

Rainbow Bridge Restoration



Western Bridge Engineers' Seminar
25 September 2007

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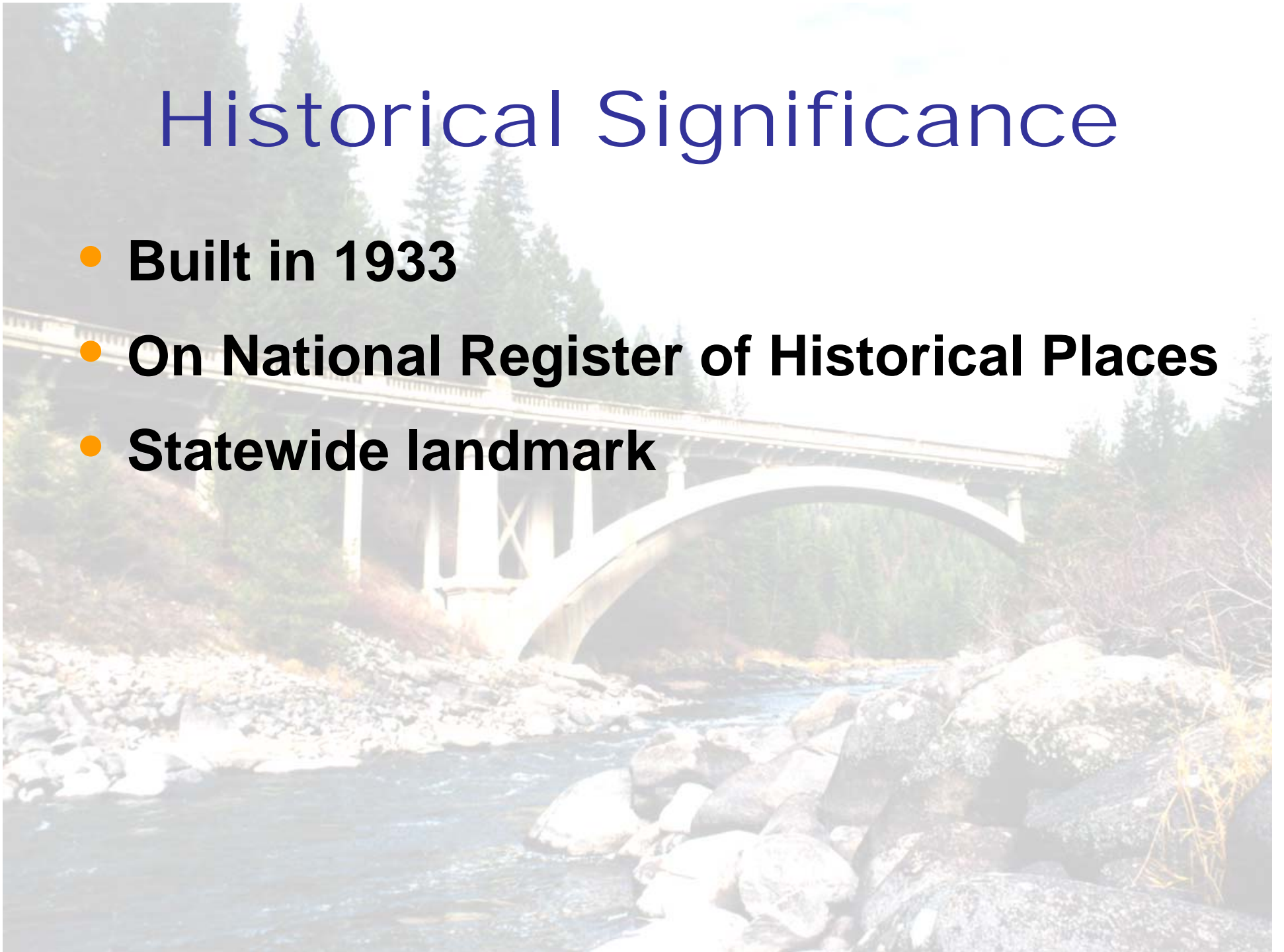
Location

Rainbow Bridge



Historical Significance

- **Built in 1933**
- **On National Register of Historical Places**
- **Statewide landmark**



