



# Land Use – High Dam Option

## Access

- Access would be reduced to the west of the reservoir. New roads would be built to maintain critical access in both the U.S. and Canada

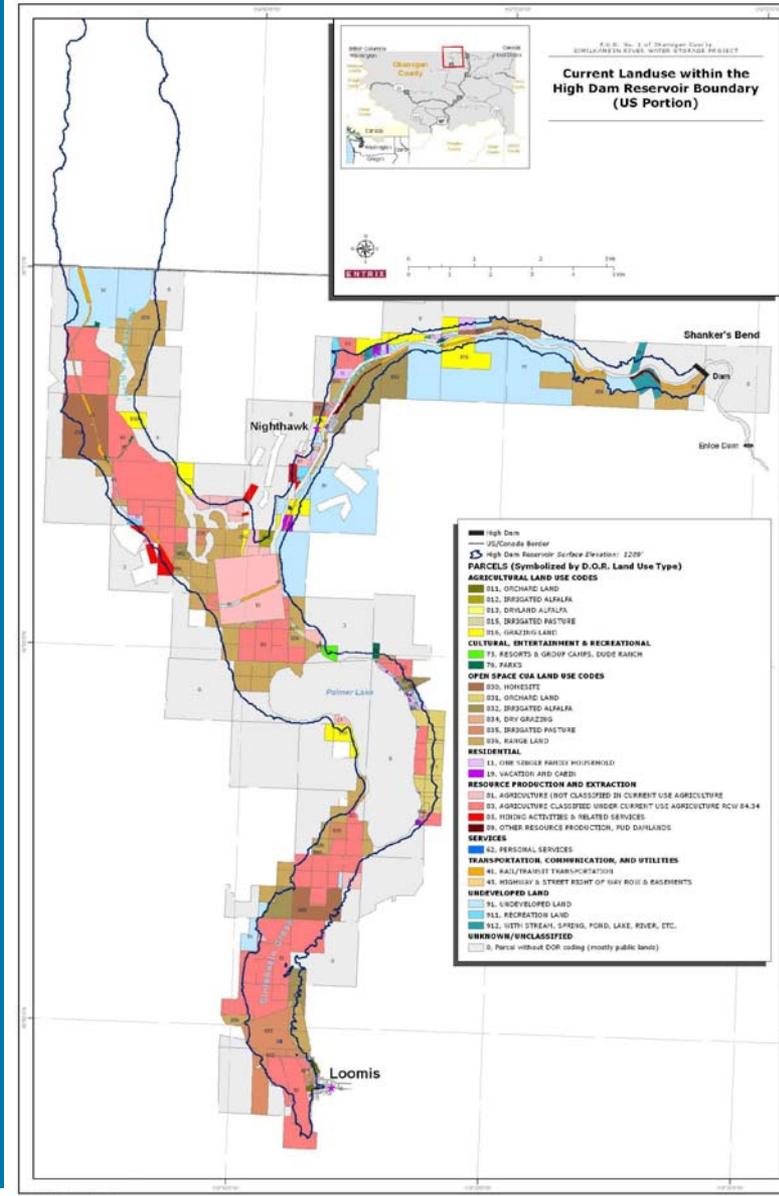
## Acres Inundated

### UNITED STATES:

- Agriculture: 272 acres
- Open Space: 3134 acres
- Resource Production & Extraction: 3504 acres
- Residential: 161 acres
- Cultural, Entertainment & Recreational: 42 acres
- Native American Trust lands: 1036 acres
- Transportation, Communication & Utilities: 150 acres
- Undeveloped Land: 617 acres
- Unclassified: 3523 acres

### CANADA:

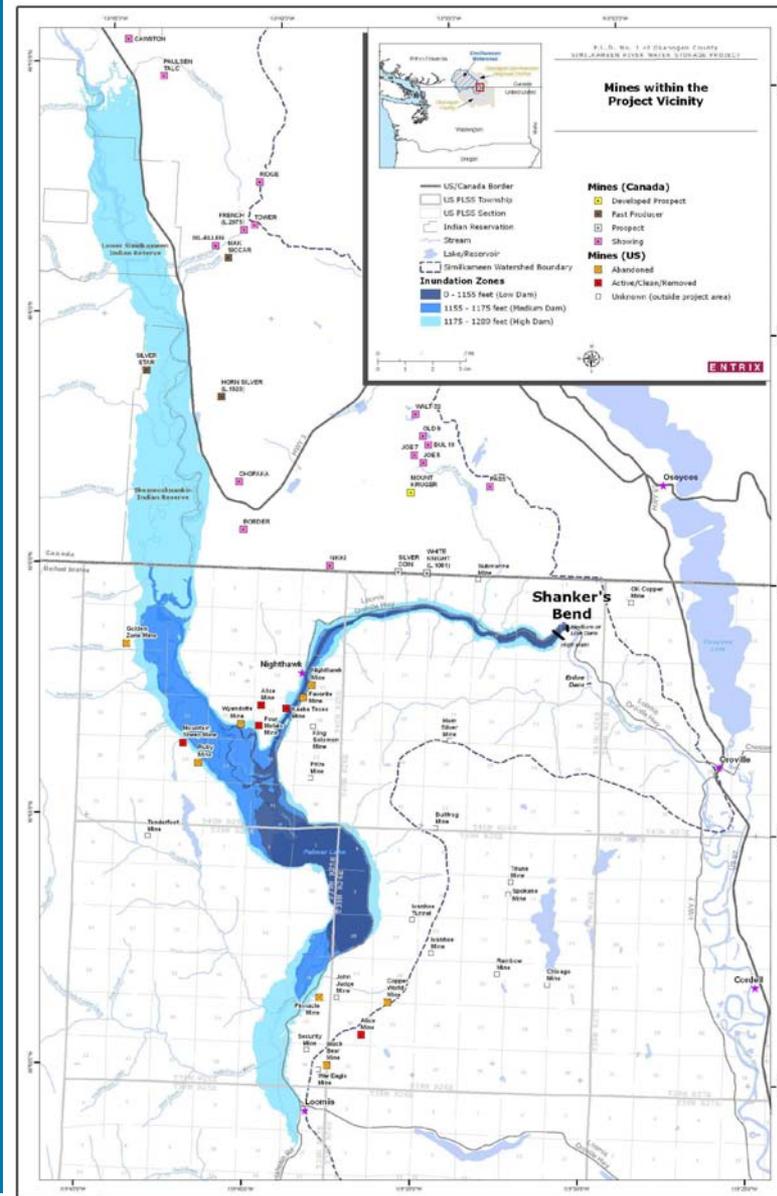
- First Nations Reservation: 6,000 acres
- Private Land: 2100 acres
- Crown Land: 800 acres
- Protected areas: 89 acres





