



Syilx Okanagan Flood and Debris Flow Risk Assessment Map Book

Map Series 6 of 7: Economy Indicator



31 December 2019



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Acknowledgement

The *Syilx* Okanagan Flood and Debris Flow Risk Assessment is made possible by the many *Syilx* Okanagan Nation members from across the territory who generously contributed their input, knowledge, and lived experience – all of which form the foundations of this Assessment. Special recognition is given to the *Syilx* Okanagan traditional knowledge keepers and Elders who led the watershed tours and were a guiding force in rooting the assessment in traditional *Syilx* Okanagan perspectives.

This Assessment is a testament to the power of collaboration and partnership between *Syilx* and non-*Syilx* organizations, including the project team at Ebbwater Consulting Inc. (Ebbwater), and exhibits a shared concern for how water is managed and recognized in the territory.

Support for this project came from Emergency Management British Columbia (EMBC) and Public Safety Canada (PSC) as part of the National Disaster Mitigation Program (NDMP), First Nation Adapt Program and the Real Estate Foundation of B.C. through successful applications submitted by the Okanagan Nation Alliance (ONA).

Okanagan Nation Alliance would like to acknowledge Ebbwater for the production of this Map Book, which was completed by Dickon Wells, M. Eng, with support from Silja Hund, Ph.D., Nikoletta Stamatatou, M.Sc., and Robert Larson, M.Sc. Qualitative input for the Map Book is owed to project participants, as well as Erica Crawford (SHIFT Collaborative) and Kelly Terbasket (indigenEYEZ) for leading the workshops. Cory McGregor, GIT and Derek Cronmiller, P.Geo (both of Palmer Environmental Consulting Group) provided the information to quantitatively map debris flow hazard. The Map Book contains significant input from ONA team members Tessa Terbasket, Kathy Holland, and Skyeler Folks. The Map Book was reviewed by Tamsin Lyle, P.Eng of Ebbwater.

The team is grateful to *Syilx* Okanagan community staff who contributed to and supported the process; Colleen Marchand (OKIB), Brody Armstrong (PIB), Stephanie Paul (WFN), Jonathan Ford (WFN), Wendy Hawkes (LSIB), Trudy Peterson (LSIB), Mike Allison (USIB) and Robin Irwin (USIB). Finally, the team would like to thank the *Syilx* Okanagan Flood Adaptation Initiative Steering Committee members who will continue to work together and provide direction to co-build flood resilience in the region.

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Introduction

The ONA was a successful Stream 1 applicant to the National Disaster Mitigation Program (NDMP) to study flood and debris flow hazard risk in the Okanagan-Similkameen region. This project is the initial phase of a multi-year flood and debris flow adaptation initiative. This project's goal is to **understand the risk due to flood and debris flows within the project area, to support priority-setting of future work.**

This Map Book is one of four outputs that form the risk assessment component of this project (Figure 1). The Map Book may also be used as the main visual reference to the Synthesis and Recommendations report, for readers to obtain a summary understanding of the project. The Qualitative, Quantitative, and Basis of, studies contain more detailed information. The Map Book summarizes the spatial results following the methods described in the Qualitative and Quantitative Studies.

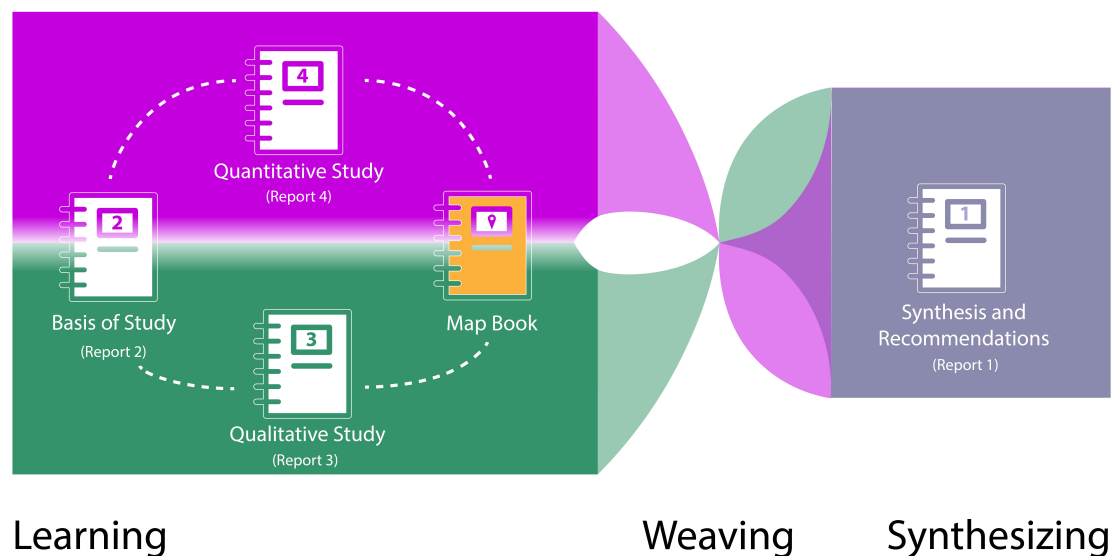


Figure 1: Project reporting diagram, with the Risk Assessment's four distinct outputs (i.e., Map Book, Basis of Study, and the complementary Qualitative and Quantitative studies).

Overview of Maps

We assessed the impacts from both flood and debris flow in the Okanagan-Similkameen Watersheds. This assessment was done quantitatively and qualitatively. This map series is one out of a series of 7 that together form the Map Book. In aggregate, the 7 series cover the 2 hazards assessed and 6 consequence indicators. The table below lists the 7 series, and highlights the series contained herein. The qualitative maps combine impacts from both flood and debris flow hazards. The quantitative maps show consequences from flood and debris flow hazards separately. In the quantitative maps, the consequences for flood hazard are shown for the moderate magnitude scenario only.

Series	Map Book Title	Information Shown
Series 1	Flood and Debris Flow Hazard	<ul style="list-style-type: none">• Debris Flow• Low, Moderate, and High Magnitude Flood
Series 2	Environment Indicator	<ul style="list-style-type: none">• Qualitative (Impacts)• Quantitative (Consequences)
Series 3	Culture Indicator	<ul style="list-style-type: none">• Qualitative (Impacts)• Quantitative (Consequences)
Series 4	Mortality Indicator	<ul style="list-style-type: none">• Quantitative (Consequences)
Series 5	Affected People Indicator	<ul style="list-style-type: none">• Qualitative (Impacts)• Quantitative (Consequences)
Series 6	Economy Indicator	<ul style="list-style-type: none">• Qualitative (Impacts)• Quantitative (Consequences)
Series 7	Disruption Indicator	<ul style="list-style-type: none">• Qualitative (Impacts)• Quantitative (Consequences)

Printing and Document Navigation

All maps are designed and scaled to be printed in 'ANSI D' format. Maps are linked and can be navigated in clicking within the following:

- Index line items on page 3.
- Blue tiles, watersheds or text, in the top right-hand corner of the maps, where present.
- Sub-watershed index maps on pages 12 and 37.
- Hyperlinked Map index on page 7.

Notes to User

Qualitative

1. Impacts were recorded primarily in Workshop 1 in West Kelowna on 13 February 2019 and Workshop 2 on 25 April 2019. Impacts were also recorded based on input obtained from learning sessions, watershed tours, personal communications and electronic feedback.
2. Methodologies and impacts are discussed further in the Qualitative Study which accompanies this Map Book.

Data Sources

1. Lakes, Watercourses, Roads, and Trails: BC Data Catalogue.
2. *Sylix* Place Names: Okanagan Nation Alliance.
3. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.











Quantitative

1. Land values are based on BC Assessment data using land parcels. The data are known to be incomplete, especially on reserve lands. The gap on reserve lands has been addressed by applying average property values to building footprints as a proxy.
2. The land values (exposure) layer was clipped to the moderate flood or debris flow hazard area. The hazard layer is shown in the hazard maps, and was produced by Ebbwater Consulting Inc. The method used to produce the hazard layer is described in the Quantitative Study.

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Icons

Information Type	
	Qualitative
	Quantitative
Hazard	
	Flood
	Debris Flow
Exposure Indicator	
	Environment
	Culture
	Mortality
	Affected People
	Economy
	Disruption

Map Index

Qualitative Maps

EC-Q-001-001	Qualitative Impacts - Economy - Project Area Map
EC-Q-001-002	Qualitative Impacts - Economy - Okanagan Map
EC-Q-001-003	Qualitative Impacts - Economy - Similkameen Map

Quantitative Maps

EC-F-001-001	Flood - Economy - Sub-watershed Index	EC-D-001-001	Debris Flow - Economy - Sub-watershed Index
EC-F-002-001	Flood - Economy - Quantitative Project Area Map	EC-D-002-001	Debris Flow - Economy - Quantitative Project Area Map
EC-F-002-002	Flood - Economy - Quantitative Okanagan Map	EC-D-002-002	Debris Flow - Economy - Quantitative Okanagan Map
EC-F-002-003	Flood - Economy - Quantitative Similkameen Map	EC-D-002-003	Debris Flow - Economy - Quantitative Similkameen Map
EC-F-003-001	Flood - Economy - Quantitative Map Tile 1 of 20	EC-D-003-001	Debris Flow - Economy - Quantitative Map Tile 1 of 20
EC-F-003-002	Flood - Economy - Quantitative Map Tile 2 of 20	EC-D-003-002	Debris Flow - Economy - Quantitative Map Tile 2 of 20
EC-F-003-003	Flood - Economy - Quantitative Map Tile 3 of 20	EC-D-003-003	Debris Flow - Economy - Quantitative Map Tile 3 of 20
EC-F-003-004	Flood - Economy - Quantitative Map Tile 4 of 20	EC-D-003-004	Debris Flow - Economy - Quantitative Map Tile 4 of 20
EC-F-003-005	Flood - Economy - Quantitative Map Tile 5 of 20	EC-D-003-005	Debris Flow - Economy - Quantitative Map Tile 5 of 20
EC-F-003-006	Flood - Economy - Quantitative Map Tile 6 of 20	EC-D-003-006	Debris Flow - Economy - Quantitative Map Tile 6 of 20
EC-F-003-007	Flood - Economy - Quantitative Map Tile 7 of 20	EC-D-003-007	Debris Flow - Economy - Quantitative Map Tile 7 of 20
EC-F-003-008	Flood - Economy - Quantitative Map Tile 8 of 20	EC-D-003-008	Debris Flow - Economy - Quantitative Map Tile 8 of 20
EC-F-003-009	Flood - Economy - Quantitative Map Tile 9 of 20	EC-D-003-009	Debris Flow - Economy - Quantitative Map Tile 9 of 20
EC-F-003-010	Flood - Economy - Quantitative Map Tile 10 of 20	EC-D-003-010	Debris Flow - Economy - Quantitative Map Tile 10 of 20
EC-F-003-011	Flood - Economy - Quantitative Map Tile 11 of 20	EC-D-003-011	Debris Flow - Economy - Quantitative Map Tile 11 of 20
EC-F-003-012	Flood - Economy - Quantitative Map Tile 12 of 20	EC-D-003-012	Debris Flow - Economy - Quantitative Map Tile 12 of 20
EC-F-003-013	Flood - Economy - Quantitative Map Tile 13 of 20	EC-D-003-013	Debris Flow - Economy - Quantitative Map Tile 13 of 20
EC-F-003-014	Flood - Economy - Quantitative Map Tile 14 of 20	EC-D-003-014	Debris Flow - Economy - Quantitative Map Tile 14 of 20
EC-F-003-015	Flood - Economy - Quantitative Map Tile 15 of 20	EC-D-003-015	Debris Flow - Economy - Quantitative Map Tile 15 of 20
EC-F-003-016	Flood - Economy - Quantitative Map Tile 16 of 20	EC-D-003-016	Debris Flow - Economy - Quantitative Map Tile 16 of 20
EC-F-003-017	Flood - Economy - Quantitative Map Tile 17 of 20	EC-D-003-017	Debris Flow - Economy - Quantitative Map Tile 17 of 20
EC-F-003-018	Flood - Economy - Quantitative Map Tile 18 of 20	EC-D-003-018	Debris Flow - Economy - Quantitative Map Tile 18 of 20
EC-F-003-019	Flood - Economy - Quantitative Map Tile 19 of 20	EC-D-003-019	Debris Flow - Economy - Quantitative Map Tile 19 of 20
EC-F-003-020	Flood - Economy - Quantitative Map Tile 20 of 20	EC-D-003-020	Debris Flow - Economy - Quantitative Map Tile 20 of 20

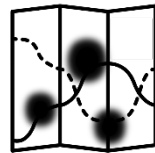
Sylix Okanagan Flood and Debris Flow Risk Assessment

