## THREAT LEVEL

### IDAHO FISH & GAME

**Critically Imperiled:**
*very high risk of extirpation*

### WASHINGTON DEPARTMENT OF FISH & WILDLIFE
**(PRIORITY HABITAT & SPECIES PROGRAM)**

**Species of Greatest Conservation Need**

## CALL TO ACTION

- Research adult population viability after hatchery release
- Identify and protect key cold-water habitat
- Protect burbot from overfishing

# Burbot

*Lota Lota*

Photo Credit: Kootenai Tribe of Idaho

## OVERVIEW

Burbot are a cold-water species and seek cooler water in warmer months. As average water temperatures increase, burbot may face challenges finding areas with sufficiently cold water. Burbot are slow to mature, which makes it difficult to evaluate how environmental changes are impacting the species at different life stages. The Tribal hatchery has been successful in restoring the burbot fishery. However, additional research and monitoring is important for ensuring natural reproduction and survival. Protections to avoid overfishing are vital if burbot populations remain open to fishing. Identifying and protecting key cold-water habitats can support burbot as water temperatures rise.

## CONSERVATION CONSIDERATIONS

### VULNERABILITY RANKING

| CLIMATE | NON-CLIMATE | CONFIDENCE |
|---|---|---|
| MODERATE-HIGH | MODERATE-HIGH | MODERATE |

**Physiological, phenological, or ecological factors to consider when planning conservation projects:**

- Burbot rely on cold water temperatures for spawning
- Slow maturation rates can limit their ability to rebound from over-fishing and other contributors to habitat loss

### Vulnerability Rankings Methodology

*These priority species have been assessed for climate and non-climate vulnerability using a process adapted from the Washington Department of Fish & Wildlife's Methodology for ranking the Climate Change Vulnerability of Species. WDFW's approach includes rating each species' climate sensitivity and exposure. These two rankings are then averaged for a climate vulnerability ranking. The Tribe developed a non-climate vulnerability ranking to capture species' relative risk and adaptability to factors such as human-caused development, predator/prey relationships, or low population numbers. Confidence rankings were assessed based on the availability of scientific research.*

# KEY THREATS

## Habitat Degradation & Loss

Changes in stream temperature due to alterations in the Kootenay River, including from Libby Dam, caused significant harm to burbot over the 20th century. A lack of knowledge and management for burbot's thermal requirements and continued harvesting contributed to burbot decline.

## Climate Change

- Burbot rely on cold water for spawning and survival. Increasing water temperatures impact habitat suitability during key phases of their life-cycle.
- Decreased snowpack and shifting precipitation patterns are impacting the timing and volume of water in streams and rivers.

Photo Credit: Kootenai Tribe of Idaho

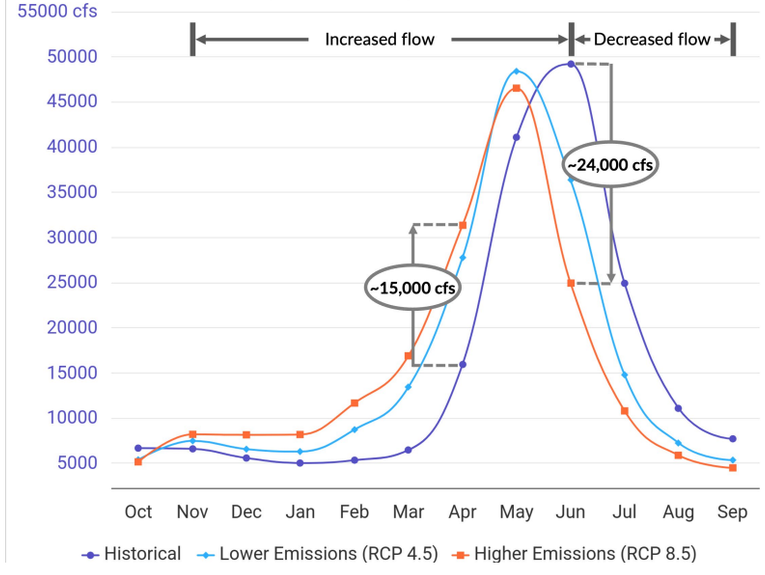
## PROJECTED AVG AUGUST STREAM TEMPERATURE (°C)