# Water Quality – High Dam Option

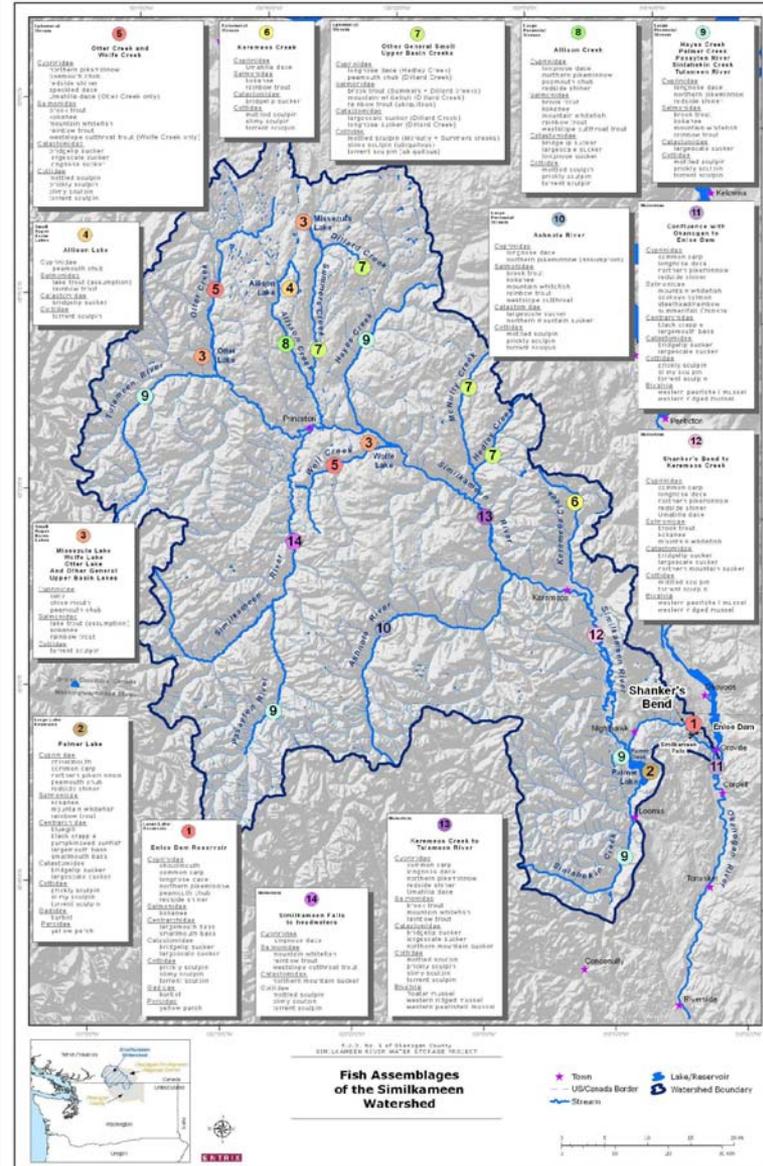
- Benefits arise from providing a mix of cool, oxygenated water from multilevel intake tower, benefiting downstream anadromous fish and ameliorating existing problems
- Inundation of 7 mines would not be expected to cause important effects to water quality
- Ability to provide 100% of minimum instream flow requirements throughout the year
- Provide about 2°C cooler water to instream use during summer months
- Reduced turbidity downstream, benefiting salmonid spawning habitat.
- Reduced spring and increased summer discharge, potentially benefiting fish
- Ability to increase DO downstream through managed flow releases, benefiting aquatic resources.