Map Book

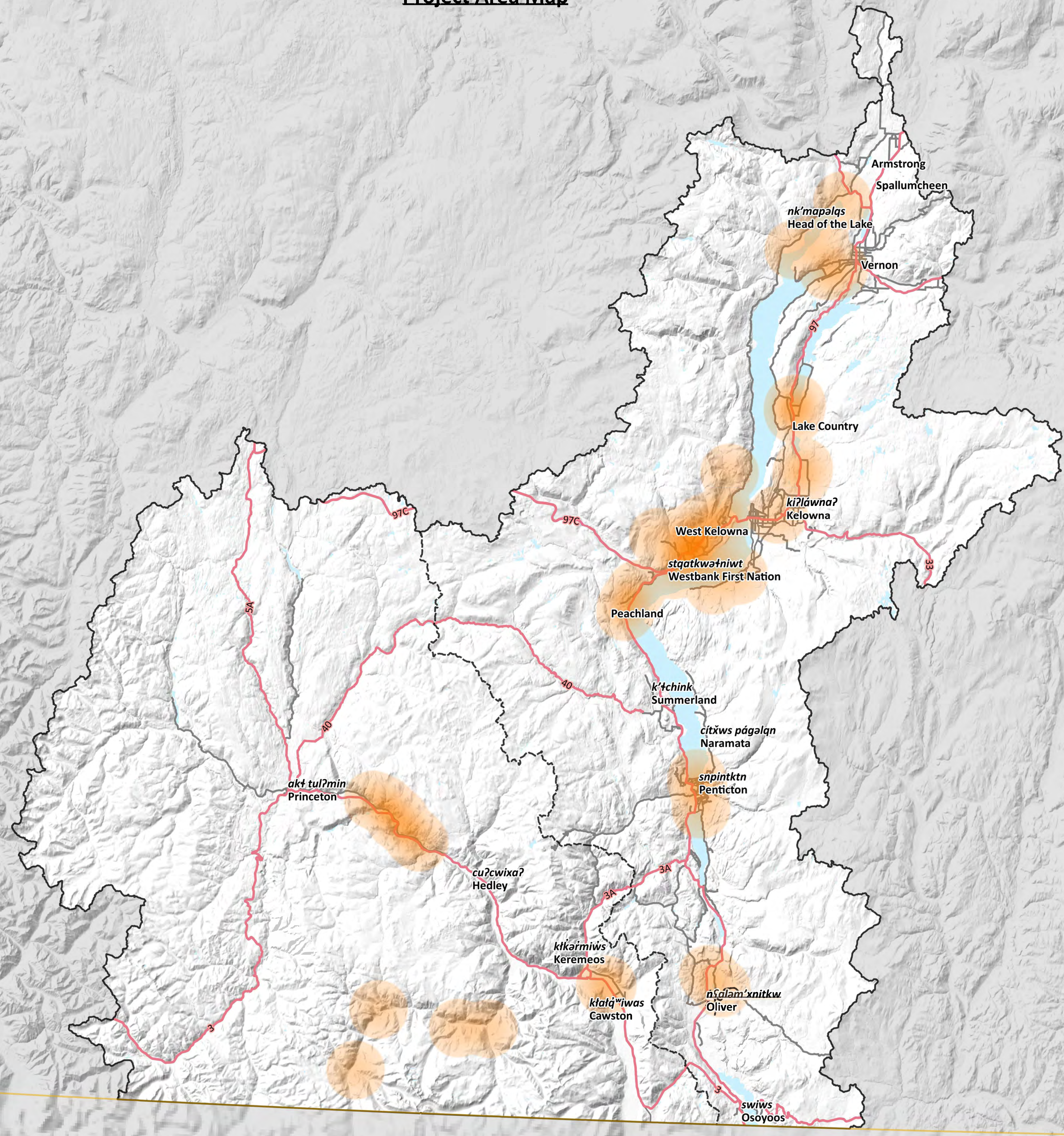
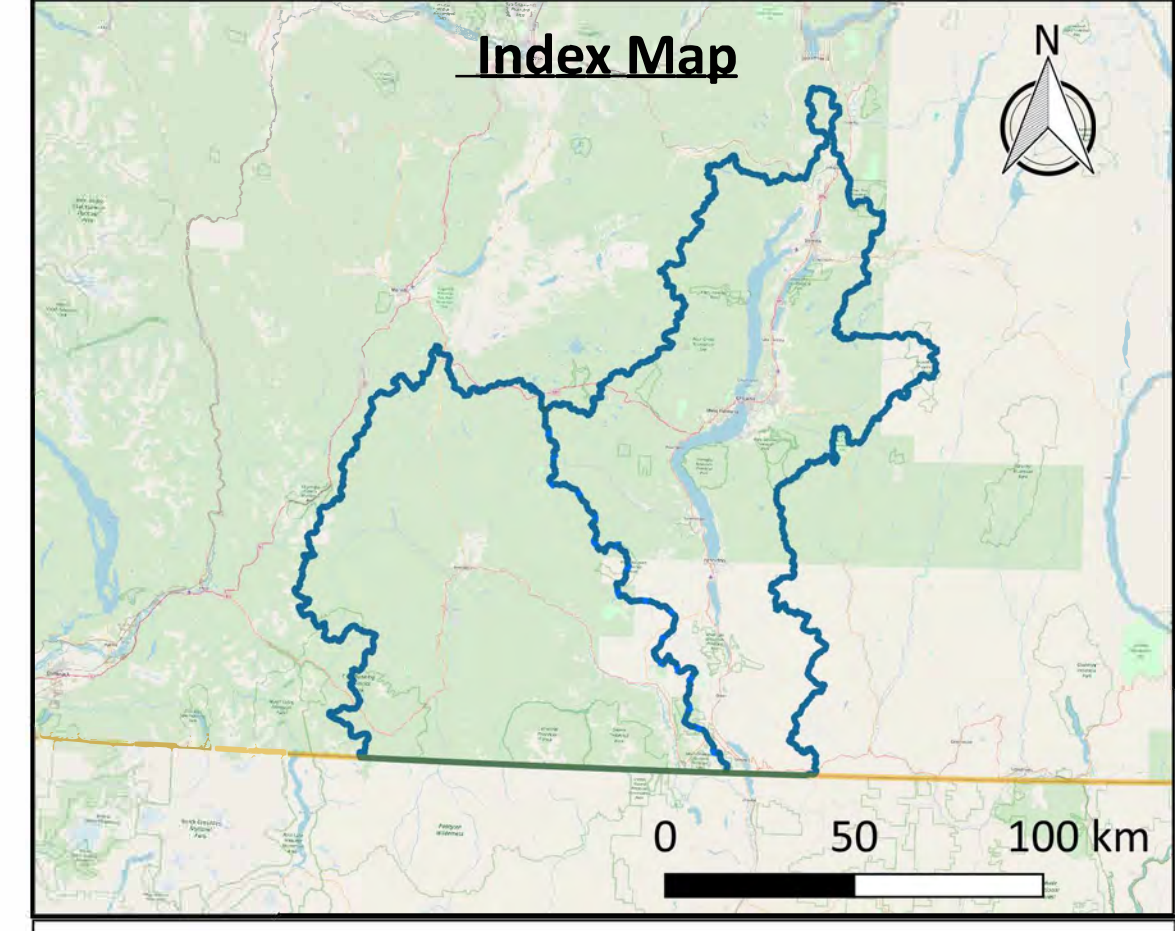
Map Series 6 of 7: Economy Indicator



Qualitative Flood and Debris Flow Impact Maps



Project Area Map



[Click here to go to Okanagan Map](#)
[Click here to go to Similkameen Map](#)

