



Hydropower

Effects of Hydroelectric Facilities on Fish

A hydroelectric facility can disrupt properly functioning fish habitat by altering the stream's natural flow regime:

- The ramping rate, a measure of how quickly the flow through a hydroelectric facility is increased or decreased, may differ from the stream's natural flow rate and may either flush or strand fish if the water level in the stream changes too rapidly or dramatically. A ramping rate based on sound analysis and properly managed can alleviate these concerns.
- In a bypass reach, instream flows will be changed and there may be related effects on the stream's channel and ecology.
- Flow downstream of the project may change if diverted water is not returned to the same stream; for example, the City of Bellingham's Middle Fork diversion sends diverted water to Lake Whatcom via a tunnel and pipeline.
- Fish may lose access to off-channel habitat, such as side channels, if instream flows are decreased to the point where only the main stream channel contains water.

Hydroelectric facilities can also impair water quality:

- Water can become saturated with nitrogen gas, which can reach levels that are toxic and/or produce effects similar to the "bends".
- The natural temperature regime may change.
- Turbidity may change in the bypass reach or in the receiving stream or water body.
- During project construction and operation, the risk of both chronic and catastrophic (i.e., landslides) sedimentation and/or slope failure introducing sediment to the stream may also increase.

Constructing a hydroelectric project and placement of the pipeline essentially parallel to the stream could damage or destroy riparian vegetation, which helps to control water temperature and stream flow, and provides woody material that helps form fish habitat in the stream.