# Aquatic Resources – High Dam Option

- The High Dam offers notable potential for benefits, as cool, oxygenated flow releases may be timed and shaped to deliver water to benefit downstream anadromous fish and other instream environmental values.
- Minor negative impacts are largely limited to the inundation zone. Increased net productivity of aquatic life associated with an increase in available nutrients.
- Provide 100% of target instream flows during summer months
- Loss of 85,937 meters of mainstem fluvial habitat
- Increase in warm water recreational fishery
- 63% increase in potential kokanee spawning habitat with access to small tributaries
- 41% loss of spawning/rearing habitat in Canada
- Increase in carrying capacity of anadromous salmonids and other resident species
- Potential to increase recreational fishing opportunities





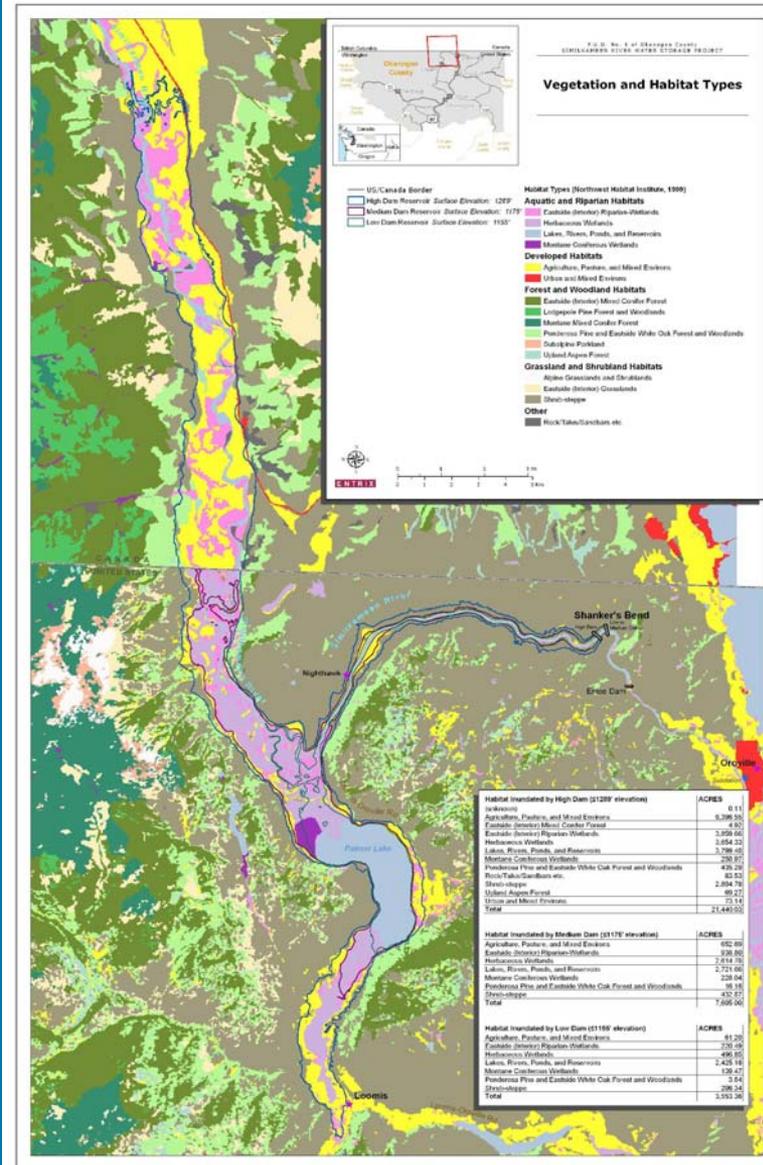
# Terrestrial Resources – High Dam Option

## Wetlands:

- 3,680 acres Eastside (Interior) Riparian-Wetlands inundated
- 3,654 acres Herbaceous Wetlands inundated
- 259 acres Montane Coniferous Wetlands inundated
- Possible wetland development on new shoreline areas