Map Notes
 1. Map created by Ebbwater Consulting Inc.
 2. Impacts were recorded primarily in Workshop 1 in West Kelowna on 13 February 2019 and Workshop 2 on 25 April 2019. Impacts were also recorded based on input obtained from learning sessions, watershed tours, personal communications and electronic feedback.
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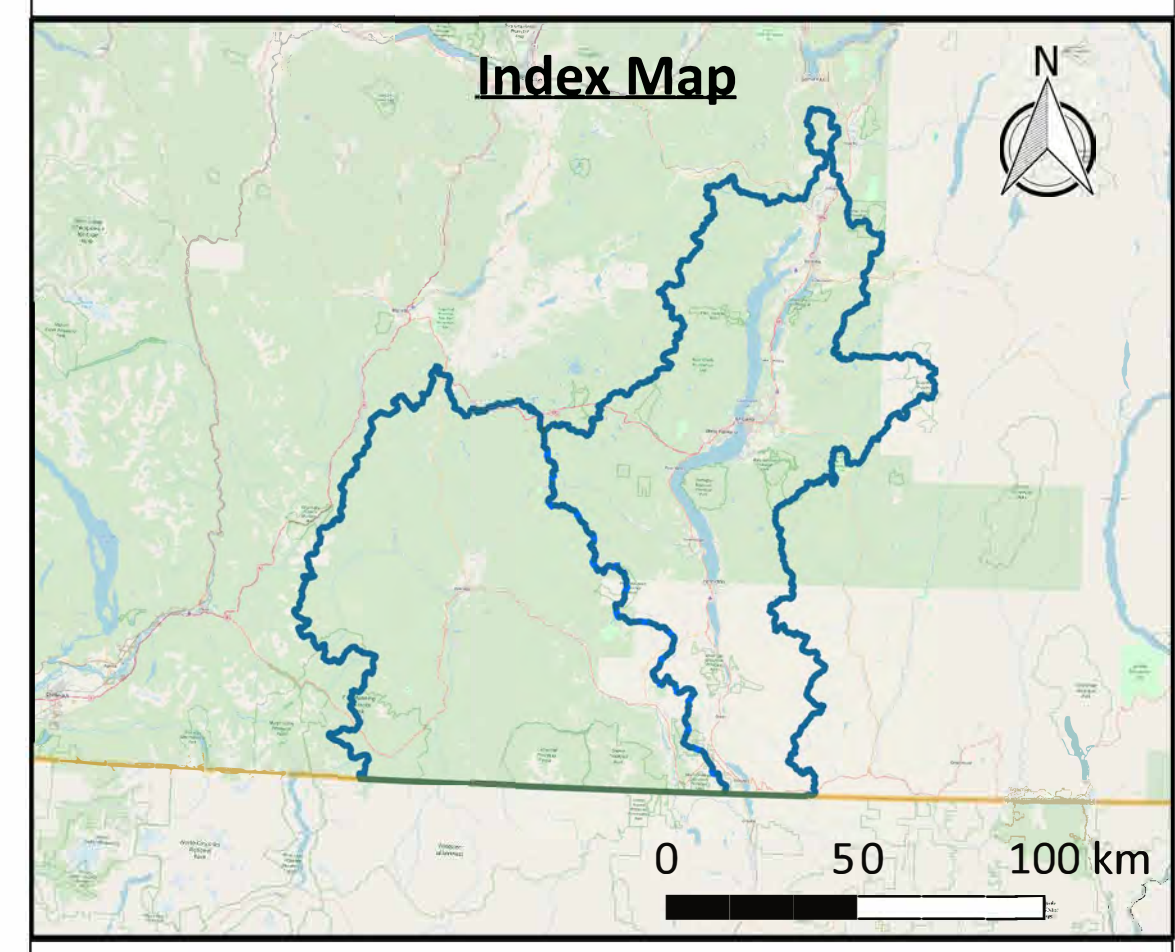
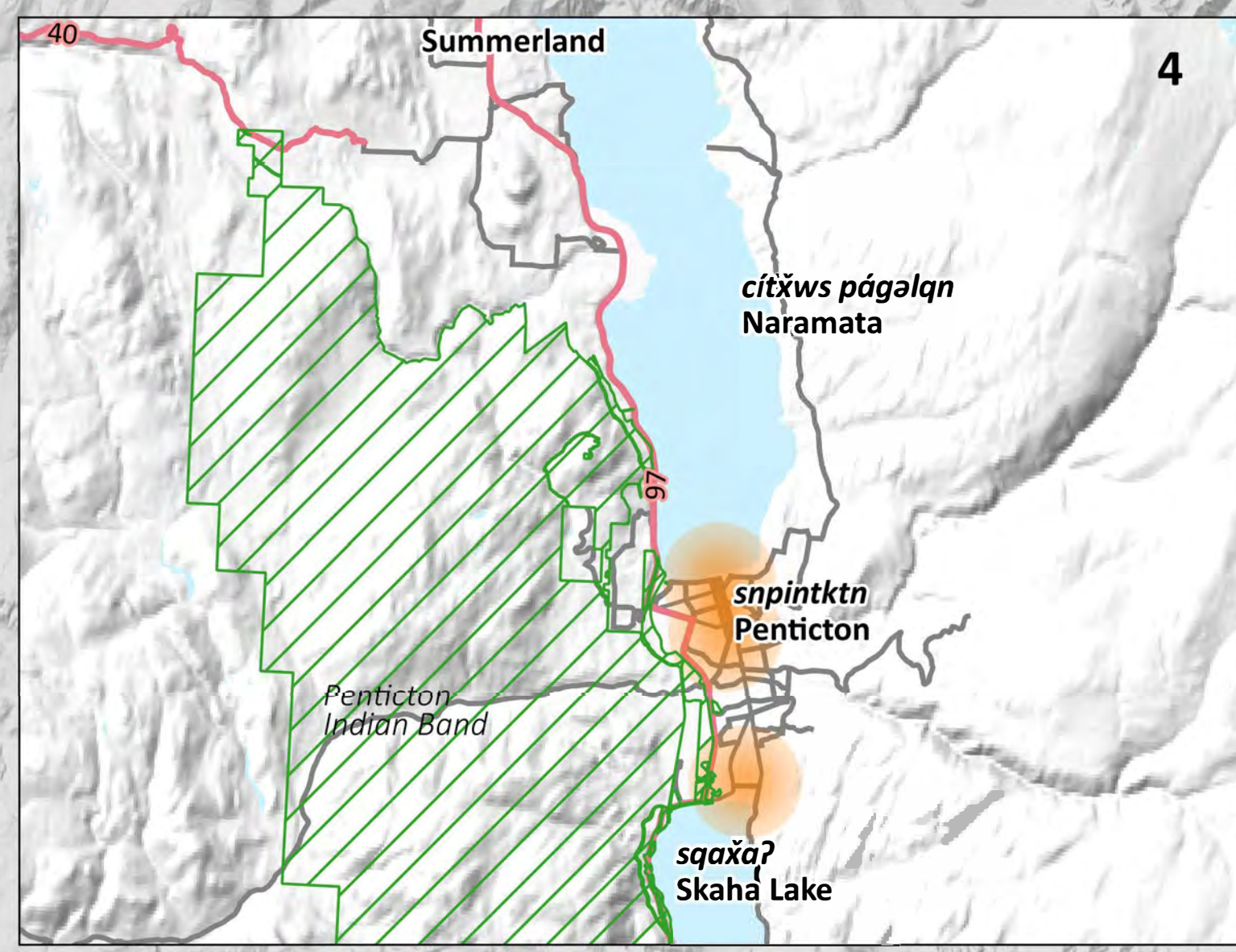
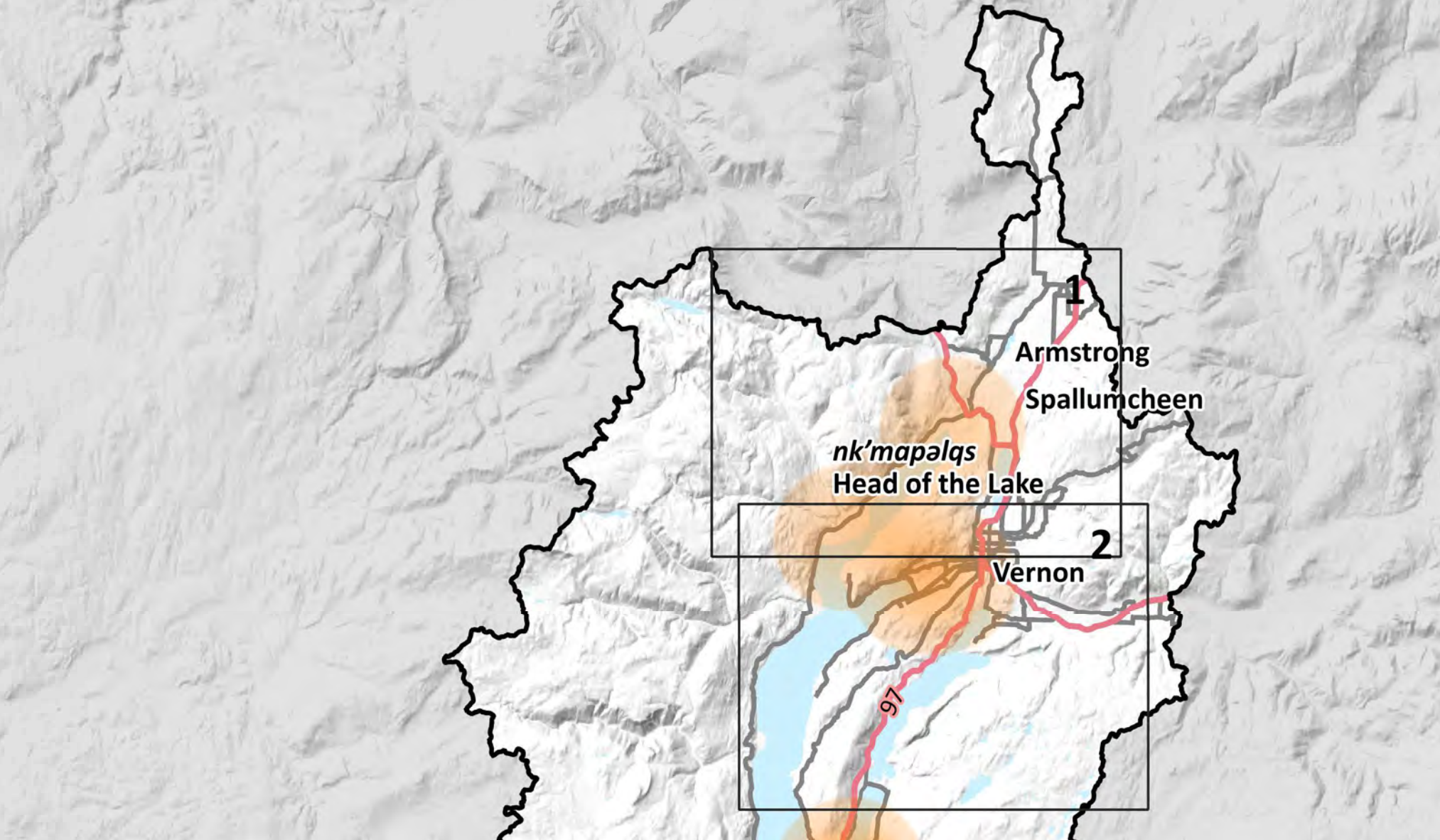
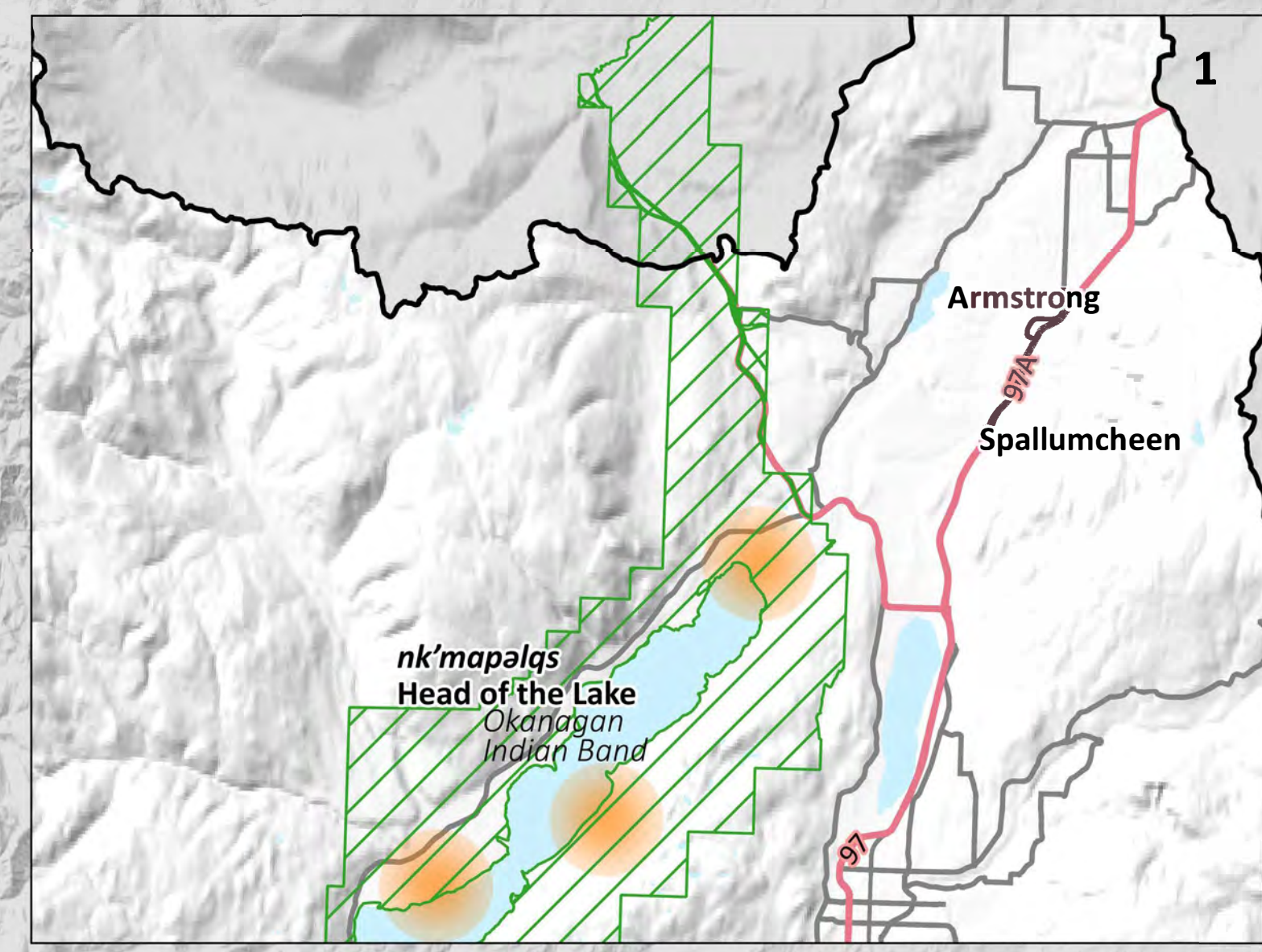
Legend

	Background		Economic Impacts
	Watershed Boundary		
	Okanagan-Similkameen Boundary		
	Canada - US Border		
	Lakes		
	Watercourses		
	Highway		
	Major Road		
	Reserves		