Project Objective

- **Safety**
- **Historical Restoration**



Condition of Structure

Rails disintegrating



Condition of Structure

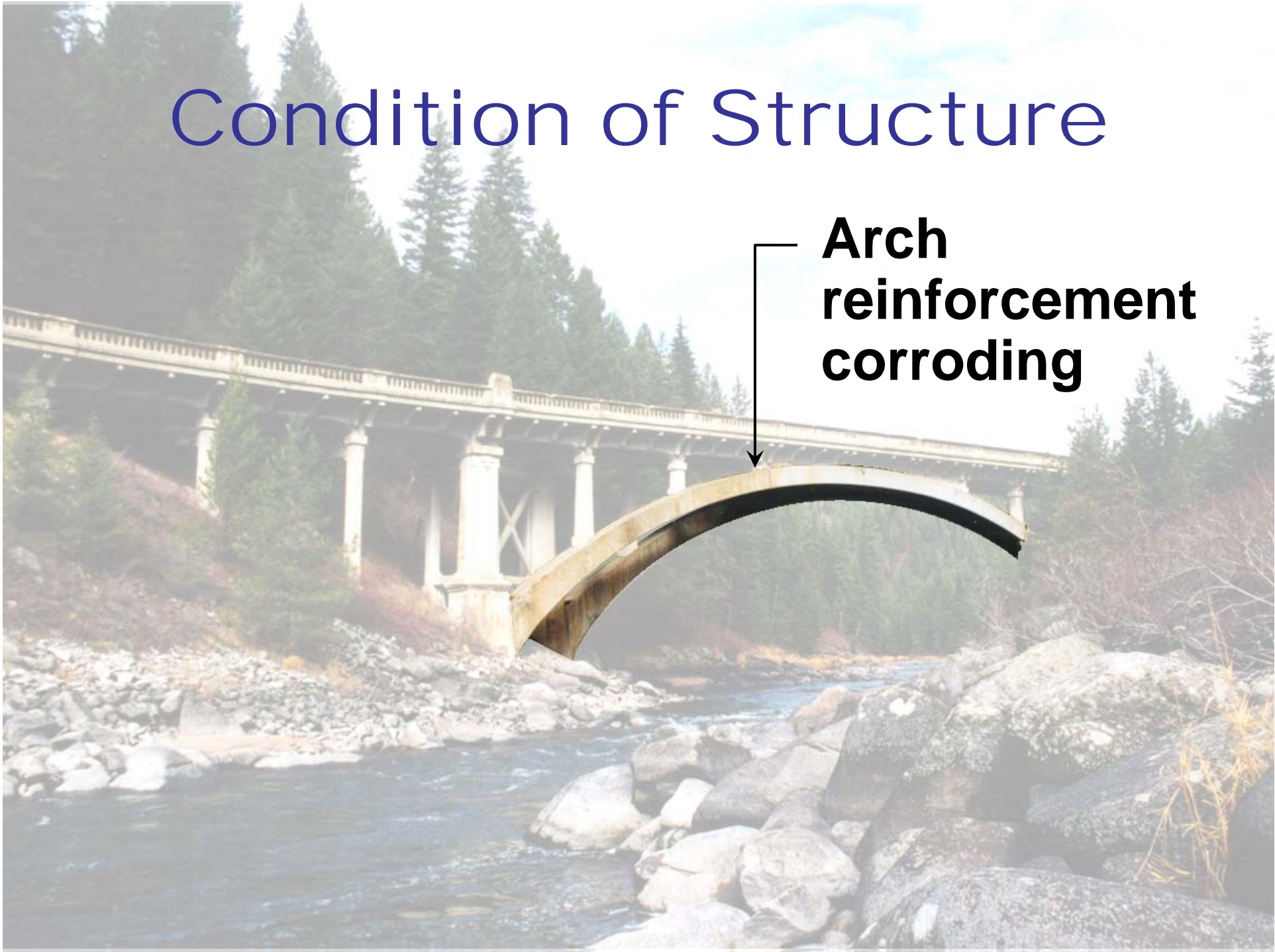


Condition of Structure



Condition of Structure

**Arch
reinforcement
corroding**

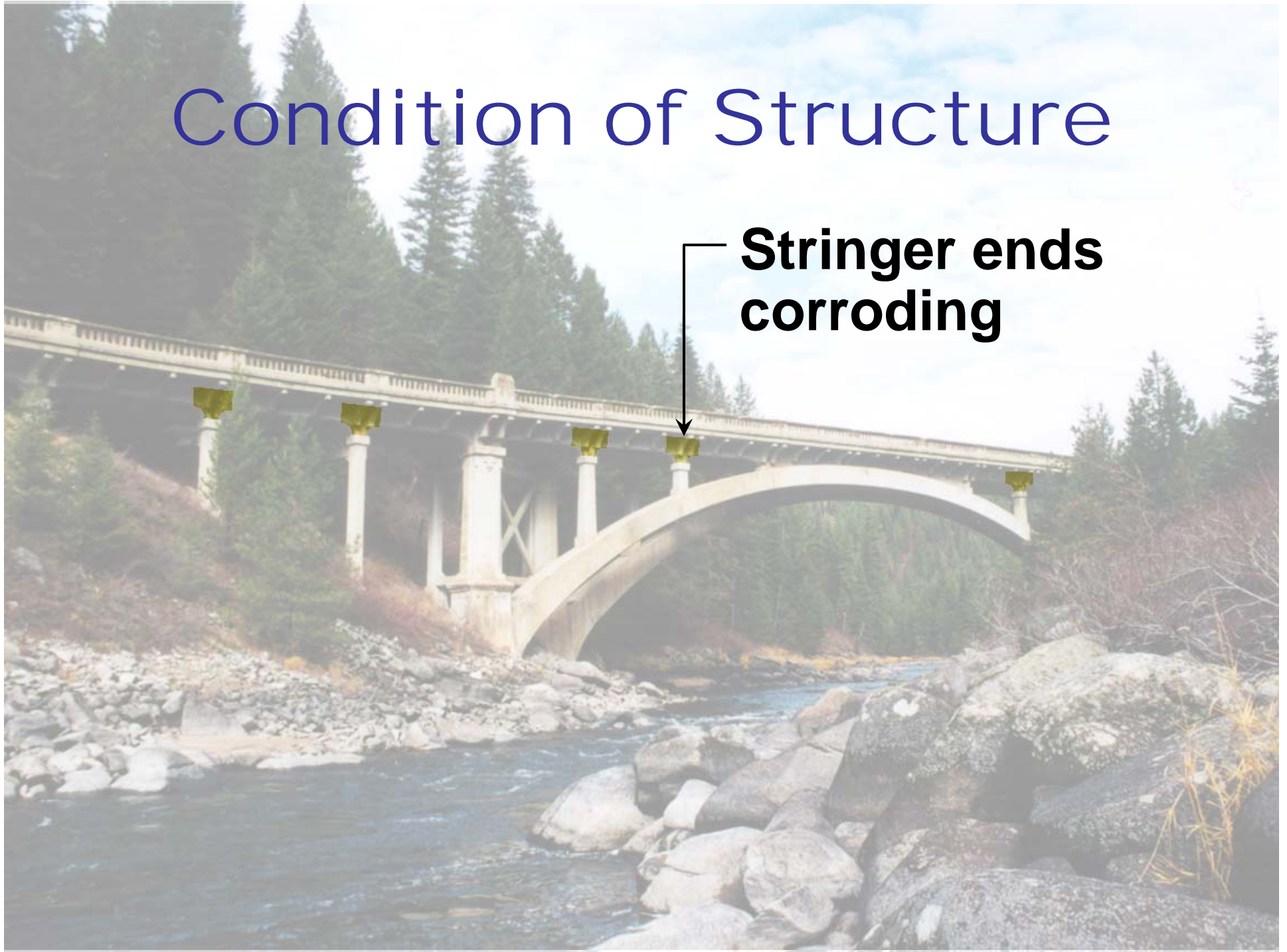


Condition of Structure



