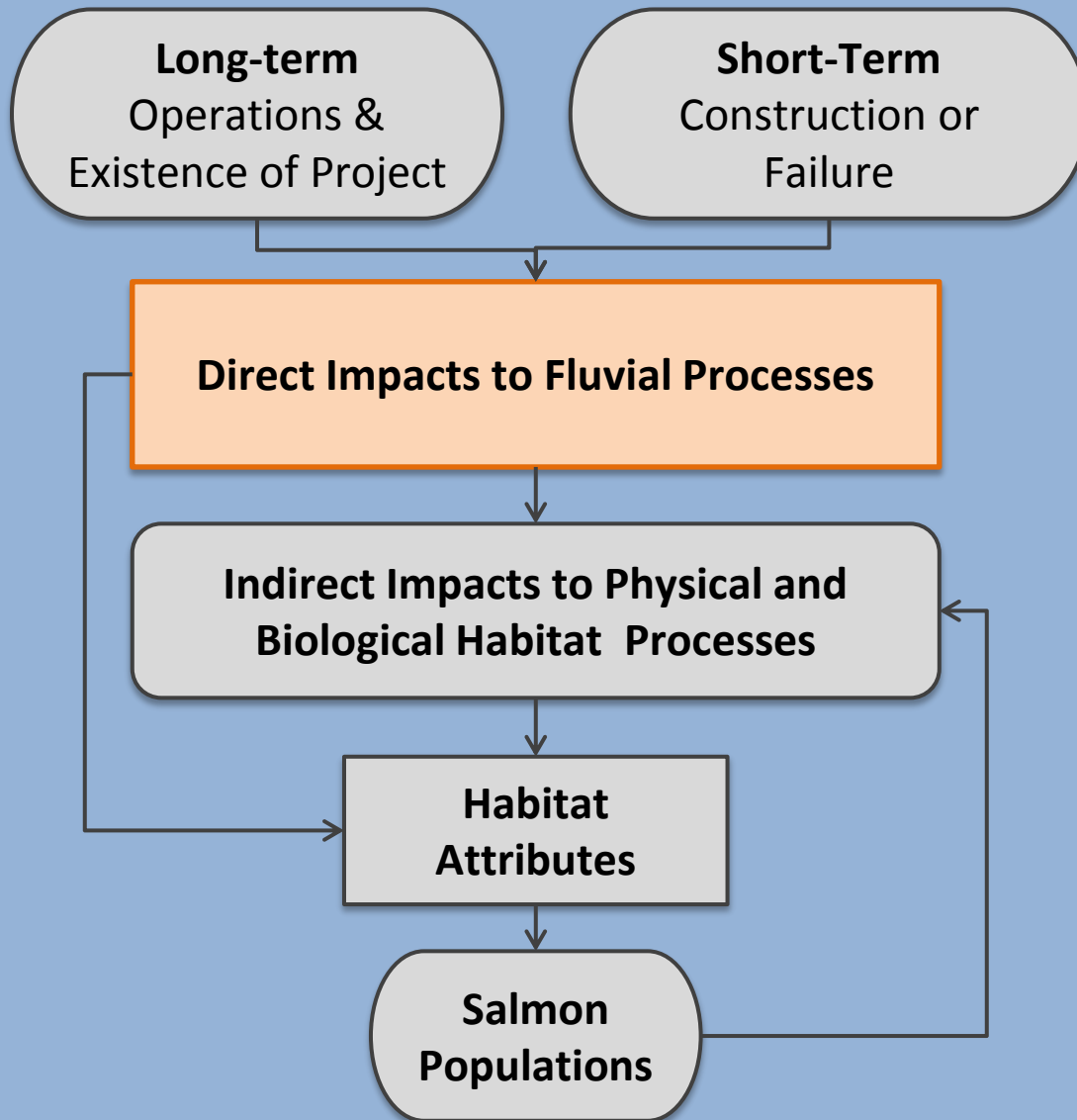
- Magnitude
- Probability
- Uncertainty



Conceptual Model of Risk Propagation

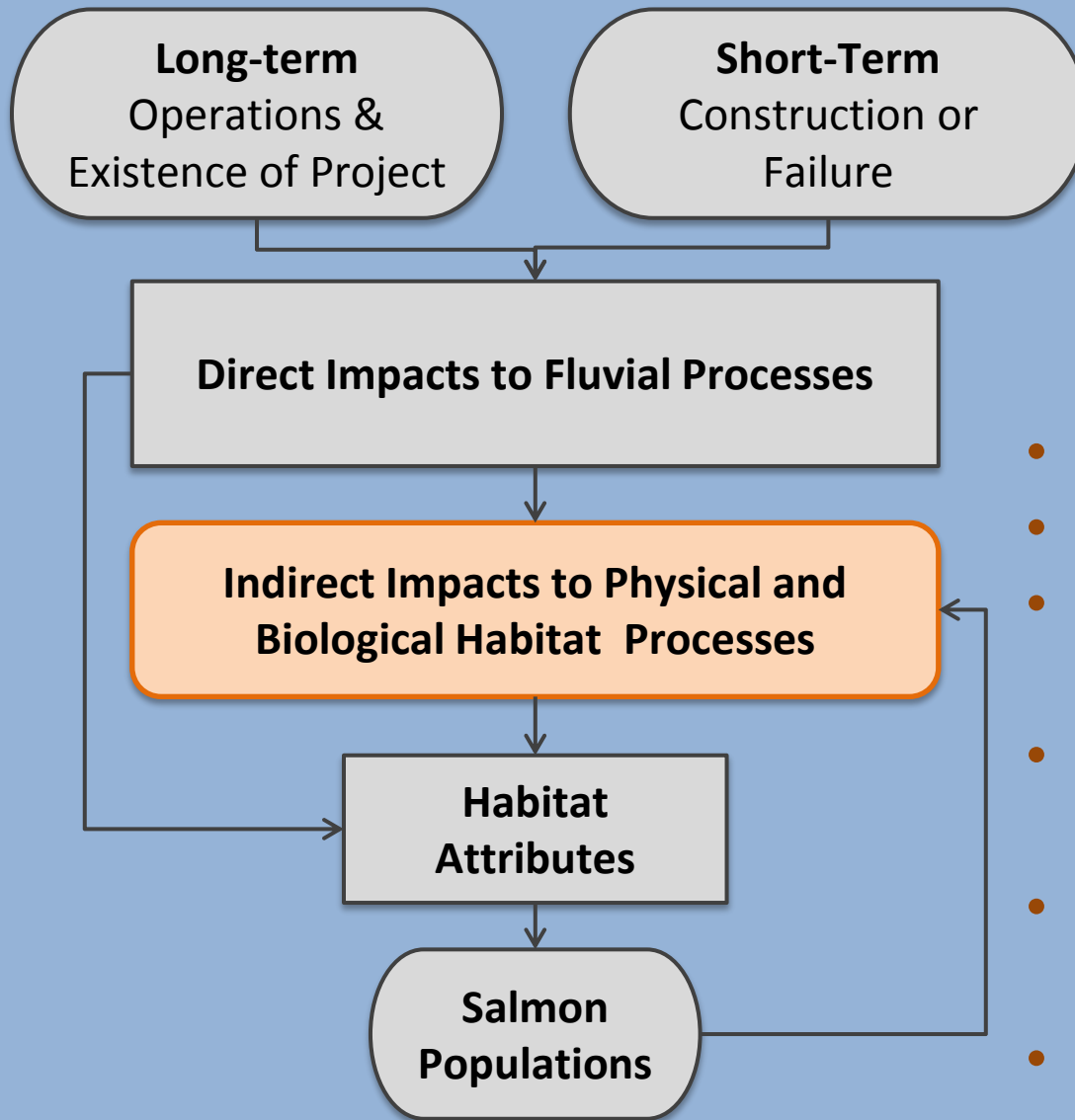