## Wildlife:

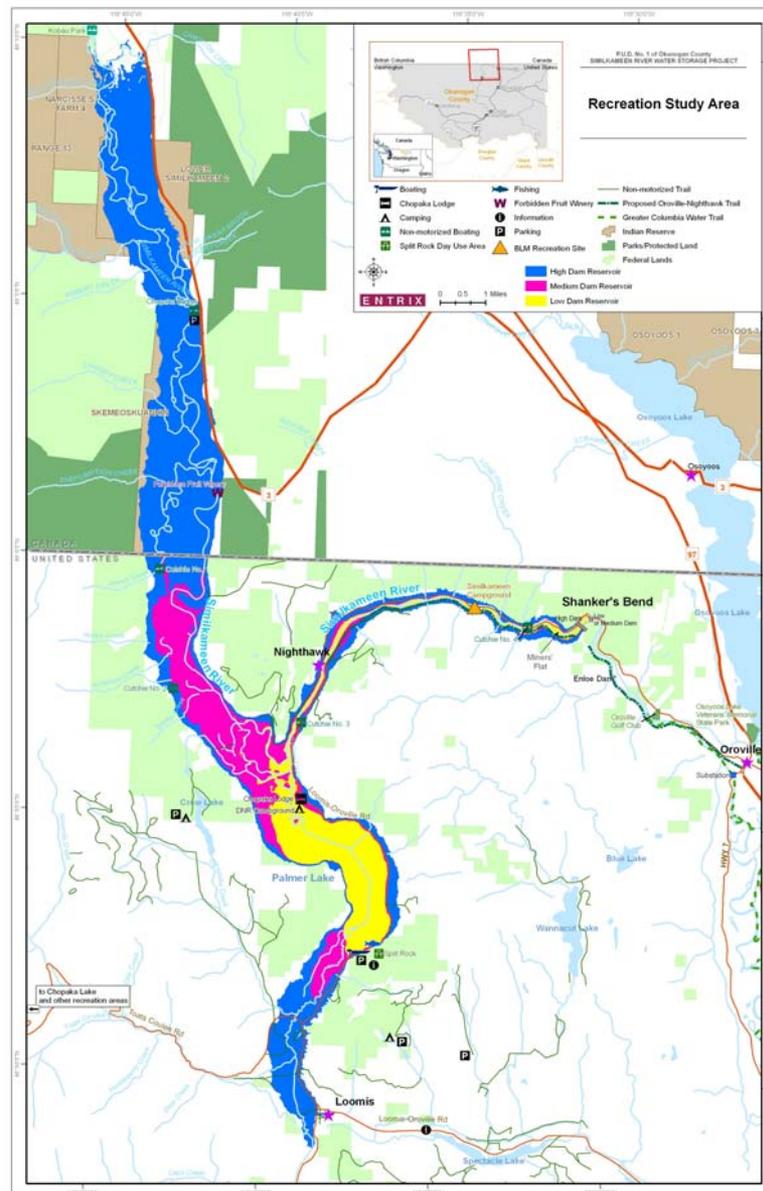
- Inundation of 6,717 acres priority riparian habitat in U.S.
- Inundation of 3,240 acres shrub-steppe/woodland habitat in U.S.
- Reduced habitat connectivity, both east-west and north-south
- Impacts to two provincial protected areas and a potential national grasslands park in Canada
- Major gain in open water habitat
- Loss of key white-tail and mule deer habitat
- Loss of 5 bald eagle nests
- Loss of 8,797 acres of cavity nesting duck habitat in US
- Loss of 1,844 acres of chukar habitat in US
- Impacts to ESA listed species: grizzly bear, gray wolf, lynx are improbable
- Possible impacts to 20 Canadian blue- and red- listed species
- Loss of big game and bird hunting, and wildlife watching opportunities
- Major gain in wildlife recreational opportunities if public access increases





# Recreation – High Dam Option

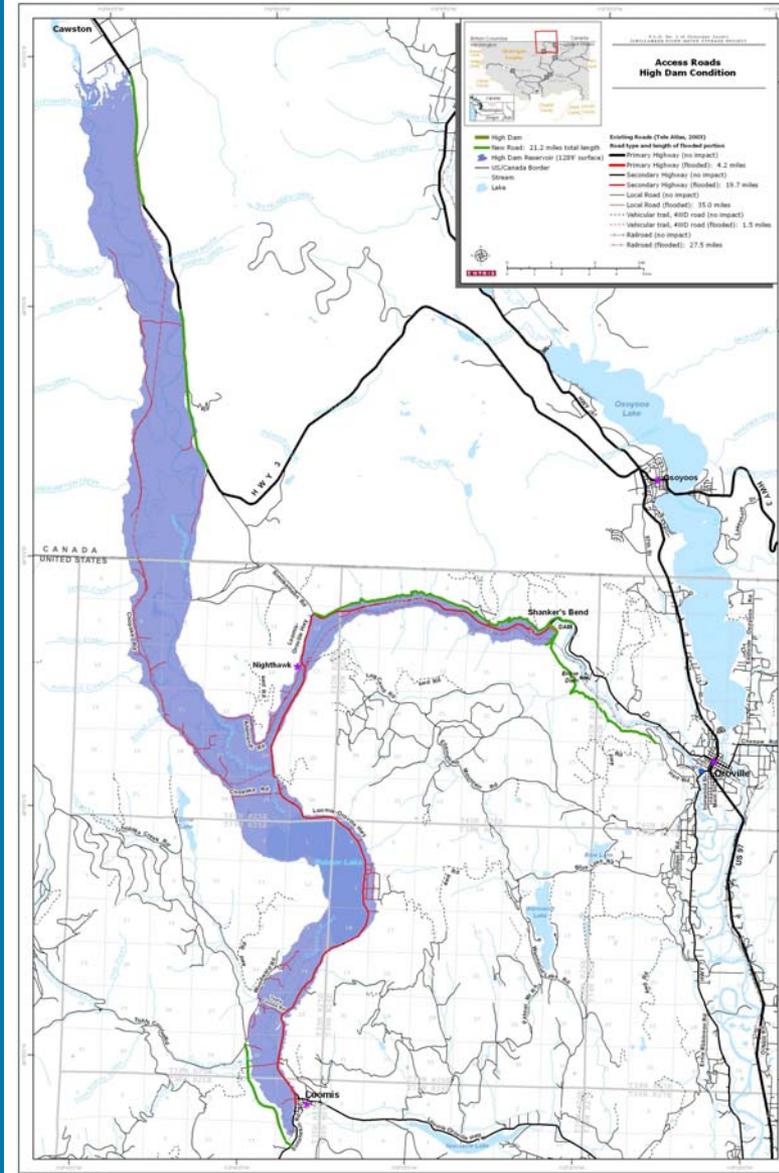
- Palmer Lake cabins and campsites inundated
- Some access routes to recreational uses inundated; others would be rebuilt
- Gold prospecting sites inundated
- Portions of the proposed Oroville-Nighthawk Trail inundated
- Inundation affects access to one winery in the Canadian Similkameen Valley, and might affect orchards and vineyards
- Increased opportunities for flat water recreation, including boat fishing, jet skiing and sailing offsets impacts to current largely dispersed, informal recreational use
- Substantial new shoreline creates new opportunities for shore fishing, sightseeing, camping and hunting, and new recreation related waterfront development
- The presence of a large body of water in an arid environment may enhance aesthetics for some observers, offsetting any loss of visual quality associated with the loss of riparian vegetation and areas exposed during draw-down periods