Condition of Structure

**Stringer ends
corroding**

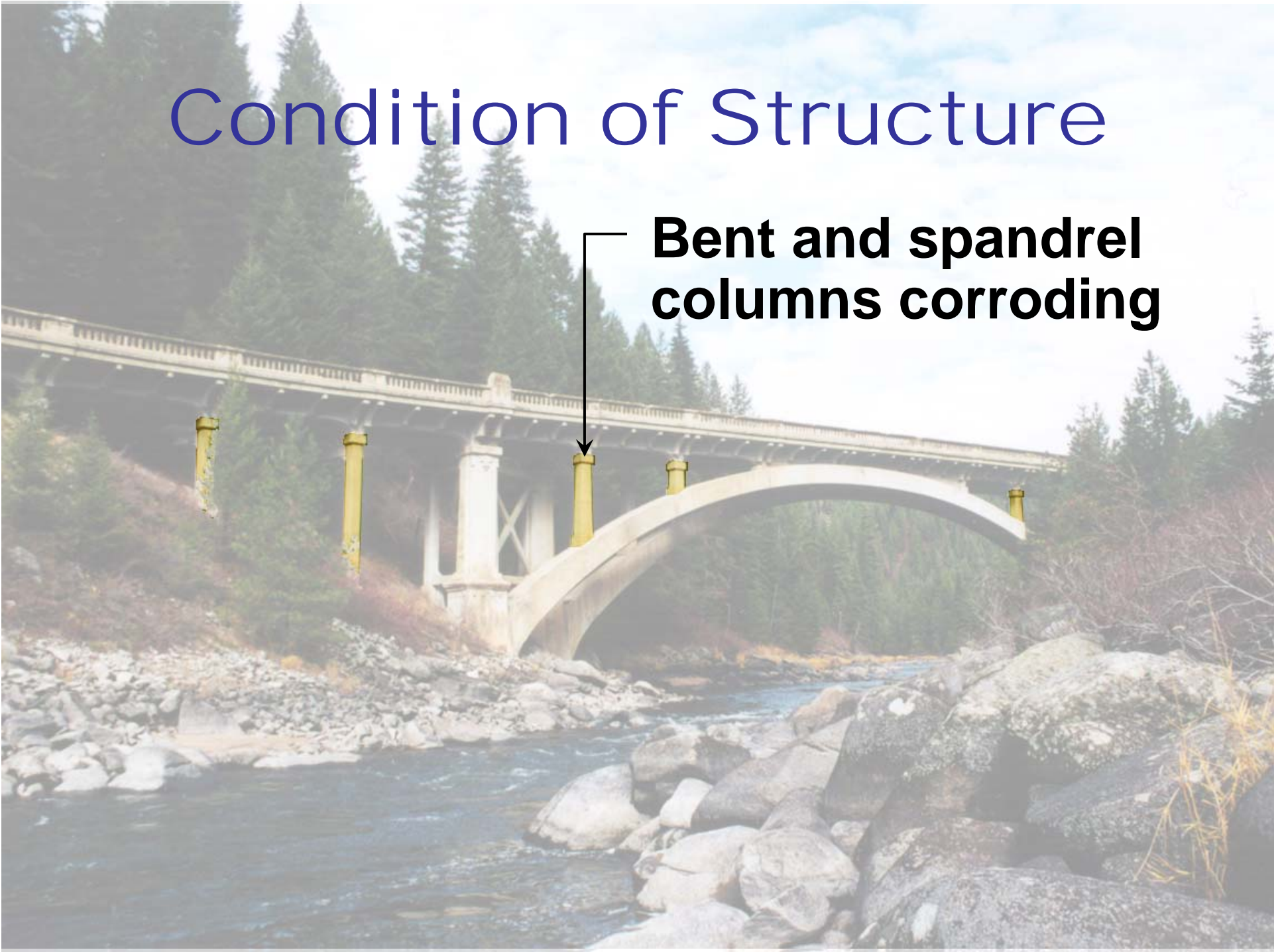


Condition of Structure



Condition of Structure

**Bent and spandrel
columns corroding**

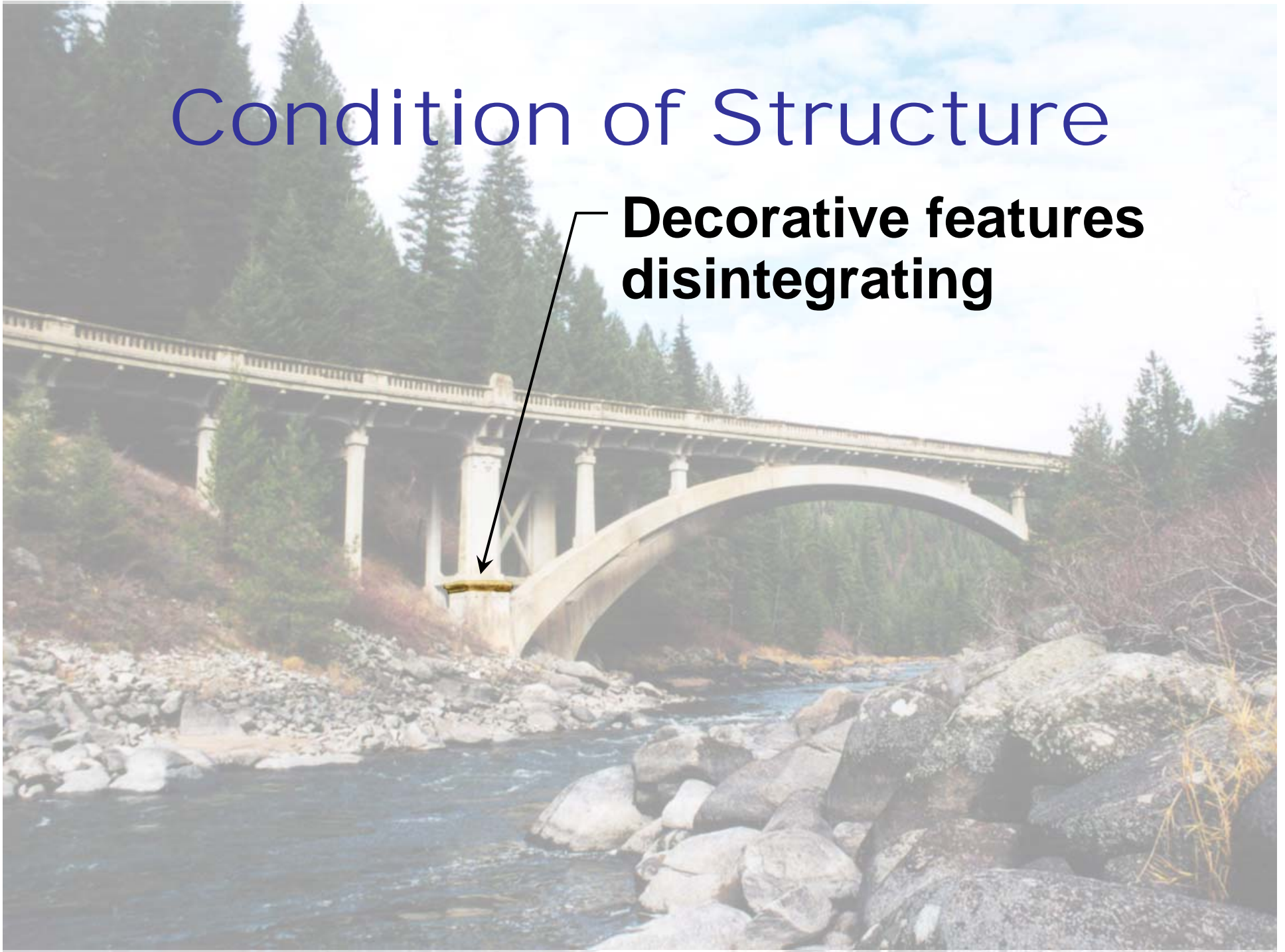


Condition of Structure



Condition of Structure

**Decorative features
disintegrating**



Condition of Structure



Condition of Structure



Work Performed

A stone arch bridge spans a river with a rocky bed. The bridge has a single large arch and a smaller one on the right. The background is a forest of evergreen trees. The text 'Work Performed' is at the top in blue. A list of six items is on the left, each with a yellow dot and bold black text.

- **Arch Stabilization**
- **Column Stabilization**
- **Column Replacement**
- **Aesthetic Feature Replacement**
- **Repair Stringer Ends**
- **Replace Rails**

Work Not Performed

- **Floor Beams**
- **Seismic Retrofit**
- **Deck Repair**
- **Aesthetic Treatment**



