



Chapter 7. Risk considerations

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What is risk?

A function of;

- ▶ Probability
- ▶ Consequence

$$Risk = P(h) \times \sum(C)$$

Where:

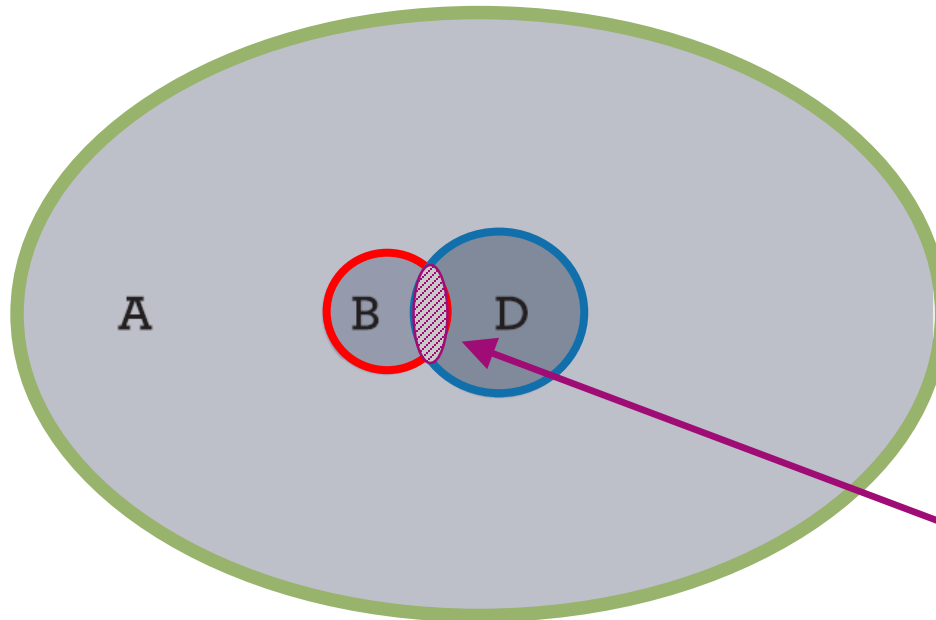
$P(h)$ = Probability of a specific event or combination of events occurring.

$\sum(C)$ = Summation of the consequences of event occurring, typically presented as a monetary cost.

What are the potential consequences?

- Flooding
- Erosion
- Infrastructure
- Recreational
- Private property
- Habitat
 - ▶ What happens to habitat if we do nothing?

What are the hazards?



- A.** All wood in stream reach.
- B.** Portion of wood causing high-risk recreational hazards in stream reach.
- C.** Portion of wood that is both ecologically most functional and causes high-risk recreational hazards.
- D.** Portion of ecologically most functional pieces of wood in stream reach.

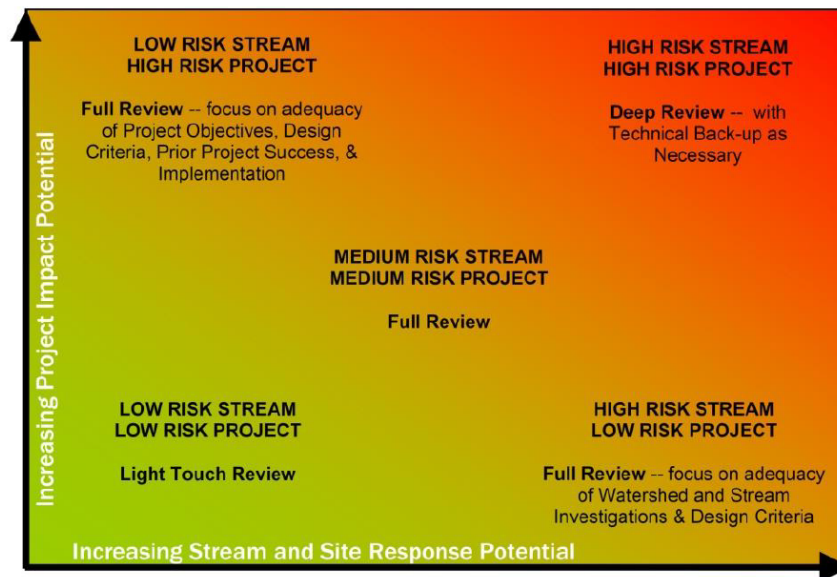
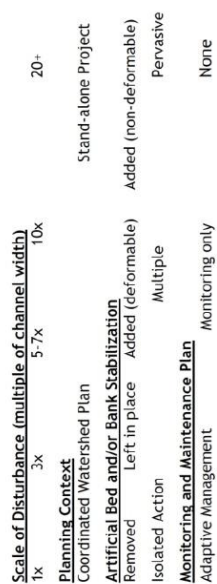
Only a small fraction of LW is an issue

The social engineering...

- Rivers are inherently dangerous
- Perception of “healthy” or “normal” often skewed
- How to address uncertainty in a dynamic system?

What level of assessment?