Conceptual Model of Risk Propagation

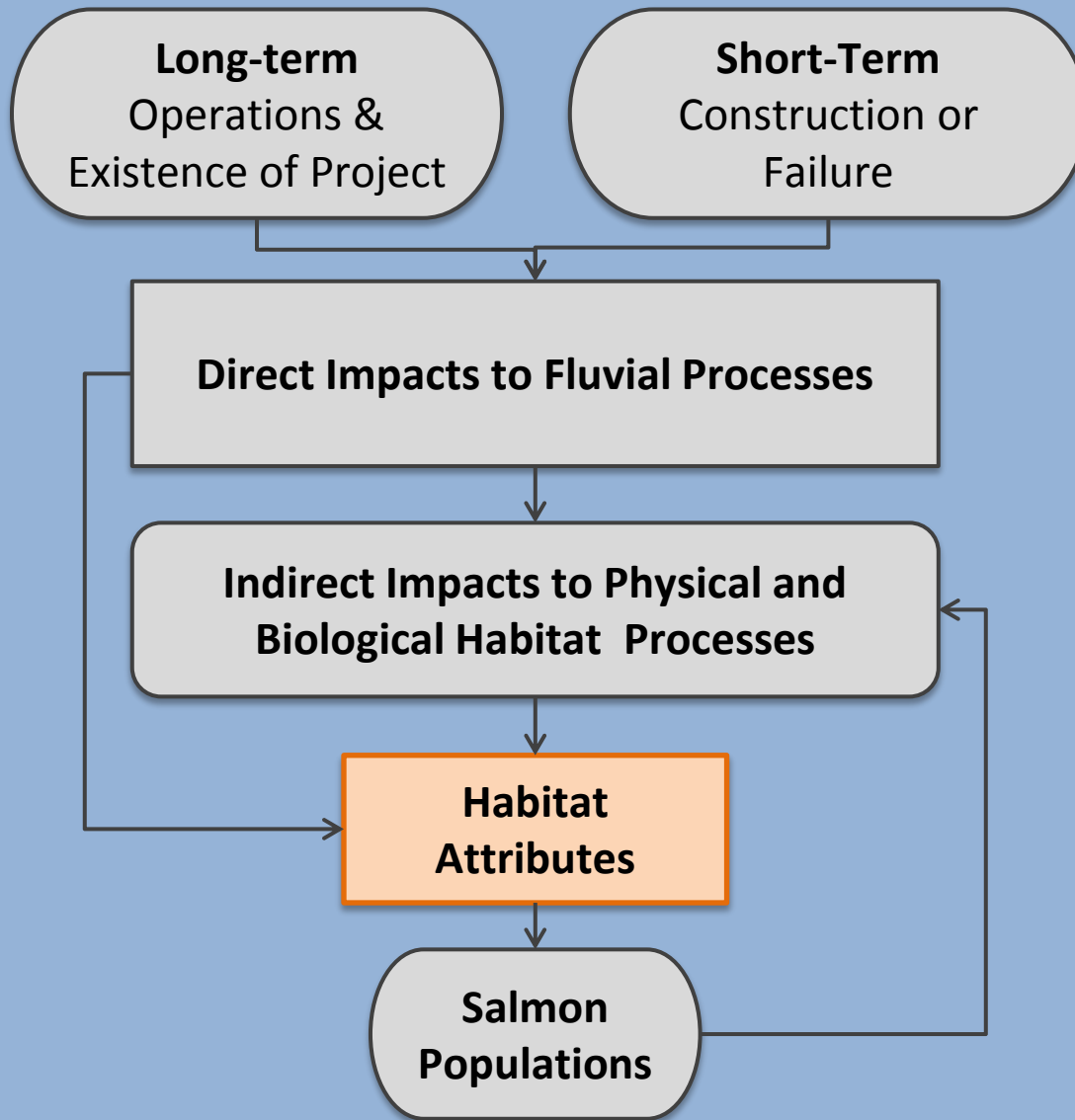


- *Flow regime*
- *Water quality*
- *Sediment supply*