# Flooding – High Dam Option

- More than 12,000 acres of U.S. lands and structures inundated, valued at \$25.5M
- Stranded land parcels valued at: \$3.3M
- 8,995 acres of Canadian lands and structures inundated, valued at \$7.3M – \$16.7M (US\$)
- 46.6 miles of U.S. roads and 13.8 miles of Canadian roads inundated (primarily Hwy 3 in Canada and County Road 9425 (Loomis Orville Highway) in the U.S., partially replaced by 21.2 miles of new roads)
- Inundated US infrastructure: \$61.1 million
- Total value of inundated lands and infrastructure \$108M - \$117M





# Cultural Resources – High Dam Option

- 46 cultural and heritage resources would be affected
- High cultural importance sites that would be inundated include:
  - Traditional cultural properties
  - A burial site
  - 4 pictograph sites
  - 4 prehistoric housepits
  - Multiple historic structures
- In Canada, 2 Indian Lands Southeast of Keremeos would be impacted



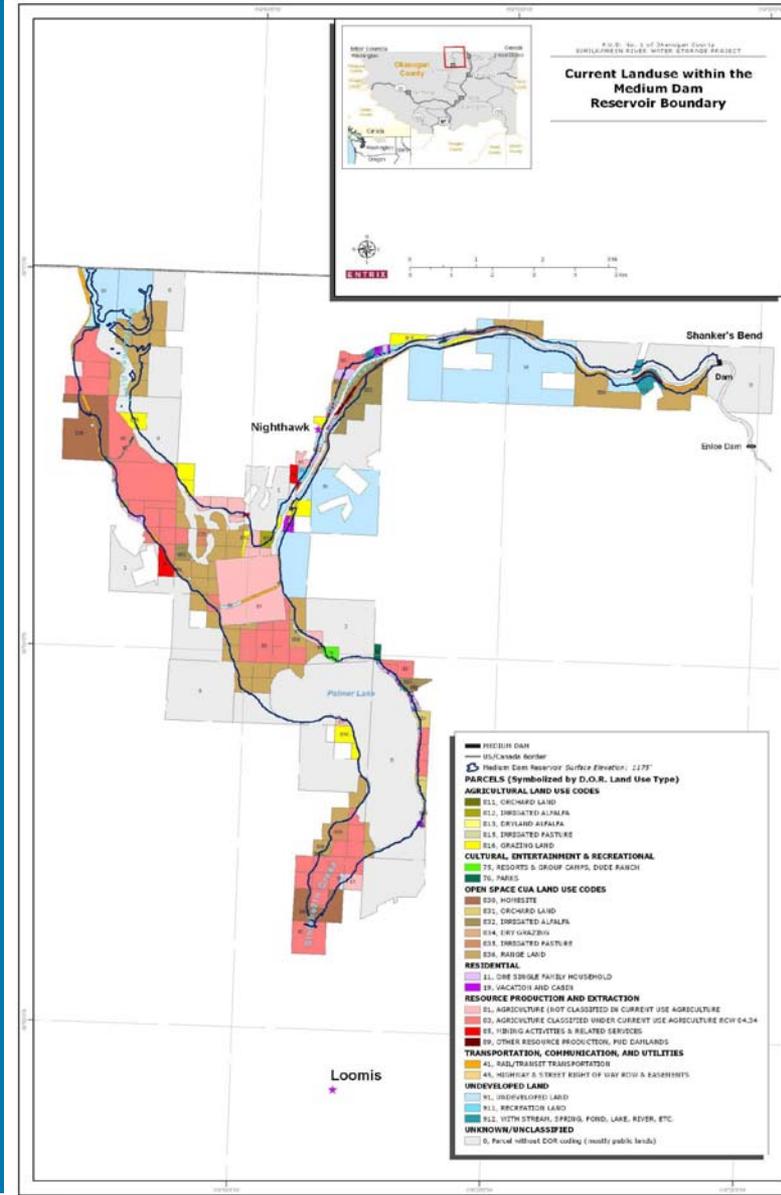
# Land Use – Medium Dam Option

## Access

- Access would be reduced to the west of the reservoir. New roads would be built to maintain critical access

## Acres Inundated

- *UNITED STATES:*
- Agriculture: 109 acres
- Open Space: 1483 acres
- Resource Production & Extraction: 2009 acres
- Residential: 70 acres
- Cultural, Entertainment & Recreational: 22 acres
- Transportation, Communication & Utilities: 91 acres
- Undeveloped Land: 247 acres
- Unclassified: 2985 acres





# Water Quality – Medium Dam Option

- Modeling would be required to establish the extent of potential green benefits from cool, oxygenated flow releases to benefit downstream anadromous fish and ameliorate existing problems
- Inundation of one mine has no expected effects on water quality
- Ability to provide 96% of minimum instream flow requirements throughout the year
- Potential to provide cold water releases downstream during summer
- Reduced turbidity downstream, benefiting salmonid spawning habitat
- Reduced spring and increased summer discharge
- Increased DO downstream