■ Qualitative vs Quantitative



Project Risk Screening Matrix 2011

<u>Stream Sensitivity / Stream Type</u>			
Source (>10%)		Transport (3–10%)	Response (<3%)
Bedrock	Colluvial	Alluvial	Incised Channel /Alluvial Fan
<u>Riparian Corridor</u>			
Continuous/Wide	Semi-continuous/Wide	Discontinuous/Narrow	Urbanized or Levee Confined
<u>Bank Erosion Potential</u>			
Naturally Non-erodible		Erosion Resistant	Highly Erodible or Revetted
<u>Bed Scour Potential</u>			
Boulder/Clay Bed (low)		Gravel/Cobble Bed (moderate)	Sand/Silt Bed (high)
<u>Dominant Hydrologic Regime</u>			
Spring-fed	Snowmelt	Rain	Rain-on-Snow
			Thunderstorm/Monsoon

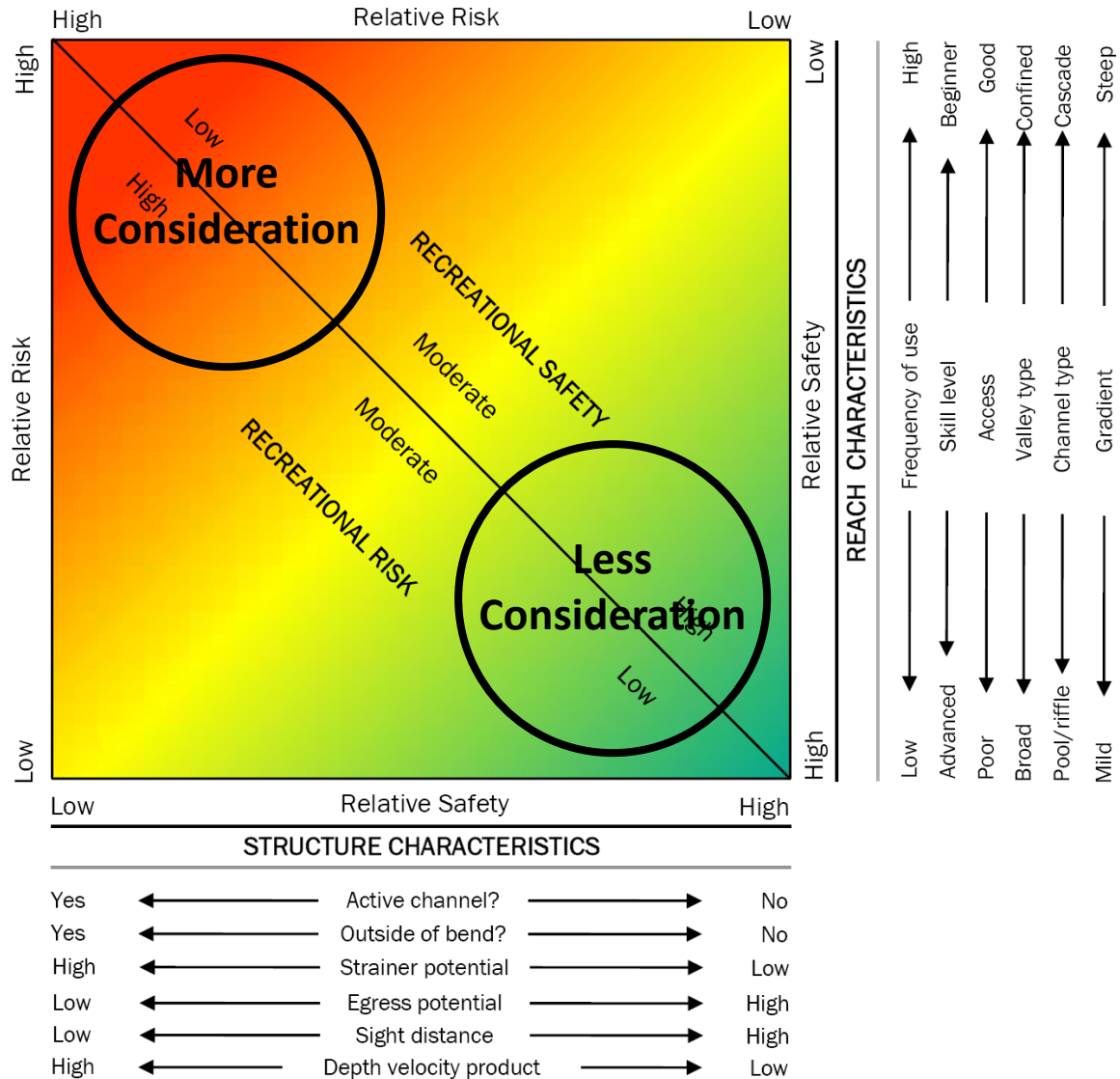
Recreational use and private property

Considerations can be divided into;

- ▶ Reach attributes
- ▶ Local/structure characteristics



Risk assessment model



How to improve safety?

Risk can be mitigated through

- Public education/outreach
- Public notification
- Signage
- Land conservation
- Monitoring and/or adaptive management



Final thoughts on risk...



Rare events do happen ...but shouldn't necessarily impact the final outcome.