- *Instream barrier*

Conceptual Model of Risk Propagation



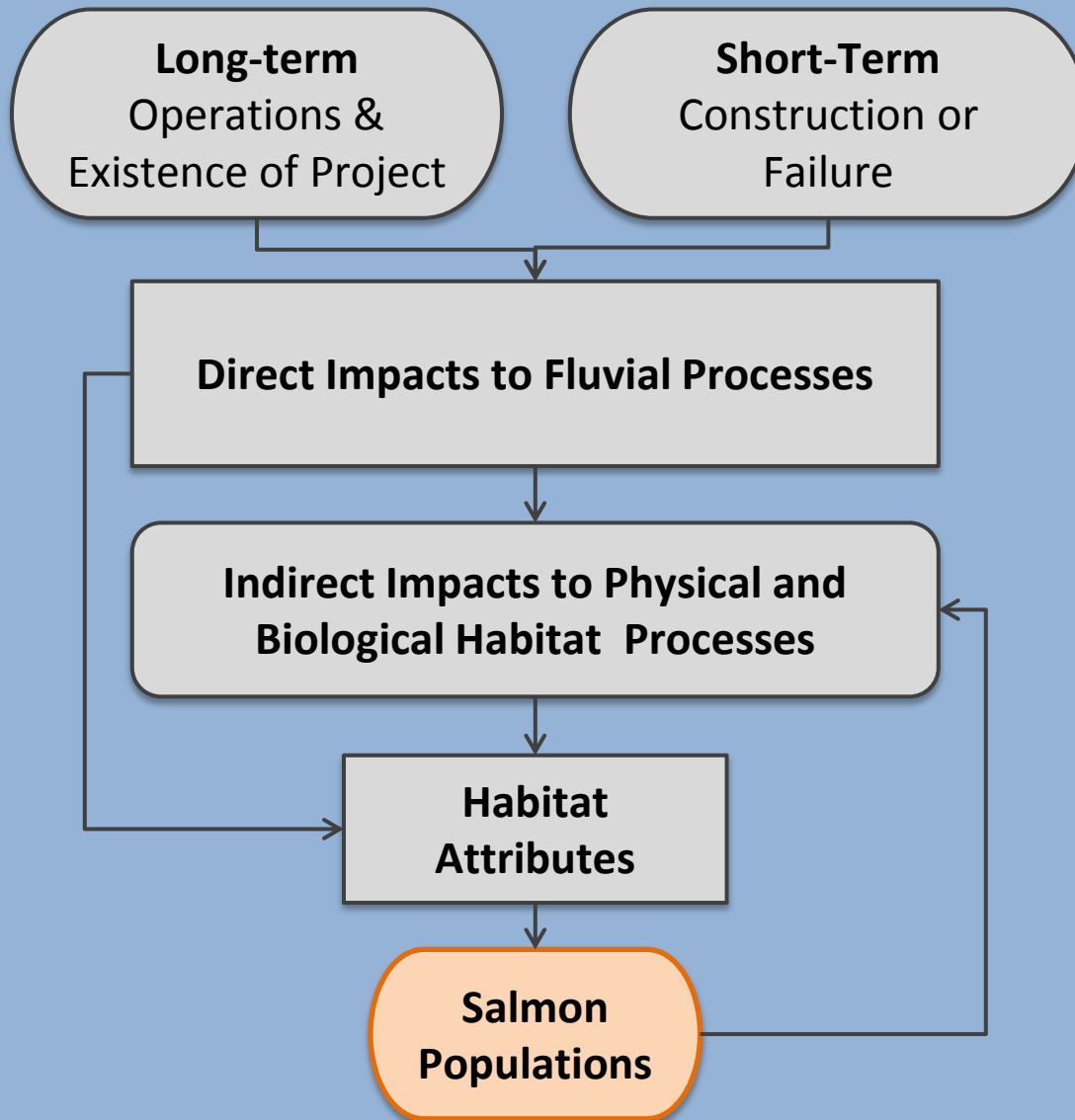
- *Riparian vegetation*
- *Ice formation and break up*
- *Floodplain and channel morphology*
- *Surface and groundwater flow*
- *Sediment erosion and deposition*
- *Nutrient and trophic cycles*