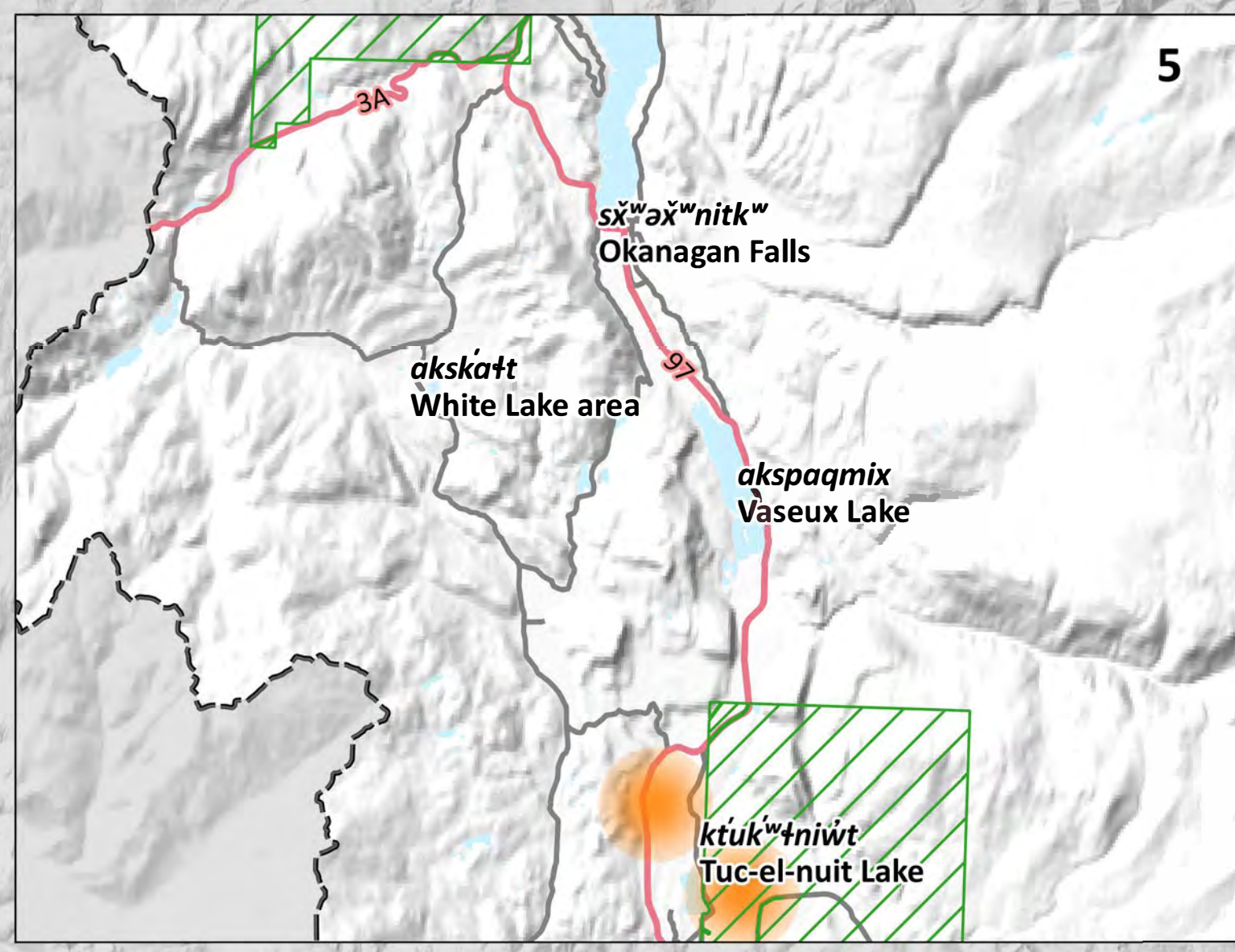
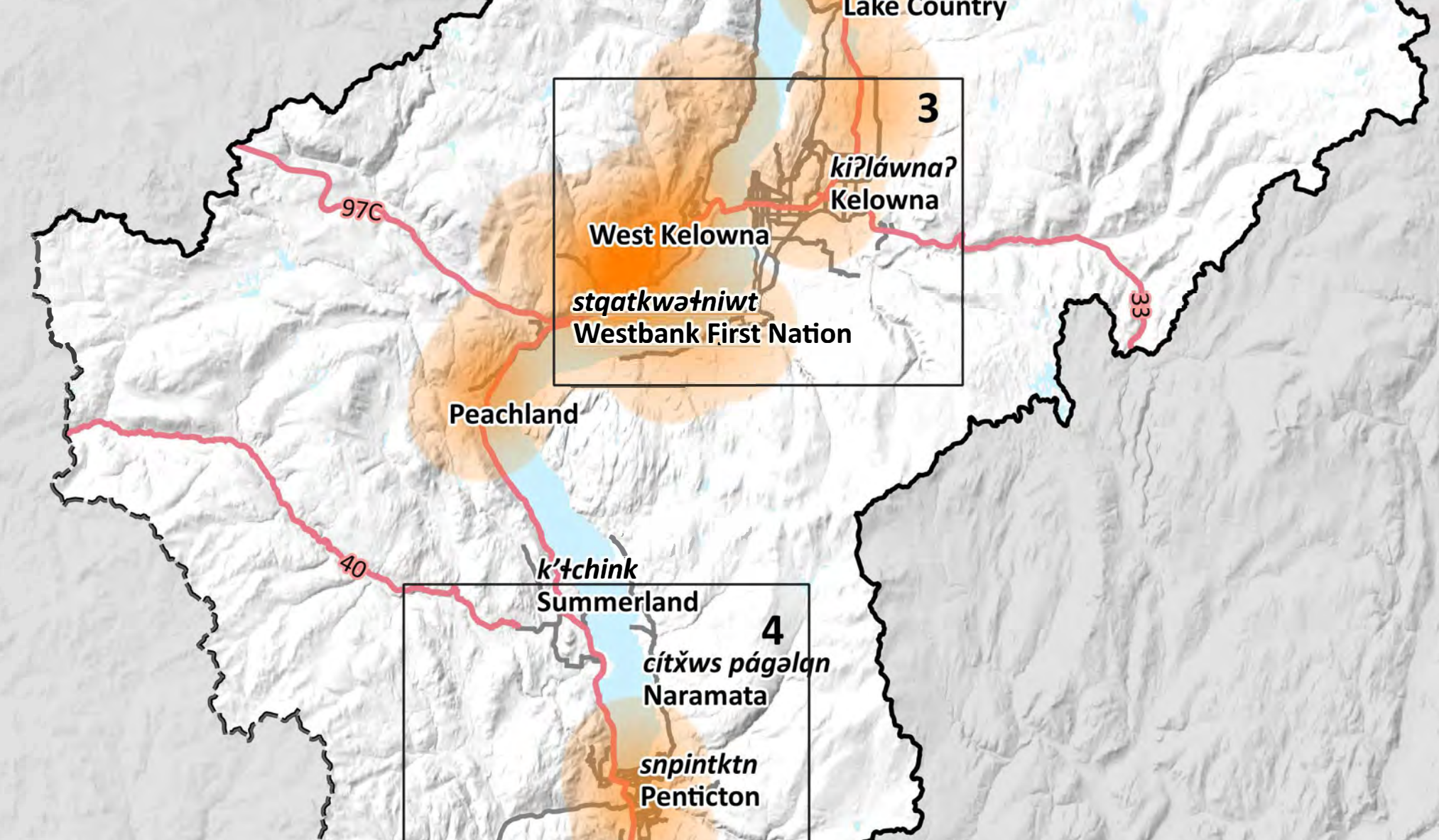
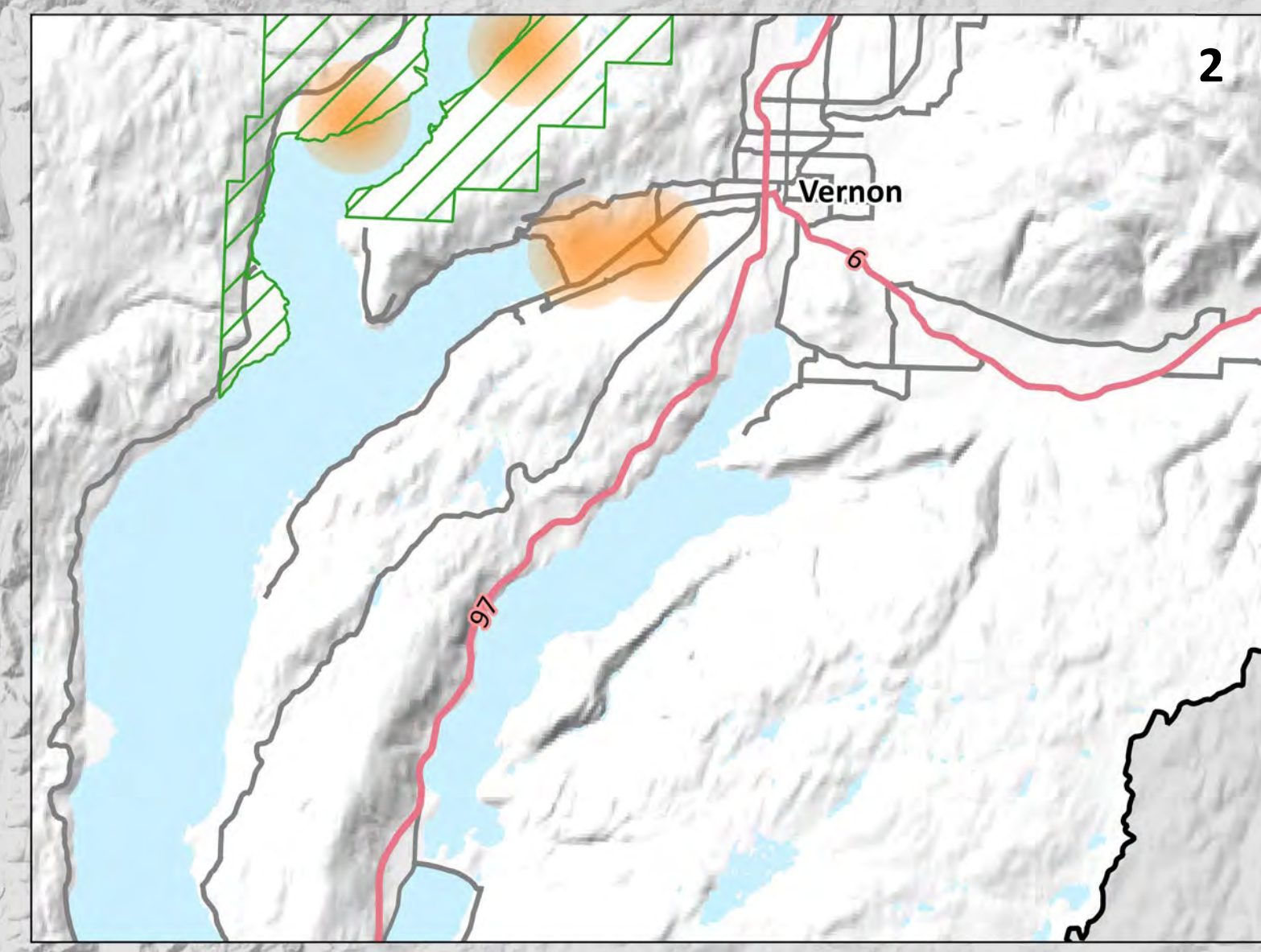
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Qualitative Impacts - Economy - Project Area

Okanagan Map

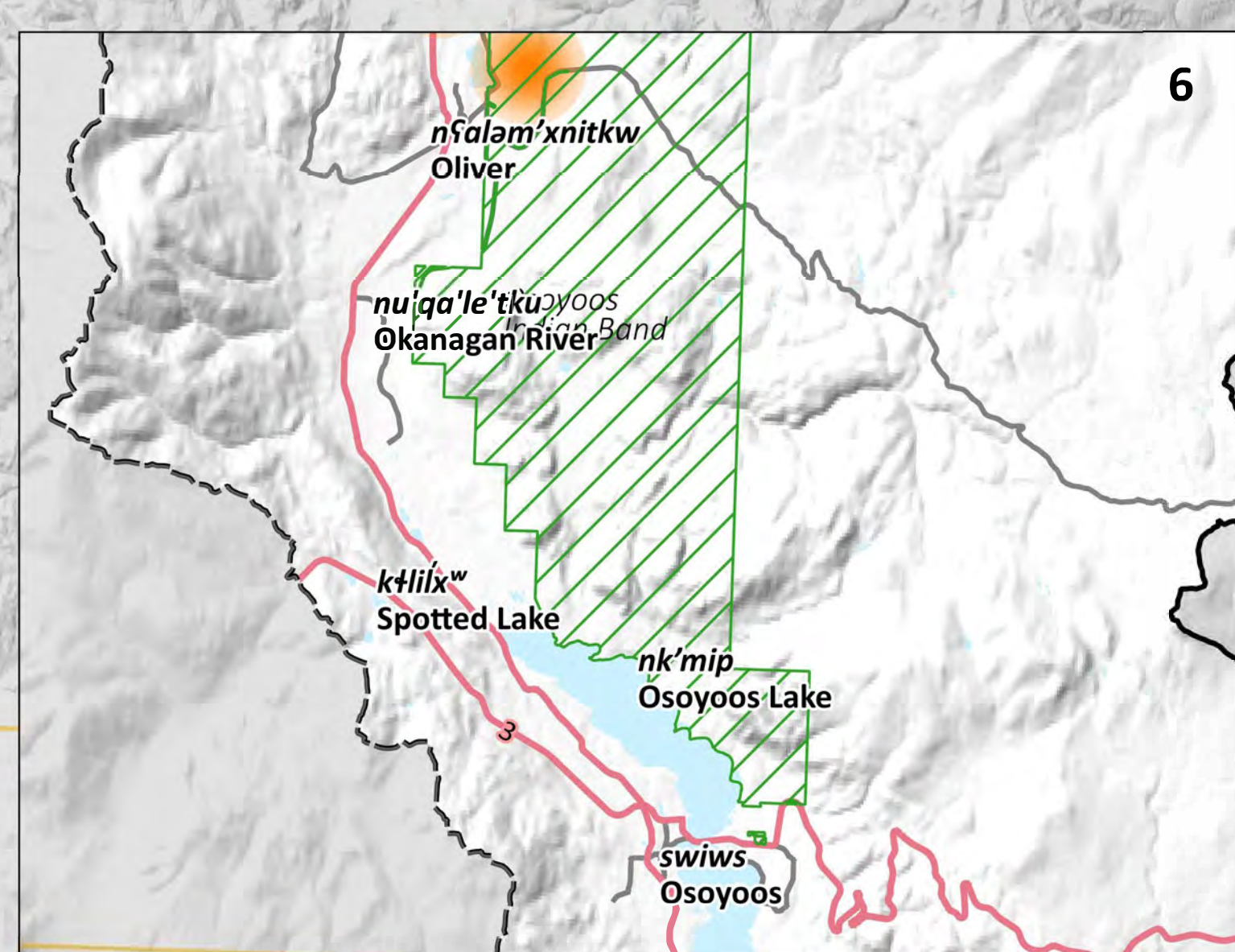
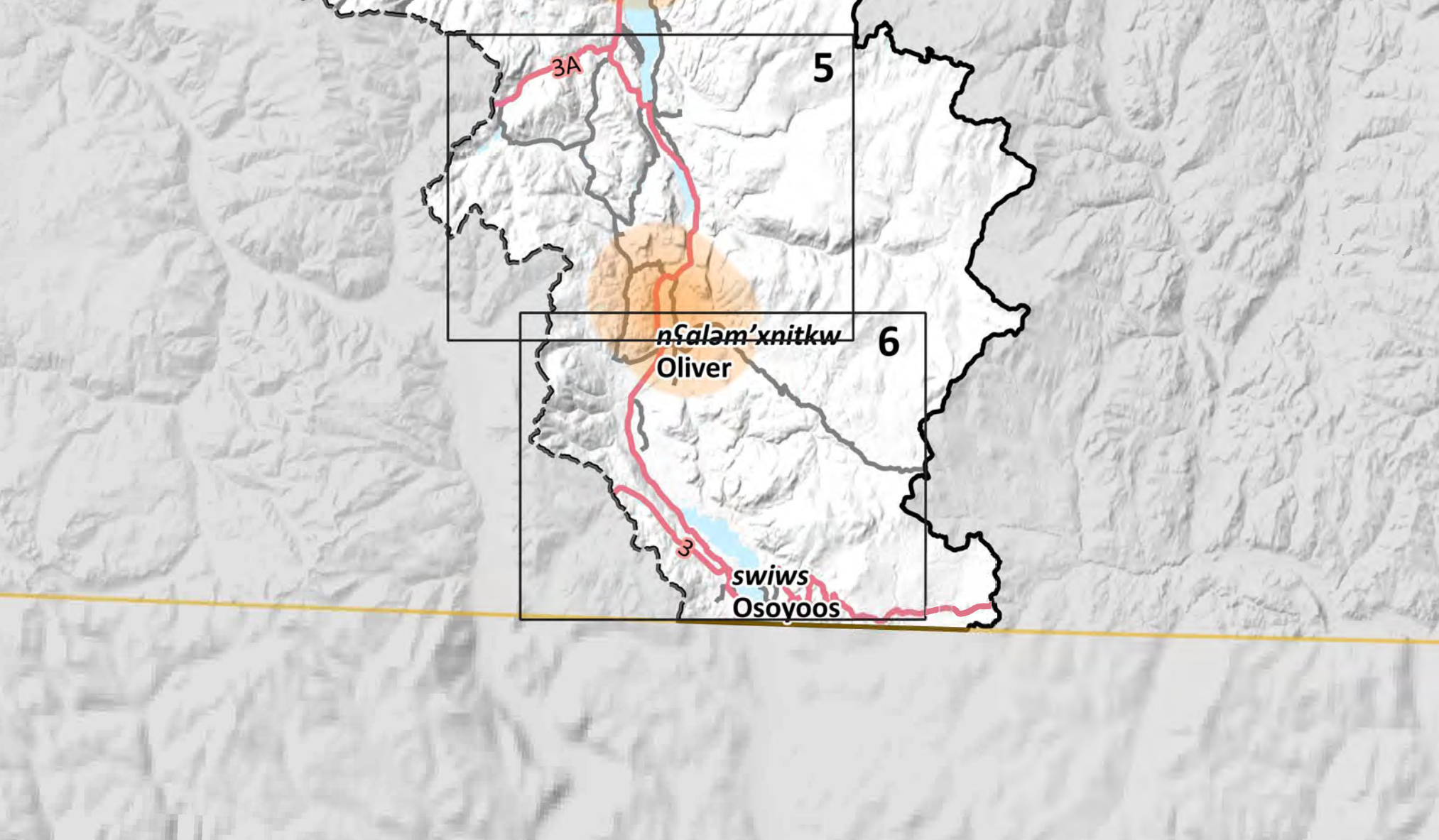
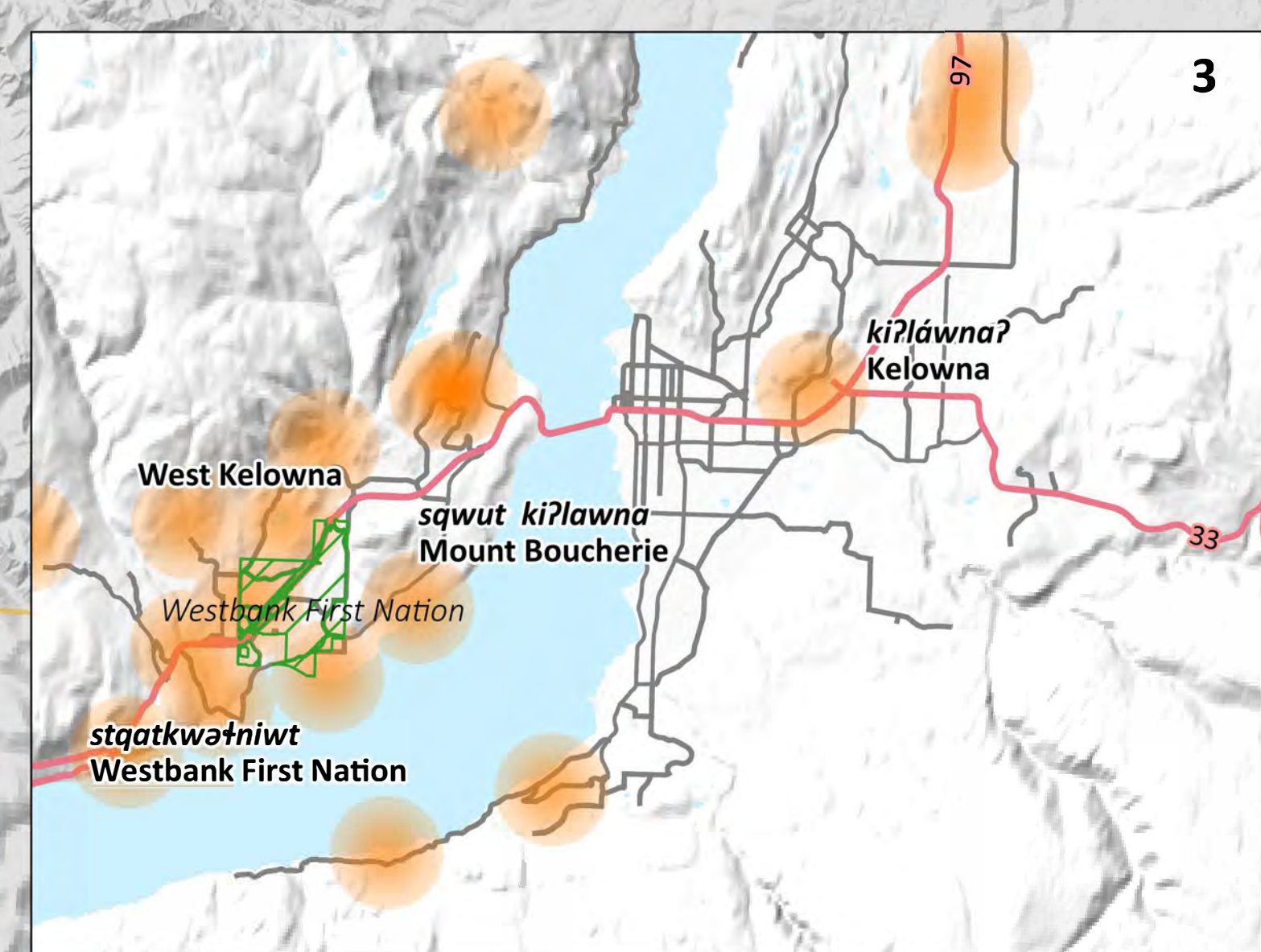
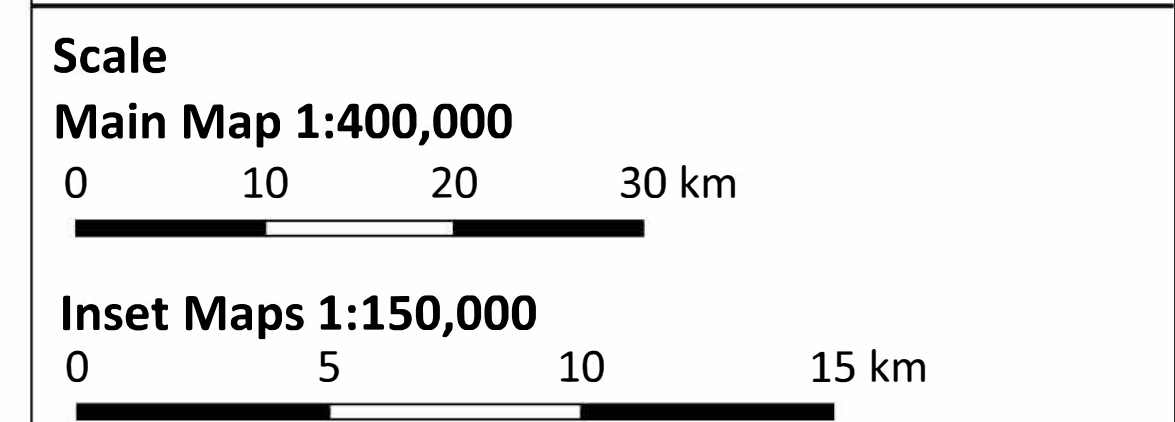