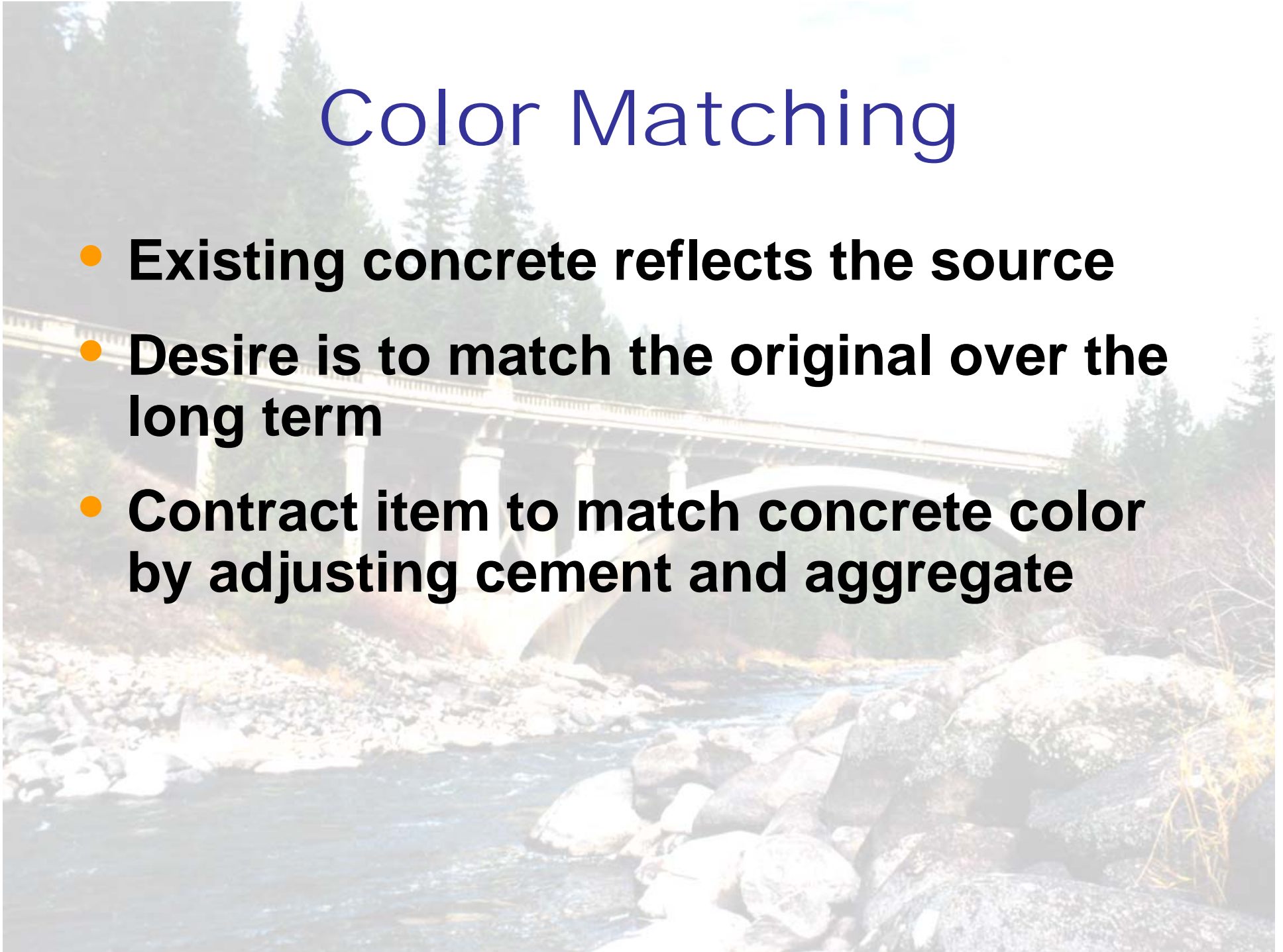
Project Constraints

- **Preserve original fabric**
- **Match color, texture, and shape**
- **Maintenance of Traffic**
- **Meet structural and safety requirements**



Color Matching

- **Existing concrete reflects the source**
- **Desire is to match the original over the long term**
- **Contract item to match concrete color by adjusting cement and aggregate**



Color Matching

- **Composition of original aggregates**
- **Made samples**
- **Cut and polished samples to enhance color**
- **State selected mix**
- **Object is to weather toward the original color**

Color Matching



Color Matching



Maintenance of Traffic



Maintenance of Traffic



Maintenance of Traffic



Stringer End Repair

- **Supported Bridge**
- **Replaced Old Concrete**



Stringer End Repair



Stringer End Repair



Rail Replacement

- **Matched geometry of rail**
- **Matched color**
- **Precast sections**
- **Limited by maintenance of traffic**



Rail Replacement



Rail Replacement



Rail Replacement



Rail Replacement



Rail Replacement



Rail Replacement



Rail Replacement



Rail Load Test



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