# Aquatic Resources – Medium Dam Option

- Modeling would be required to establish the extent of potential benefits from the release of cool, oxygenated flow releases to benefit downstream anadromous fish and other instream environmental values
- Minor negative impacts are largely limited to the inundation zone. Increased net productivity of aquatic life associated with an increase in available nutrients
- Potential to support downstream fisheries during the summer
- Potential to provide consistent instream flow during summer months
- Loss of 27,809 meters of mainstem fluvial habitat
- 24% increase in potential kokanee spawning habitat
- Potential increase in recreational fishing opportunities



# Terrestrial Resources – Medium Dam Option

## Wetlands:

- 939 acres Eastside (Interior) Riparian-Wetlands inundated
- 2,615 acres Herbaceous Wetlands inundated
- 228 acres Montane Coniferous Wetlands inundated
- Possible wetland development on new shoreline areas

## Wildlife:

- Inundation of 4,850 acres of priority riparian habitat
- Inundation of 449 acres of shrub-steppe/woodland habitat
- Reduction in habitat connectivity, both east-west and north-south
- Gain in open water habitat
- Loss of key white-tail and mule deer habitat
- Loss of 3 bald eagle nests
- Loss of 6,933 acres of cavity nesting duck habitat
- Loss of 486 acres of chukar habitat
- Impacts to ESA listed species: grizzly bear, gray wolf, lynx are improbable
- Minor loss of big game and bird hunting, and wildlife watching opportunities
- Gain in wildlife recreational opportunities if public access increases



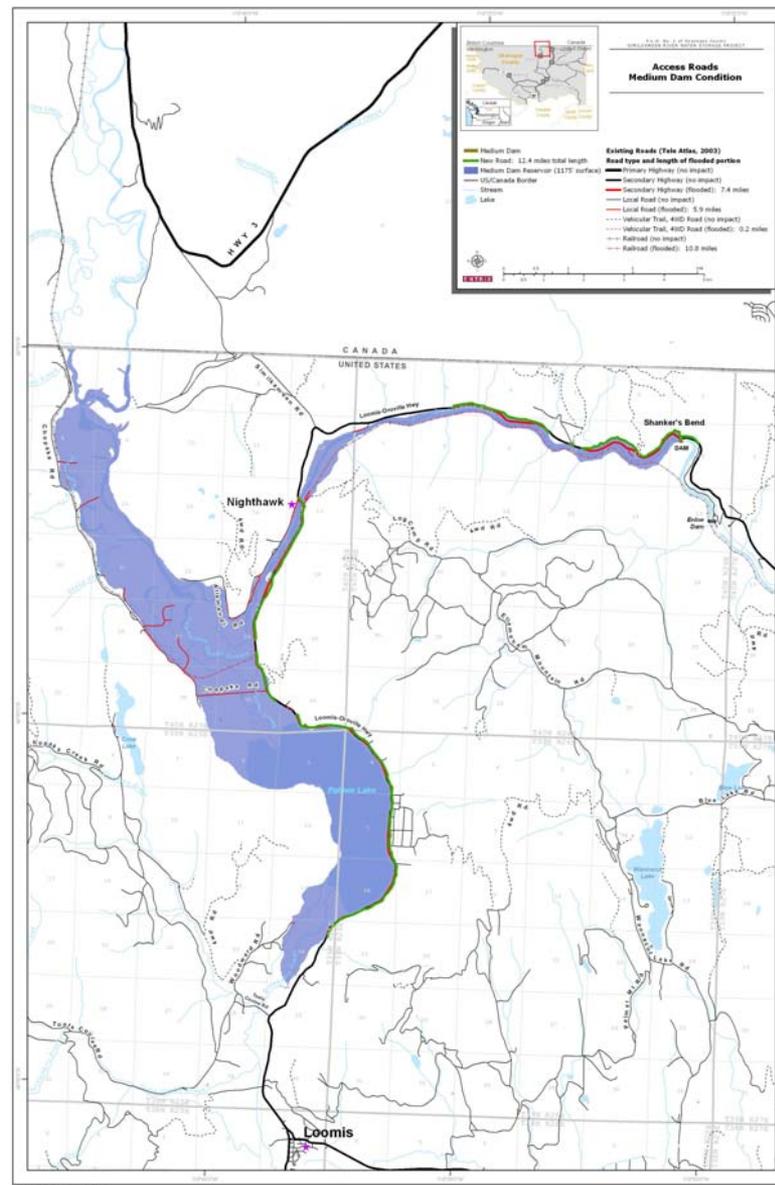
# Recreation – Medium Dam Option

- Some existing recreational facilities and sites would be inundated - primitive camp sites, cabins and recreational vehicle (RV) camping lots shore fishing areas
- Access routes to high elevation areas would be inundated - Iron Gate trailhead and for the Chopaka Mountain Wilderness Study Area (WSA)
- Gold prospecting sites would be inundated
- Increased opportunities for flat water recreation, including boat fishing, jet skiing and sailing offsets impacts to current largely dispersed, informal recreational use
- The new shoreline area would provide an opportunity for new recreation related waterfront development
- The expanded shoreline area would create new opportunities for shore fishing, sightseeing, camping and hunting
- The presence of an expanded body of water in an arid environment may enhance aesthetics for some observers, offsetting any loss of visual quality associated with the loss of riparian vegetation, impacts to habitat, and areas exposed during draw-down periods