[Click here to go to Project Area Map](#)
[Click here to go to Similkameen Map](#)



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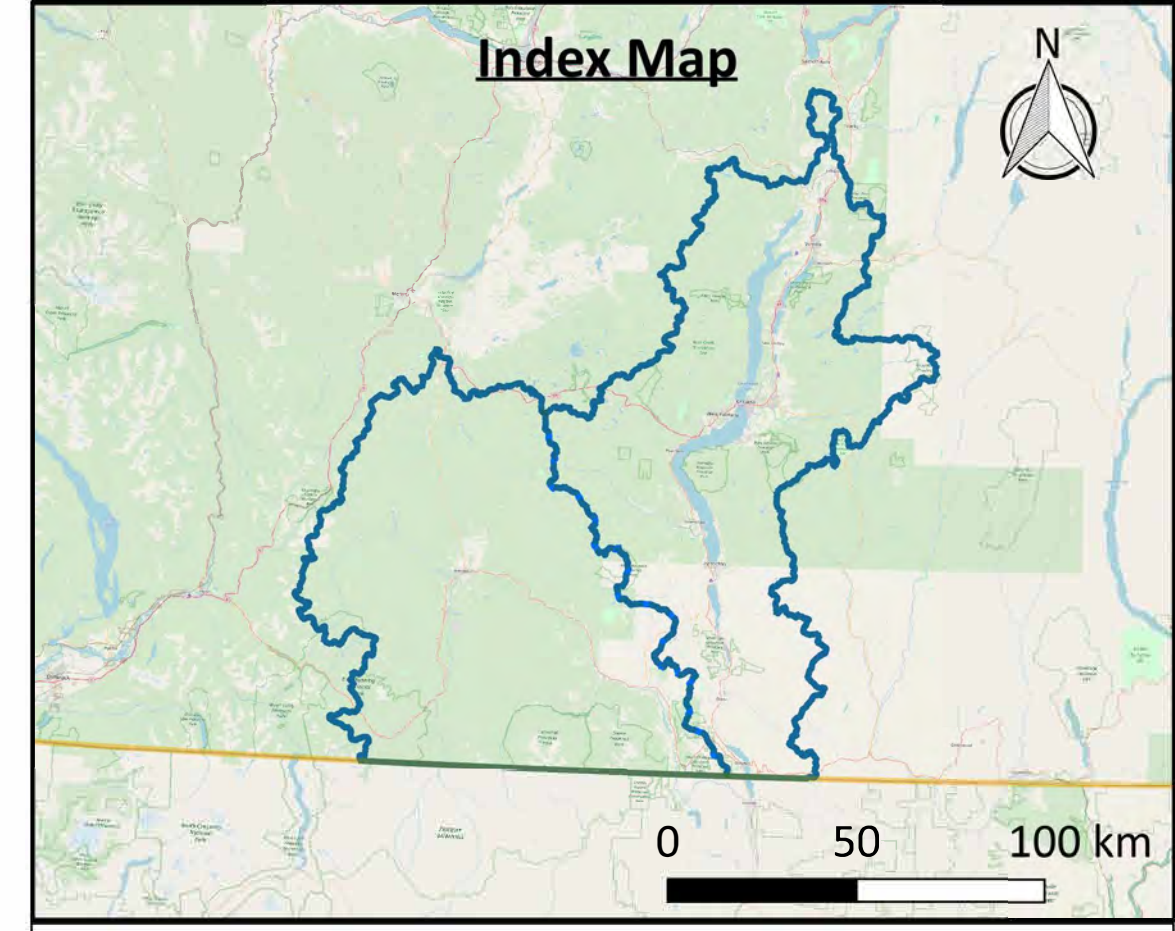
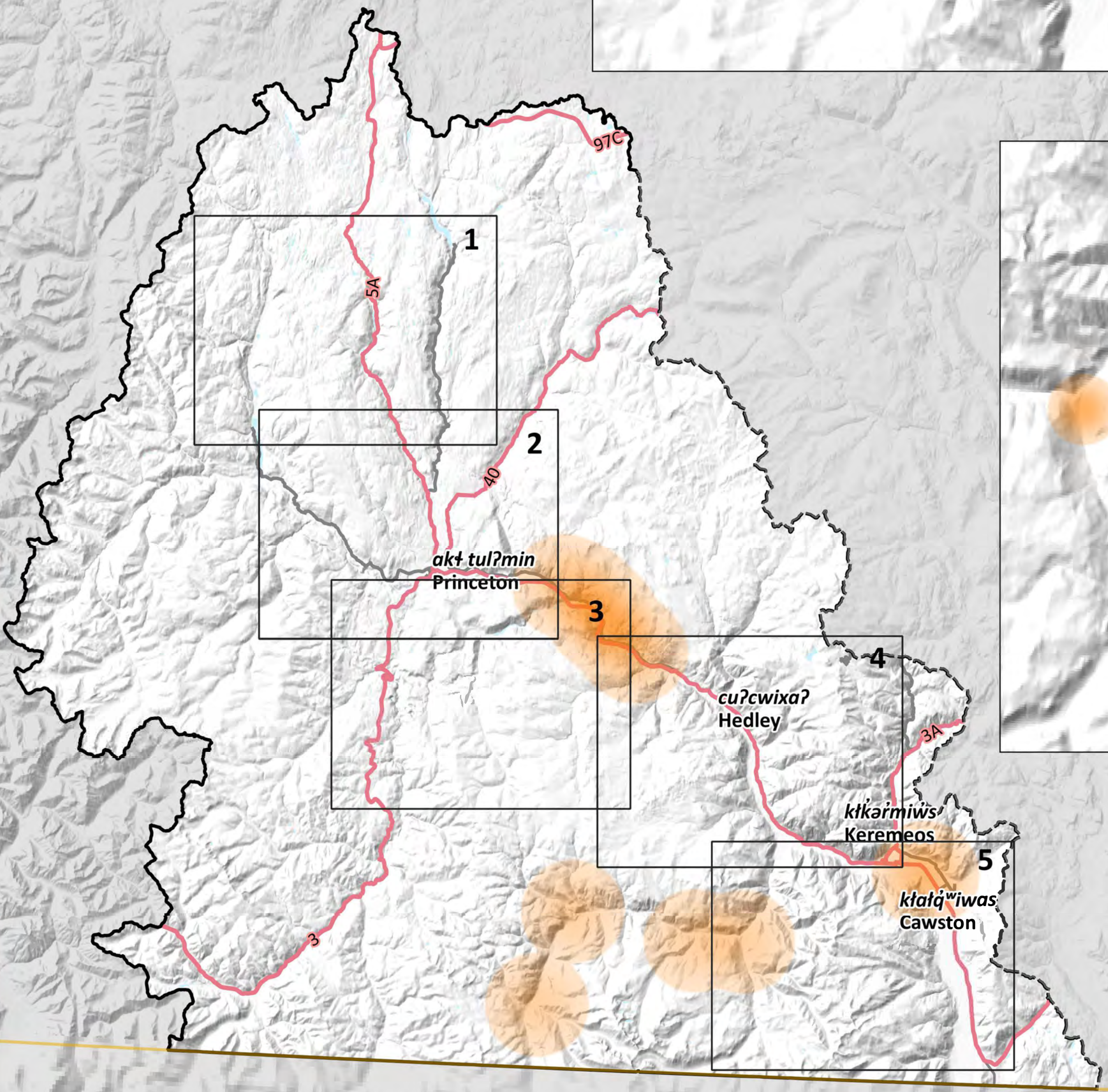
