

### North Slope Fish Passage Designs & Hydrologic Studies



**Location:** North Slope, Alaska

**Client:** BP Alaska

**Key Project Elements:**

- ❖ Geomorphic Assessment
- ❖ Hydraulic Modeling
- ❖ Sediment Transport
- ❖ Stream Gage Installation
- ❖ Flood Frequency Analysis
- ❖ Culvert Design
- ❖ Fish Passage Design
- ❖ Stream Simulation Design



**Project Description:**

Restoration Engineering, LLC team members have completed many water resource projects across the North Slope of Alaska over the past decade. A few examples of these projects are described in the next few paragraphs.

We developed a fish passage assessment and culvert monitoring program for a client who operates a large oilfield on the North Slope. This program involved development of a detailed monitoring workplan, field implementation, data analysis, annual reporting. Monitoring activities were performed twice a year on over 40 road-stream crossing sites for three years. The purpose of the monitoring activities was to assess fish passage conditions and to determine if crossings were operating effectively from an engineering and safety standpoint.

Our team designed ten new road-stream crossings to provide fish passage, sediment transport and convey flood flows up to the 100-year event. New crossings use both embedded structures and overflow structures to ensure river function, fish passage, and flood conveyance. The crossings were designed to withstand loads up to several million pounds.

RE team members also performed a detailed hydrologic study to develop region-specific flood frequency information for the future design and analysis of hydraulic structures on the North Slope. This study involved the installation and operation of five real-time stream gage stations, development of stage-discharge relationships and analysis of stream flow data.

We performed a geomorphic and sediment transport study of the Putuligayak River to evaluate natural versus man-made patterns of sediment deposition. This project involved a combination of field investigations and historic aerial photo interpretation to understand the dynamic nature of sediment transport and movement in this river system.