# Flooding – Medium Dam Option

- No Canadian lands inundated
- 7,605 acres of U.S. lands and structures inundated, valued at \$13M
- Stranded land parcels valued at \$1.93M
- 13.5 miles of US roads inundated (County Road 9425 [Loomis Orville Highway]), partially replaced by 12.4 miles of new roads
- Inundated US infrastructure: \$24.2M
- Total value of lands and infrastructure: \$37.2M





# Cultural Resources – Medium Dam Option

- 24 historic resources would be affected
- Several known resources considered to be of medium to high cultural importance would be inundated, including:
  - Traditional Cultural Properties
  - 1 pictograph site
  - Multiple historic structures



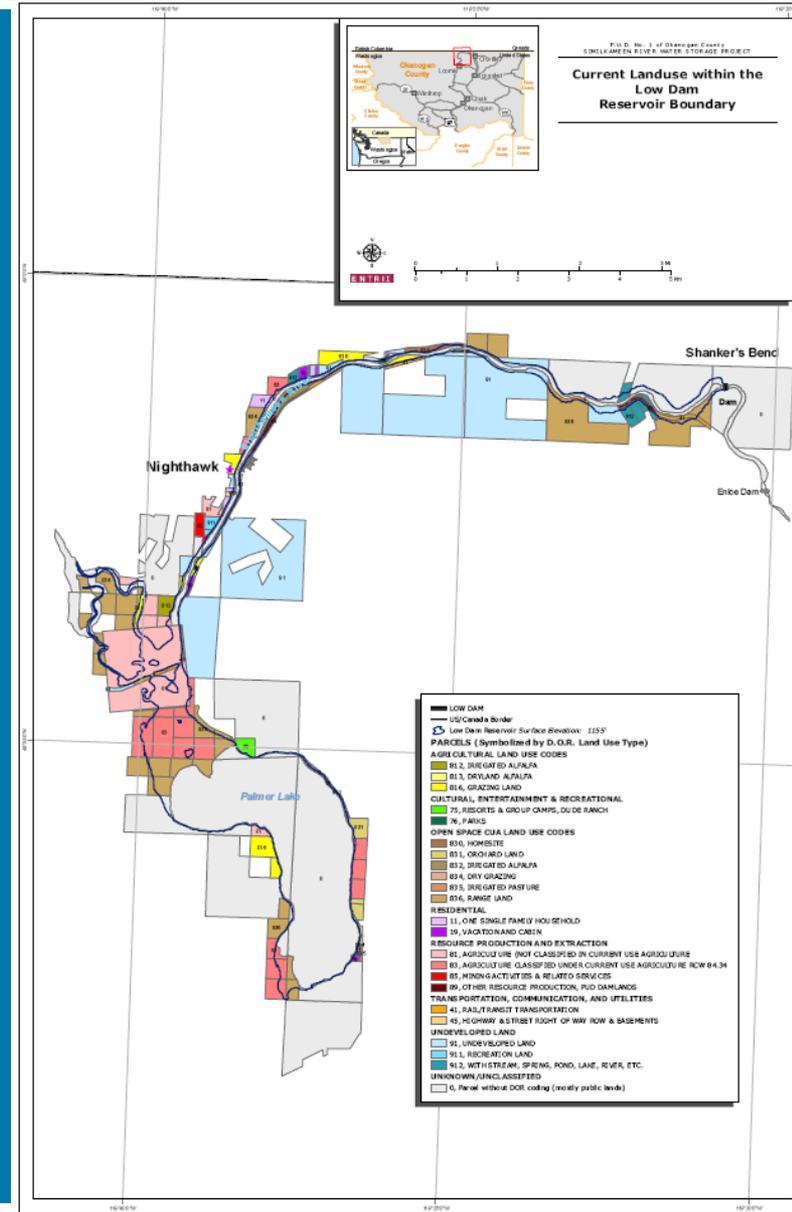
# Land Use – Low Dam Option

## Access

- Effects on access would be minimal. New roads would be built to maintain critical access.

## Acres Inundated

- *UNITED STATES:*
- Agriculture: 39 acres
- Open Space: 275 acres
- Resource Production & Extraction: 392 acres
- Residential: 26 acres
- Cultural, Entertainment & Recreational: 7 acres
- Transportation, Communication & Utilities: 35 acres
- Undeveloped Land: 97 acres
- Unclassified: 2483 acres





# Water Quality – Low Dam Option

- Modeling would be required to establish the extent of potential green benefits from cool, oxygenated flow releases to benefit downstream anadromous fish and ameliorate existing problems
- No mines would be inundated
- Ability to provide 92% of minimum instream flow requirements throughout the year
- Potential to provide cold water releases downstream during most of summer
- Reduced turbidity downstream, benefiting salmonid spawning habitat
- Reduced spring and increased summer discharge.
- Increased DO downstream



# Aquatic Resources – Low Dam Option

- Modeling would be required to establish the extent of potential benefits from the release of cool, oxygenated flow releases to benefit downstream anadromous fish and other instream environmental values.
- Minor negative impacts are largely limited to the inundation zone. Increased net productivity of aquatic life associated with an increase in available nutrients
- Loss of 17,567 meters of mainstem fluvial habitat
- 13% increase in potential kokanee spawning habitat
- Potential increase in recreational fishing opportunities