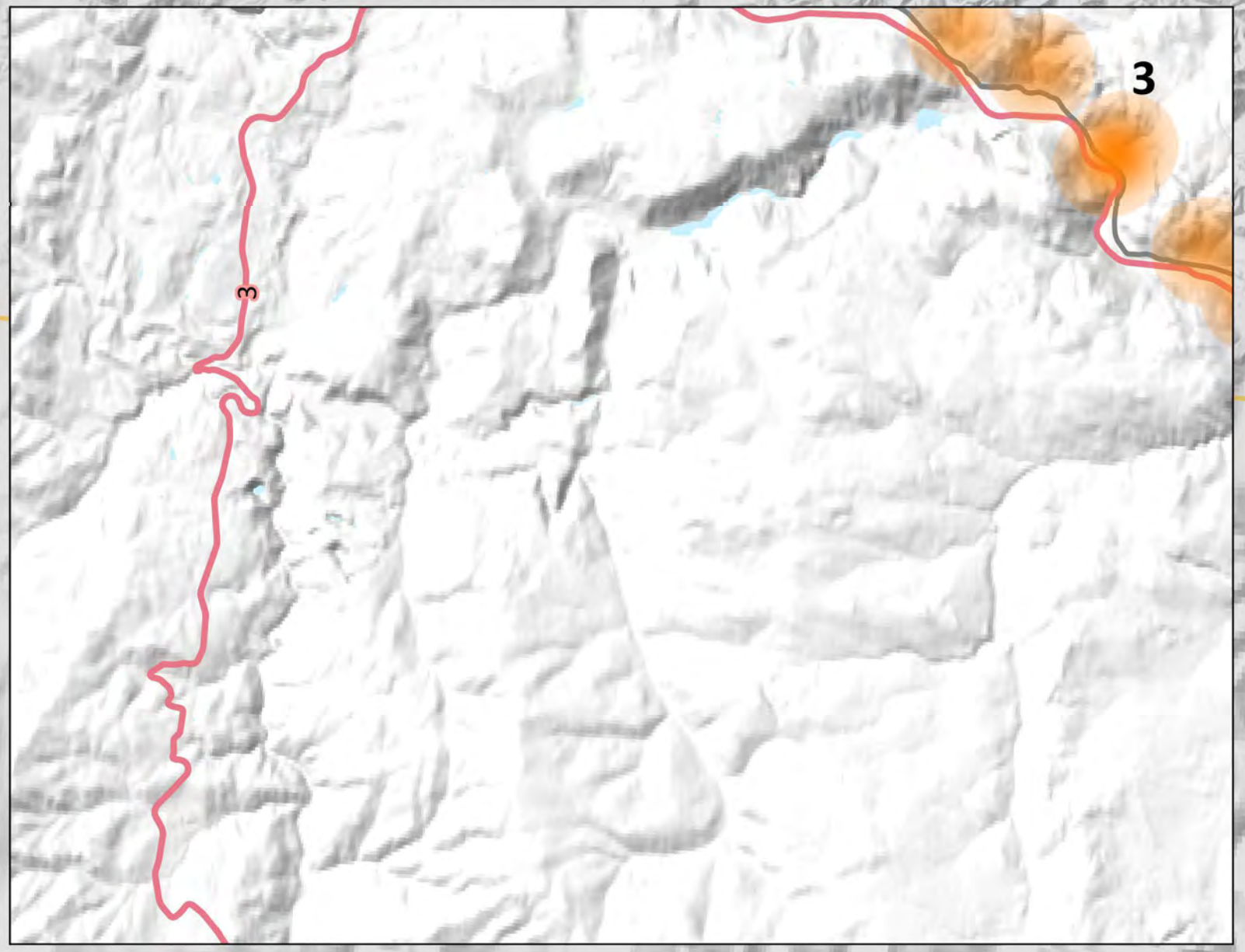
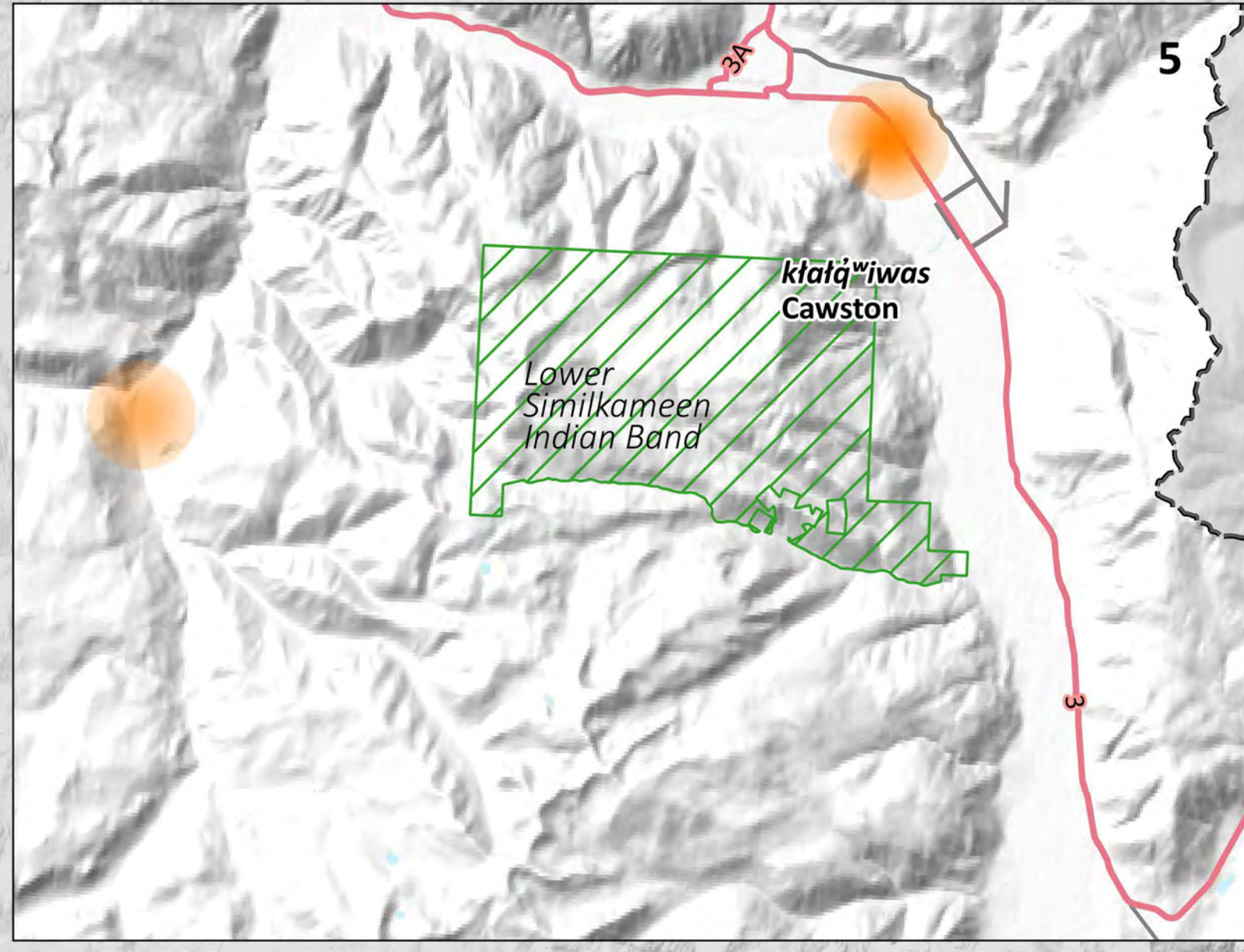
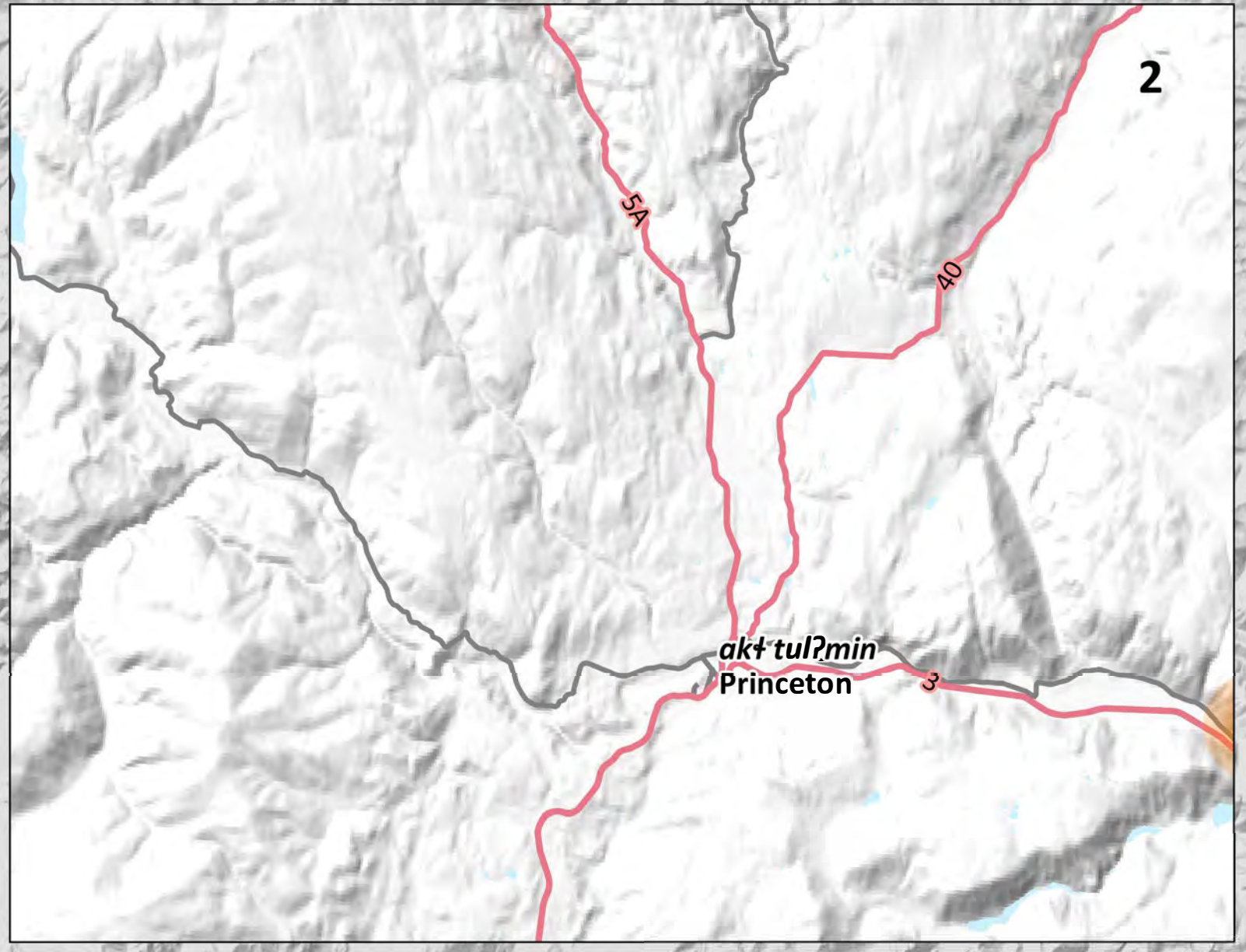
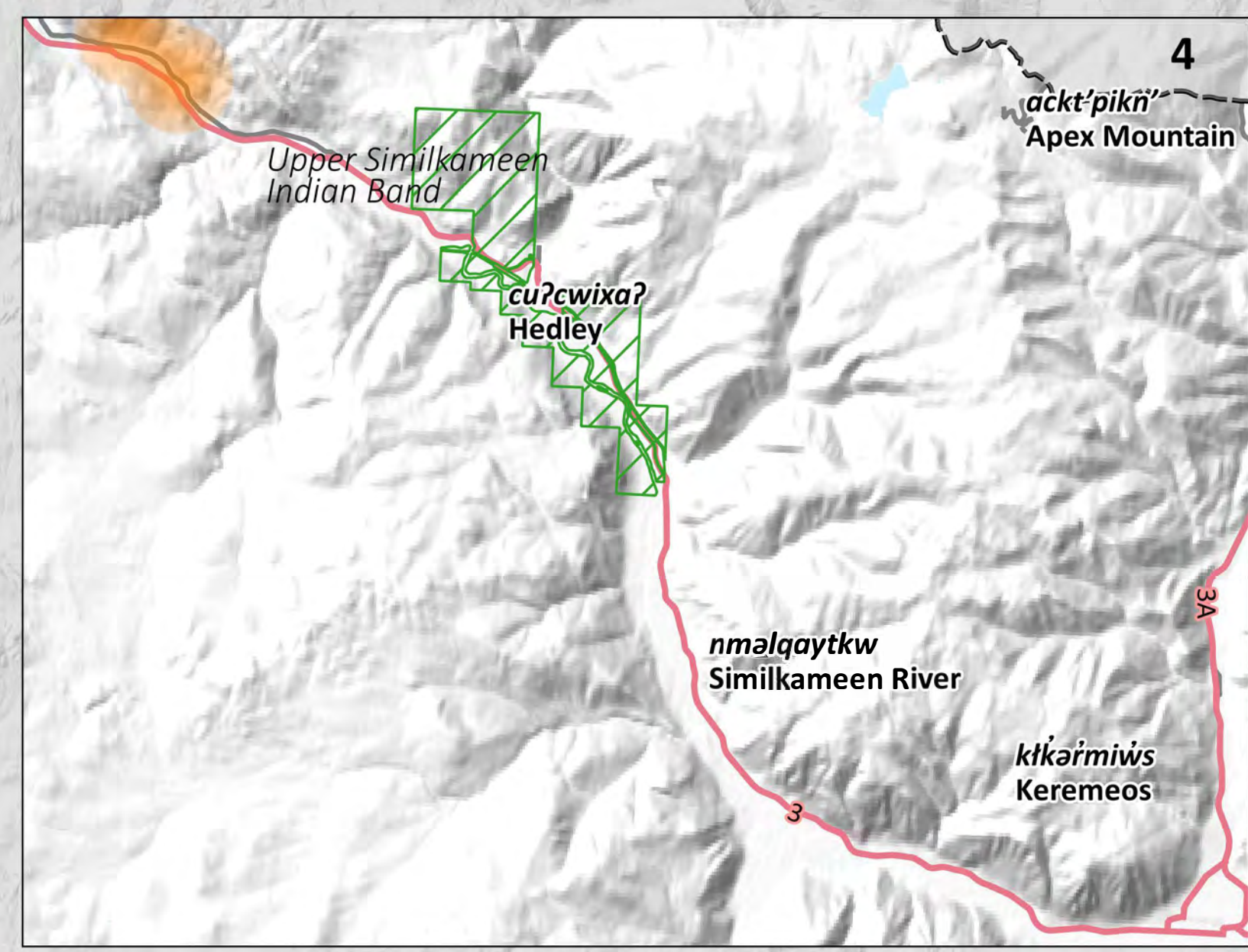
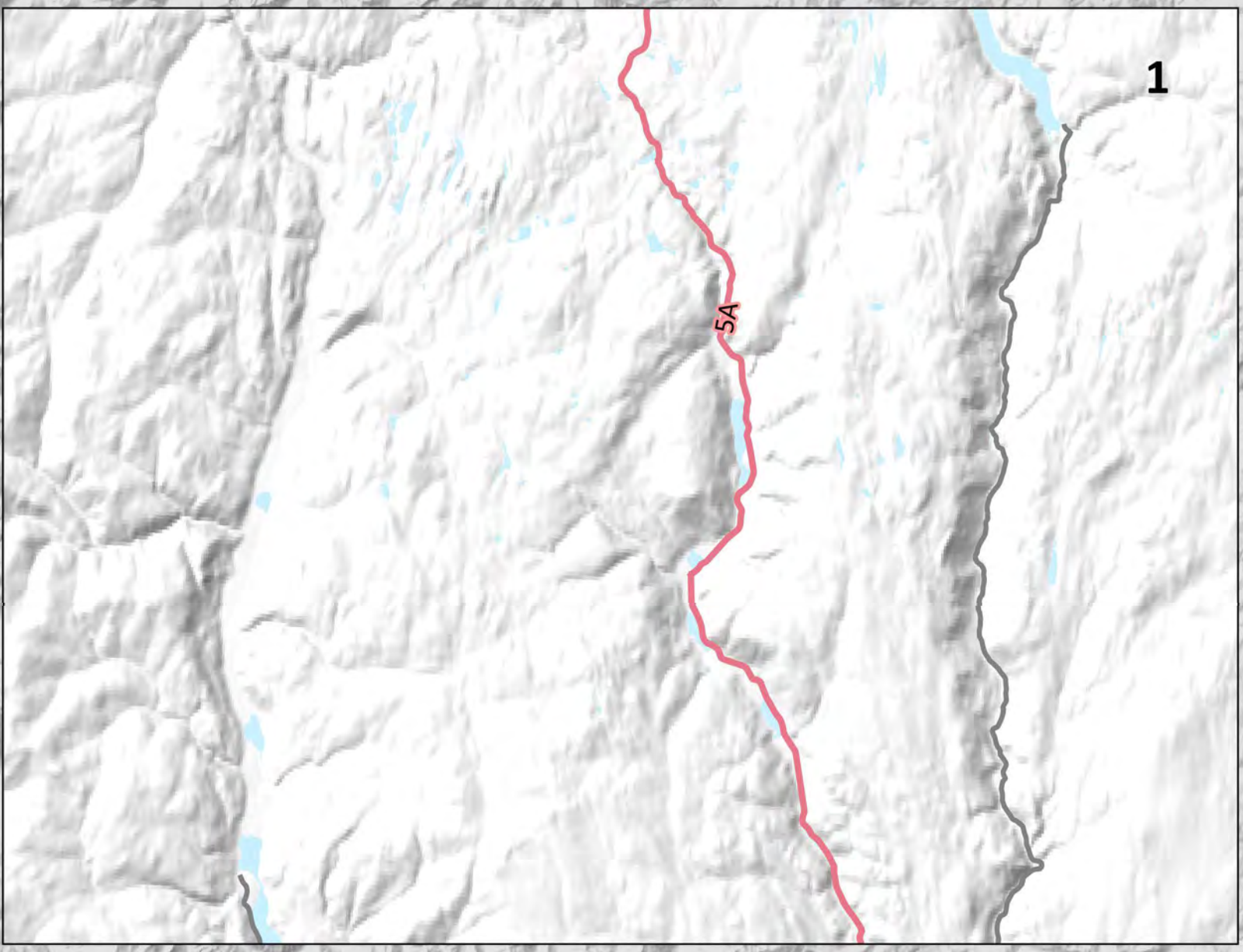
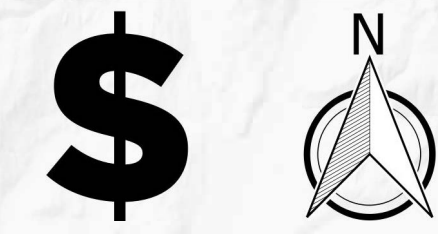
Legend

