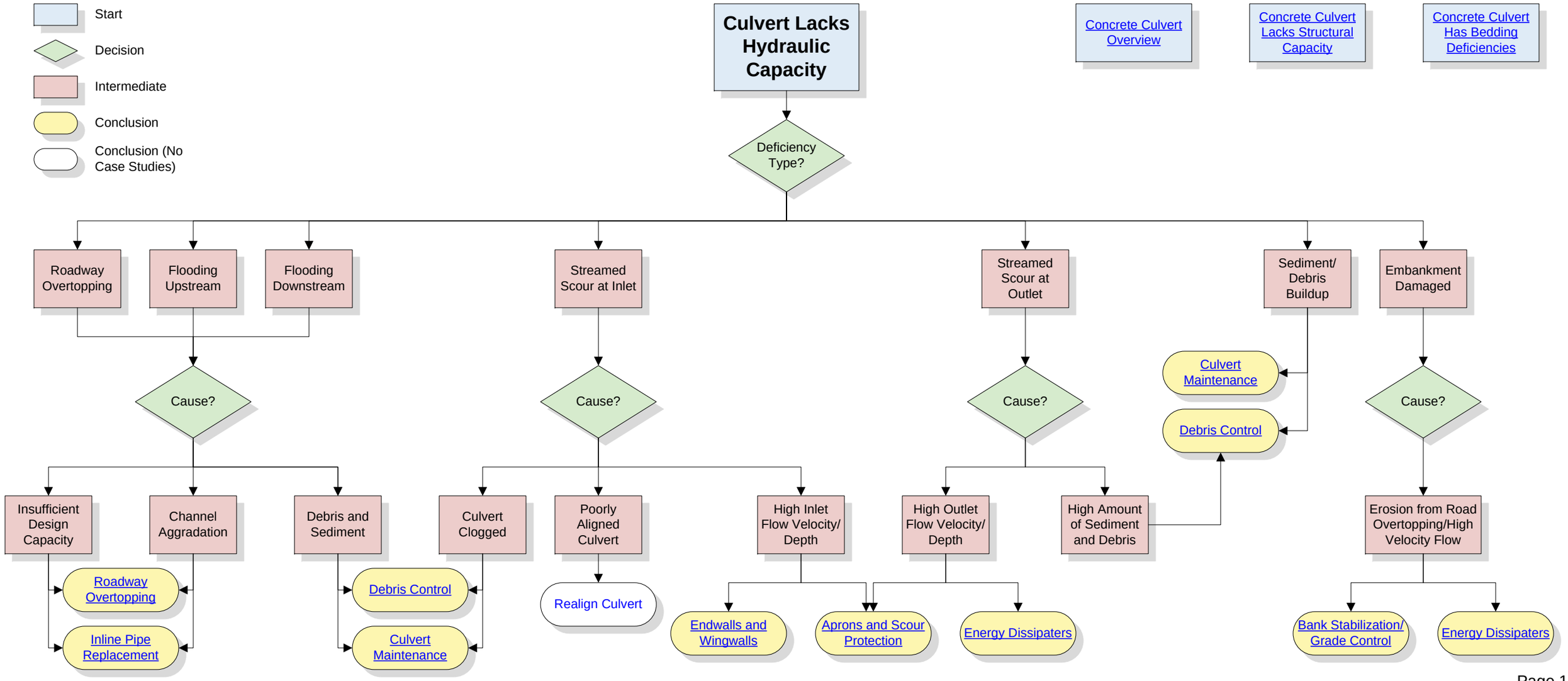
Start
Decision
Intermediate
Conclusion
Conclusion (No Case Studies)
Culvert Lacks Hydraulic Capacity
Concrete Culvert Overview
Concrete Culvert Lacks Structural Capacity
Concrete Culvert Has Bedding Deficiencies
Deficiency Type?
Roadway Overtopping
Flooding Upstream
Flooding Downstream
Streamed Scour at Inlet
Streamed Scour at Outlet
Sediment/ Debris Buildup
Embankment Damaged
Cause?
Cause?
Cause?
Cause?
Culvert Maintenance
Debris Control
Insufficient Design Capacity
Channel Aggradation
Debris and Sediment
Culvert Clogged
Poorly Aligned Culvert
High Inlet Flow Velocity/ Depth
High Outlet Flow Velocity/ Depth
High Amount of Sediment and Debris
Erosion from Road Overtopping/High Velocity Flow
Roadway Overtopping
Inline Pipe Replacement
Debris Control
Culvert Maintenance
Realign Culvert
Endwalls and Wingwalls
Aprons and Scour Protection
Energy Dissipaters
Bank Stabilization/ Grade Control
Energy Dissipaters