| Stream location | Historical | Mid century (2040) | Late century (2080) |
|---|---|---|---|
| Boundary Creek, at Saddle creek | 10.6 | 12.3 | 13.2 |
| "Lower" Smith Creek | 14.1 | 15.5 | 16.5 |
| "Upper" Smith Creek | 11.0 | 12.2 | 13.2 |
| Kootenai River, Copeland Rd. crossing | 16.2 | 17.7 | 18.7 |
| Kootenai River, Nimz ranch | 16.0 | 17.4 | 18.5 |
| "Upper" Myrtle creek | 10.3 | 11.5 | 12.4 |
| "Lower" Myrtle creek | 13.5 | 14.8 | 15.7 |
| Deep Creek, where Pine Island Rd ends | 15.2 | 16.7 | 17.7 |
| Kootenai River, Leonia | 17.0 | 18.5 | 19.6 |
| Deep Creek, at Ruby creek | 14.5 | 15.9 | 16.9 |

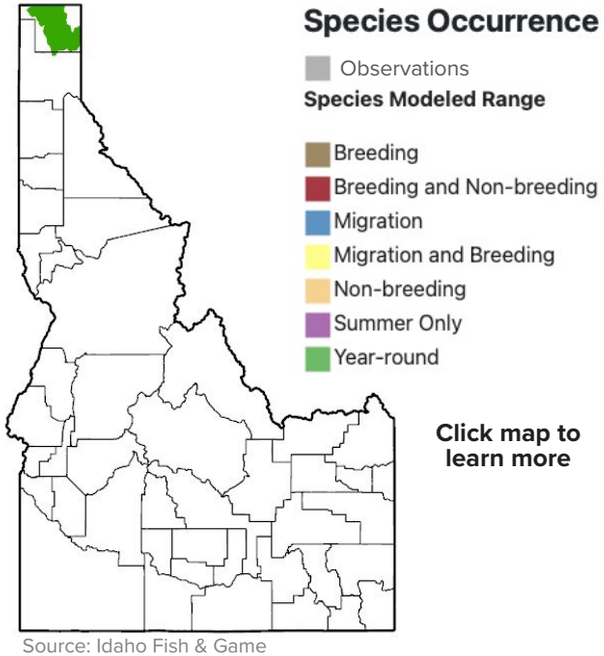
Source: US Forest Service

## PROJECTED NON-REGULATED STREAMFLOW (2070-2099)

### KOOTENAY RIVER AT BONNERS FERRY, ID




Source: Climate Toolbox. Accessed on December 14, 2024




Source: Idaho Fish & Game

## REFERENCES


Washington Department of Fish & Wildlife. *Burbot*. https://wdfw.wa.gov/species-habitats/species/lota-lota.

Idaho Fish & Game. *Lota lota (Burbot)*. https://idfg.idaho.gov/species/taxa/16458.

Idaho Fish & Game. *It's known as a 'Kootenai leopard' and it tastes like lobster. Introducing, the burbot.* https://idfg.idaho.gov/press/its-known-kootenai-leopard-and-it-tastes-lobster-introducing-burbot. Jaunary 2022.

Isaak, D.J., et. al. 2016. NorWeST modeled summer stream temperature scenarios for the western U.S. Fort Collins, CO: Forest Service Research Data Archive. https://research.fs.usda.gov/rmrs/projects/norwest#modeled-summer-stream-temperatures.

Christine Coulter. *Scientists work to revitalize burbot population in Kootenay Lake*. CBC News. https://www.cbc.ca/news/canada/british-columbia/scientists-work-to-revitalize-burbot-population-in-kootenay-lake-1.4542357. February 20, 2018.

Isaak, D.J., et. al. 2016. NorWeST modeled summer stream temperature scenarios for the western U.S. Fort Collins, CO: Forest Service Research Data Archive. https://research.fs.usda.gov/rmrs/projects/norwest#modeled-summer-stream-temperatures.

Streamflow: Hegewisch, K.C., Abatzoglou, J.T. *Future Streamflows* web tool. Climate Toolbox. https://climatetoolbox.org/. (Accessed April 30, 2025).

NatureServe. 2025. NatureServe Explorer [Google Chrome]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/pro/. (Accessed: November 12, 2025).


# PRIORITY AT-RISK SPECIES

## KOOTENAI TRIBE OF IDAHO