Background	
— Watershed Boundary	🔴 Economic Impacts
- - - Okanagan-Similkameen Boundary	
— Canada - US Border	
🟦 Lakes	
🟦 Watercourses	
🟢 Highway	
🟢 Major Road	
🟢 Reserves	

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Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Qualitative Impacts - Economy - Okanagan

Similkameen Map



[Click here to go to Project Area Map](#)
[Click here to go to Okanagan Map](#)

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Scale
Main Map 1:400,000
 0 10 20 30 km

Inset Maps 1:150,000
 0 5 10 15 km

Legend

	Background		Economic Impacts
	Watershed Boundary		
	Okanagan-Similkameen Boundary		
	Canada - US Border		
	Lakes		
	Watercourses		
	Highway		
	Major Road		
	Reserves		

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Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Qualitative Impacts - Economy - Similkameen

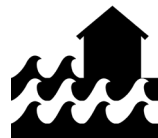
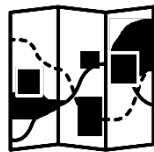
Sylix Okanagan Flood and Debris Flow Risk Assessment

Map Book

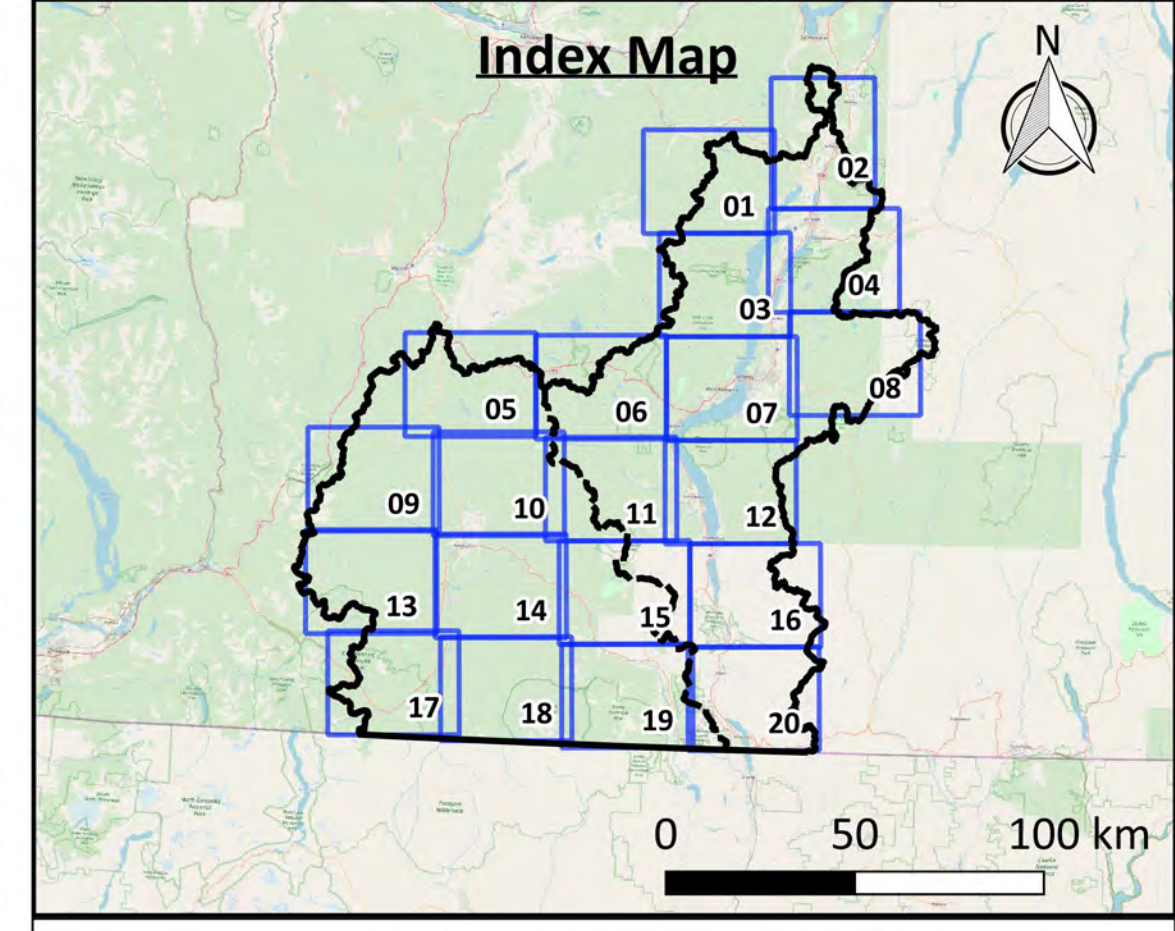
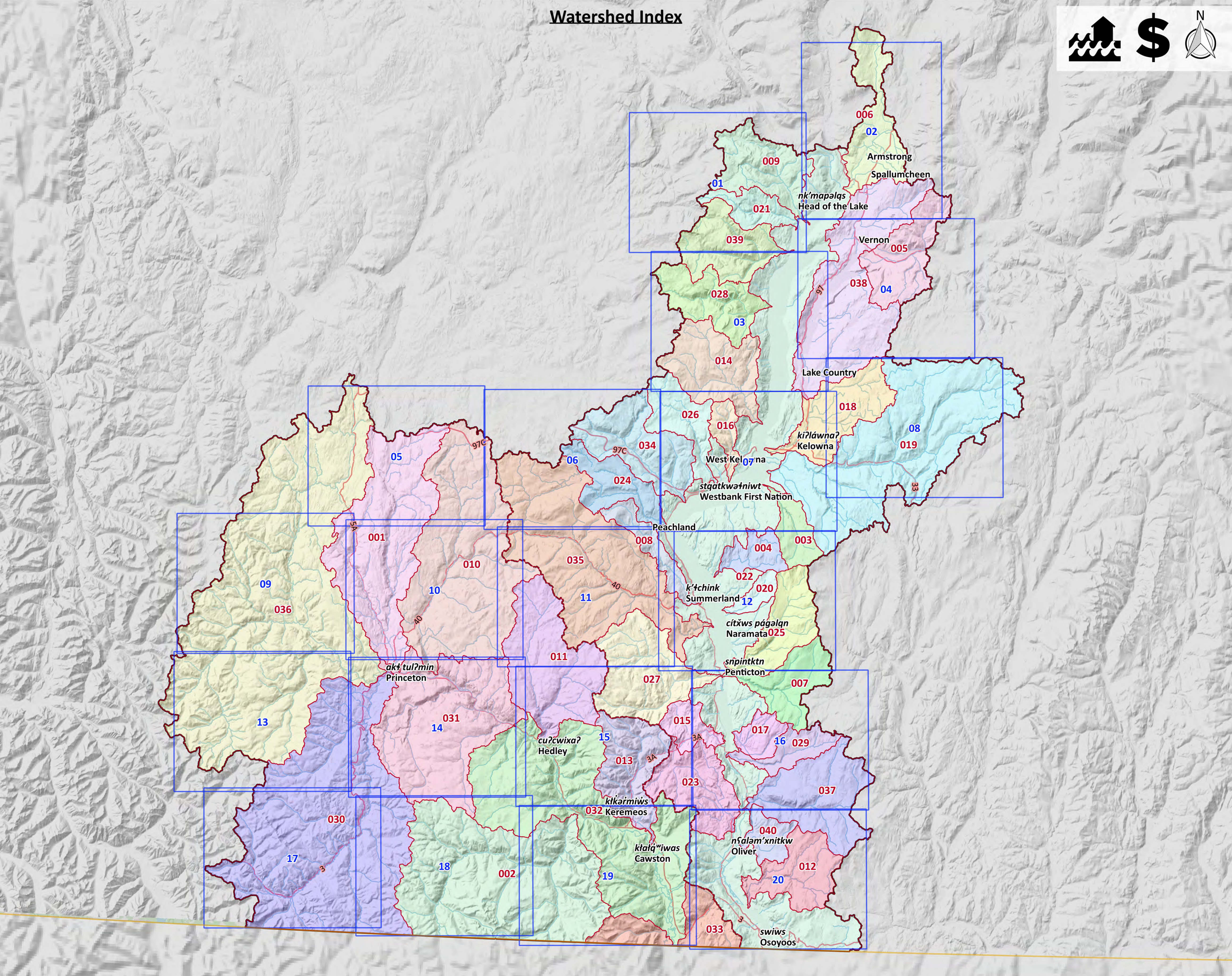
Map Series 6 of 7: Economy Indicator