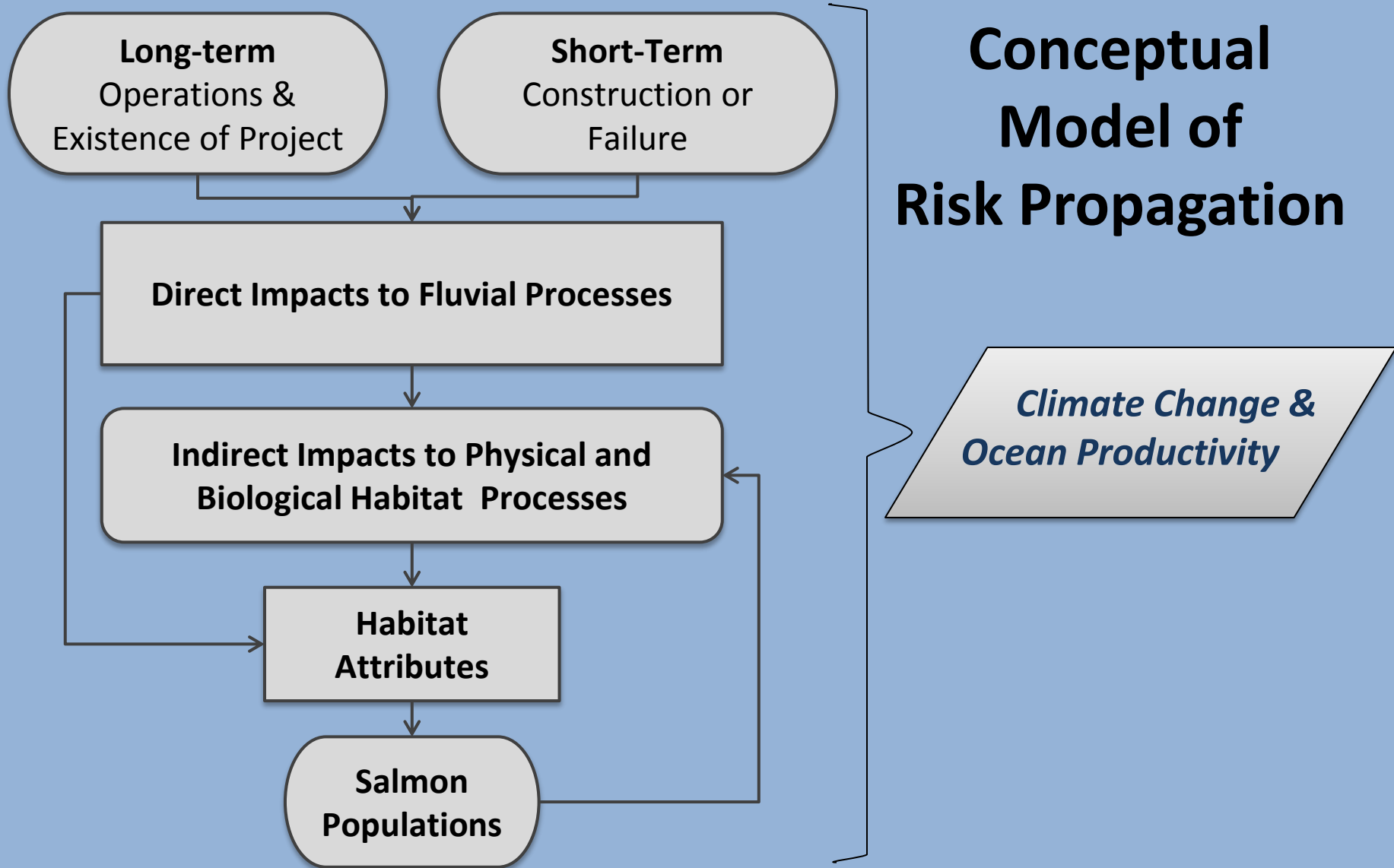
Conceptual Model of Risk Propagation

- *Water quantity*
- *Water quality*
- *Habitat connectivity*
- *Habitat structure*

Conceptual Model of Risk Propagation



- *Abundance*
- *Productivity*
- *Spatial structure*
- *Diversity*



Anticipated Significant Impacts

1. Altered flow regime
2. Changes in water temperature
3. Loss of connectivity between macrohabitats
4. Disruption in migration timing and cues
5. Changes to ice processes



Assumptions & Uncertainties

1. Upstream & downstream passage
2. Duration & intensity of construction and initial inundation phases
3. Population level impacts to salmon
4. Project operations
5. Mitigation
6. Level of precision
7. Lower river effects





Thank you!

**Any
questions?**

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Betty Moore Foundation**