# Terrestrial Resources – Low Dam Option

## Wetlands:

- 221 acres Eastside (Interior) Riparian-Wetlands inundated
- 497 acres Herbaceous Wetlands inundated
- 140 acres Montane Coniferous Wetlands inundated
- Possible wetland development on new shoreline areas

## Wildlife:

- Inundation of 1,229 acres of priority riparian habitat
- Inundation of 210 acres of shrub-steppe/woodland habitat
- Gain in open water habitat
- Loss of key white-tail and mule deer habitat
- Loss of 1 bald eagle nest.
- Loss of 3,291 acres of cavity nesting duck habitat
- Loss of 229 acres of chukar habitat
- Impacts to ESA listed species: grizzly bear, gray wolf, lynx are improbable
- Minor loss of big game and bird hunting, and wildlife watching opportunities
- Minor gain to wildlife recreational opportunities if public access increases



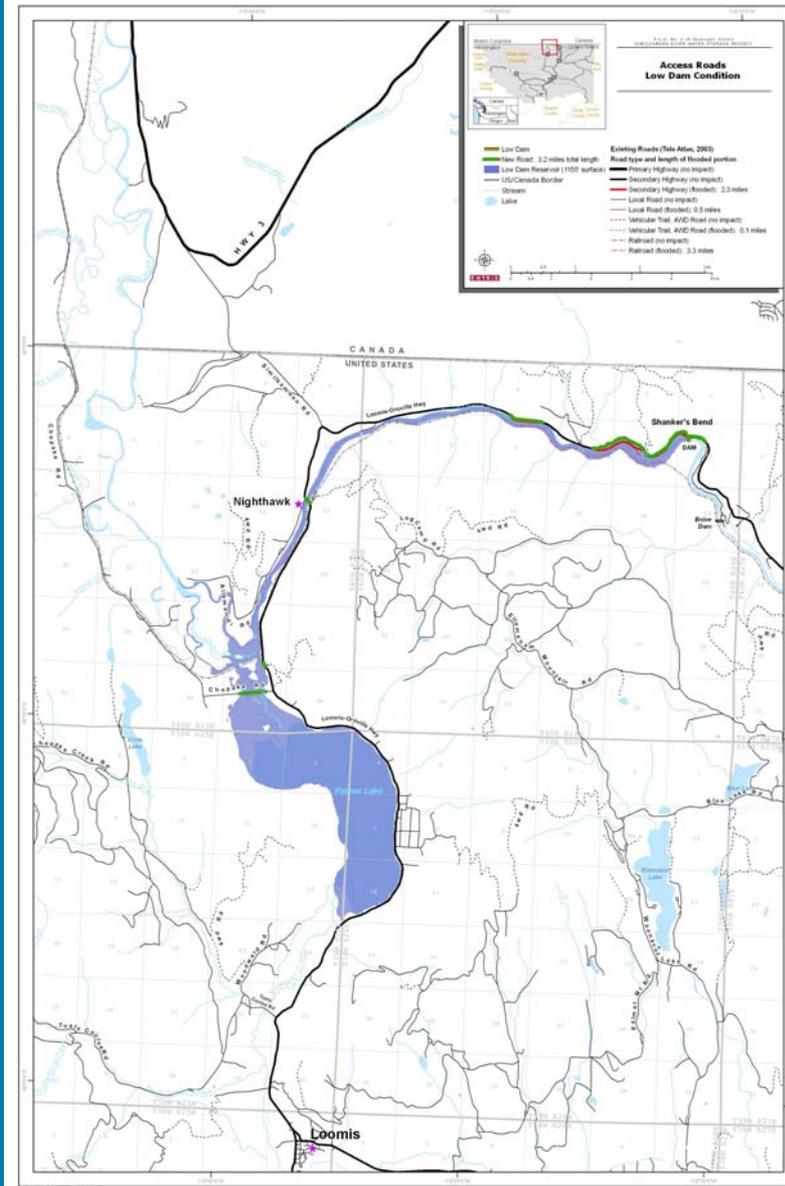
## Recreation – Low Dam Option

- Some existing recreational facilities and sites would be partially inundated -primitive camp sites, cabins and recreational vehicle (RV) camping lots shore fishing areas - but access would be unaffected
- Gold prospecting sites would be inundated
- Inundation would enhance canoe and kayak access to some waterways and would create small amounts of new flat water for boat fishing, power boating, jet skiing, offsets impacts to current largely dispersed, informal recreational use
- The creation of some new shoreline areas would provide a small enhancement for shore fishing, sightseeing, camping and hunting
- The slightly expanded body of water in the area around Palmer Lake may enhance aesthetics for some viewers, offsetting any loss of visual quality associated with loss of riparian vegetation, impacts to habitat, and areas exposed during draw-down periods



# Flooding – Low Dam Option

- More than 3,500 acres of U.S. lands and structures inundated, valued at \$5M
- 2.9 miles of US roads inundated (primarily County Road 9425 [Loomis Orville Highway]), partially replaced by 3.2 miles of new roads
- Inundated US infrastructure: \$5.7M
- Total value of inundated lands and infrastructure: \$10.7M





## Cultural Resources – Low Dam Option

- 16 historic resources would be affected
- Other than Traditional Cultural Properties in the area, the resources affected by this option are considered primarily of low to medium significance



# FERC Status

- Preliminary Permit Application (May 17, 2007)
- FERC Notice of Application (August 14, 2007)
- Preliminary Permit (December 18, 2008)