Quantitative Flood Consequence Maps



Watershed Index



Click on the blue map tile to go to the Zoom-In map

Legend

- | | |
|-------------------------------------|---------------------------|
| Background | Sub-Watersheds |
| — Watershed Boundary | 001 - Allison Creek |
| - - - Okanagan-Similkameen Boundary | 002 - Ashnola River |
| — Canada - US Border | 003 - Bellevue Creek |
| — Lakes | 004 - Chute Creek |
| — Watercourses | 005 - Coldstream Creek |
| — Highway | 006 - Deep Creek |
| — Major Road | 007 - Ellis Creek |
| □ Map tiles | 008 - Eneas Creek |
| | 009 - Equis Creek |
| | 010 - Hayes Creek |
| | 011 - Hedley Creek |
| | 012 - Inkaneep Creek |
| | 013 - Keremeos Creek |
| | 014 - Lambly Creek |
| | 015 - Marron River |
| | 016 - McDougall Creek |
| | 017 - McLean Creek |
| | 018 - Mill Creek |
| | 019 - Mission Creek |
| | 020 - Naramata Creek |
| | 021 - Naswhito Creek |
| | 022 - Okanagan River |
| | 023 - Park Rill |
| | 024 - Peachland Creek |
| | 025 - Penticton Creek |
| | 026 - Powers Creek |
| | 027 - Shingle Creek |
| | 028 - Shorts Creek |
| | 029 - Shuttleworth Creek |
| | 030 - Similkameen River 1 |
| | 031 - Similkameen River 2 |
| | 032 - Similkameen River 3 |
| | 033 - Similkameen River 4 |
| | 034 - Trepanier Creek |
| | 035 - Trout Creek |
| | 036 - Tulameen River |
| | 037 - Vaseux Creek |
| | 038 - Vernon Creek |
| | 039 - Whiteman Creek |
| | 040 - Wolfcub Creek |

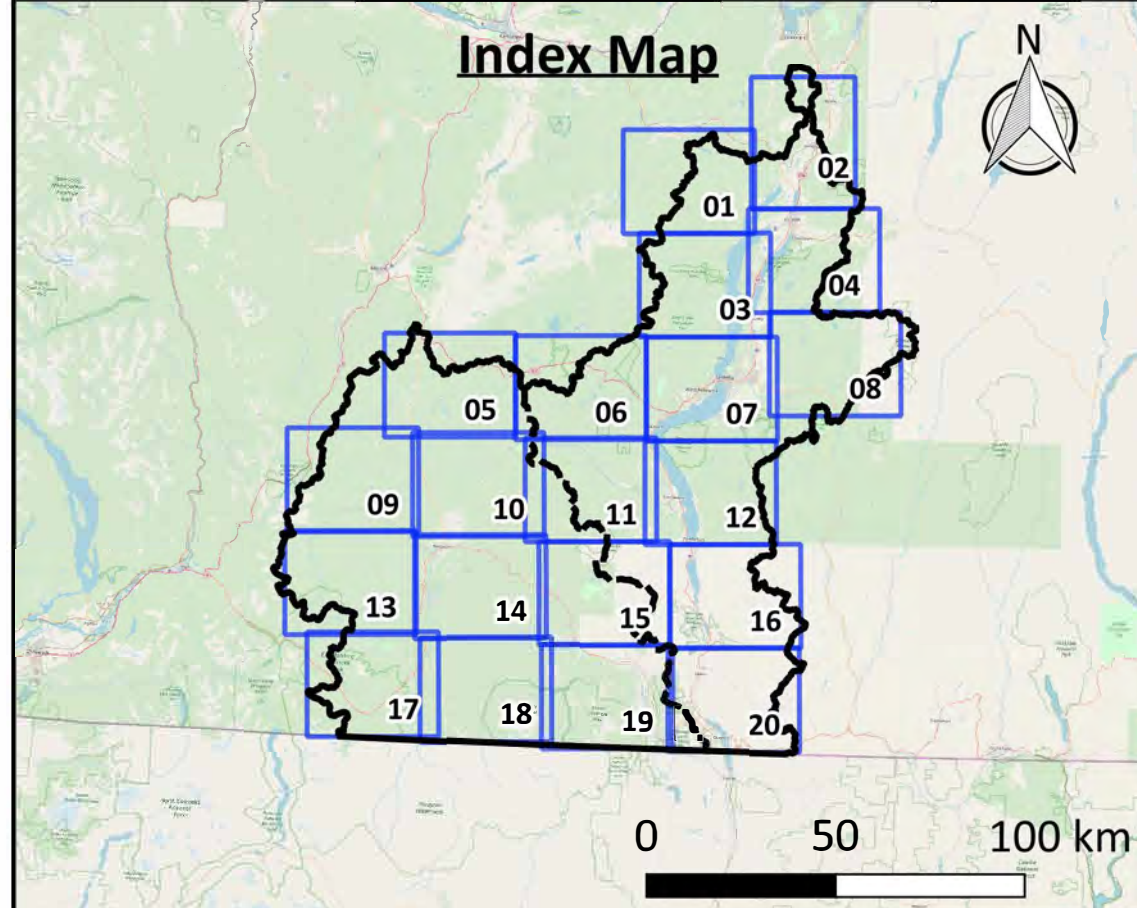
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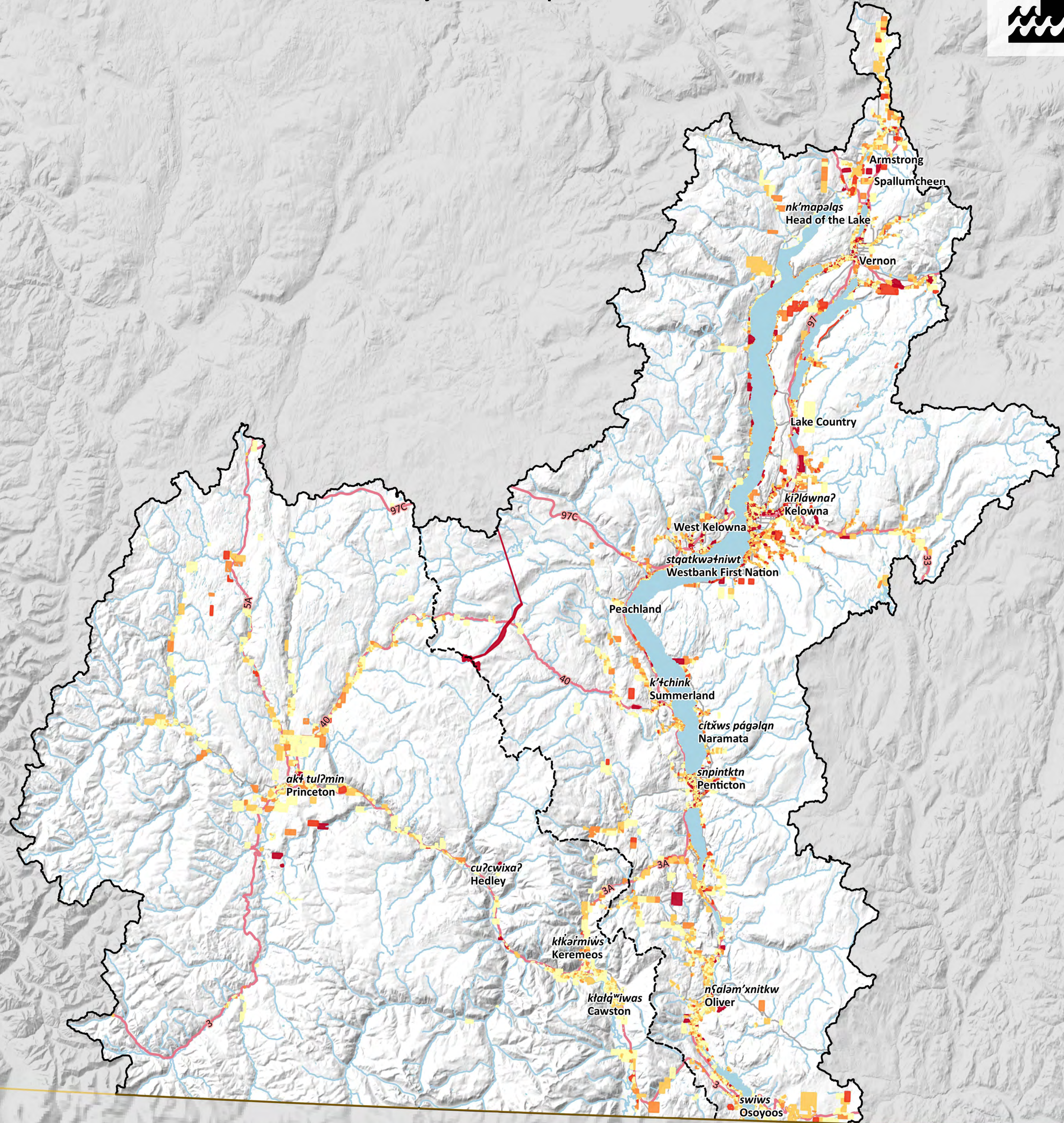
Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy

ANSI D - Map No. EC-F-001-001

Project Area Map



Click above map tile for Zoom-In map
[Click here to go to Okanagan Map](#)
[Click here to go to Similkameen Map](#)



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Scale 1:350,000
 0 10 20 30 km

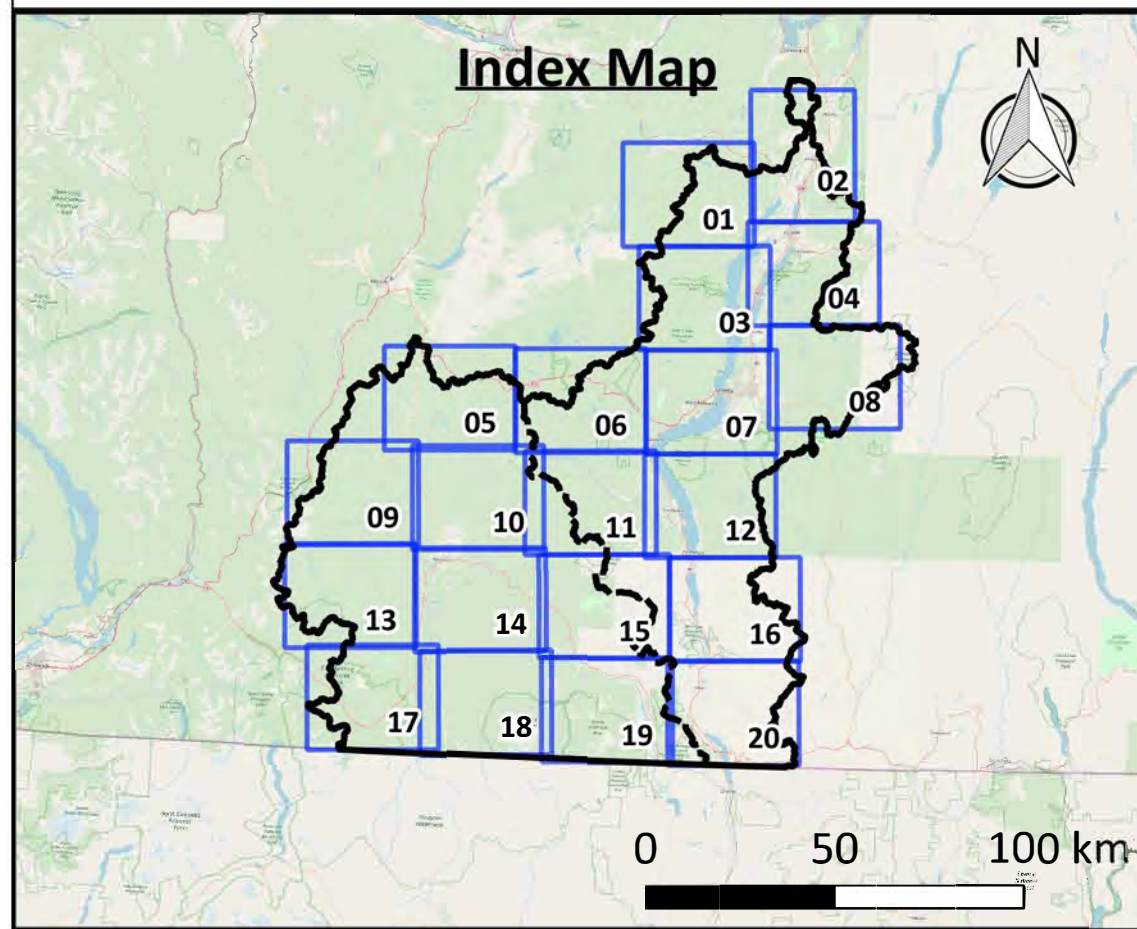
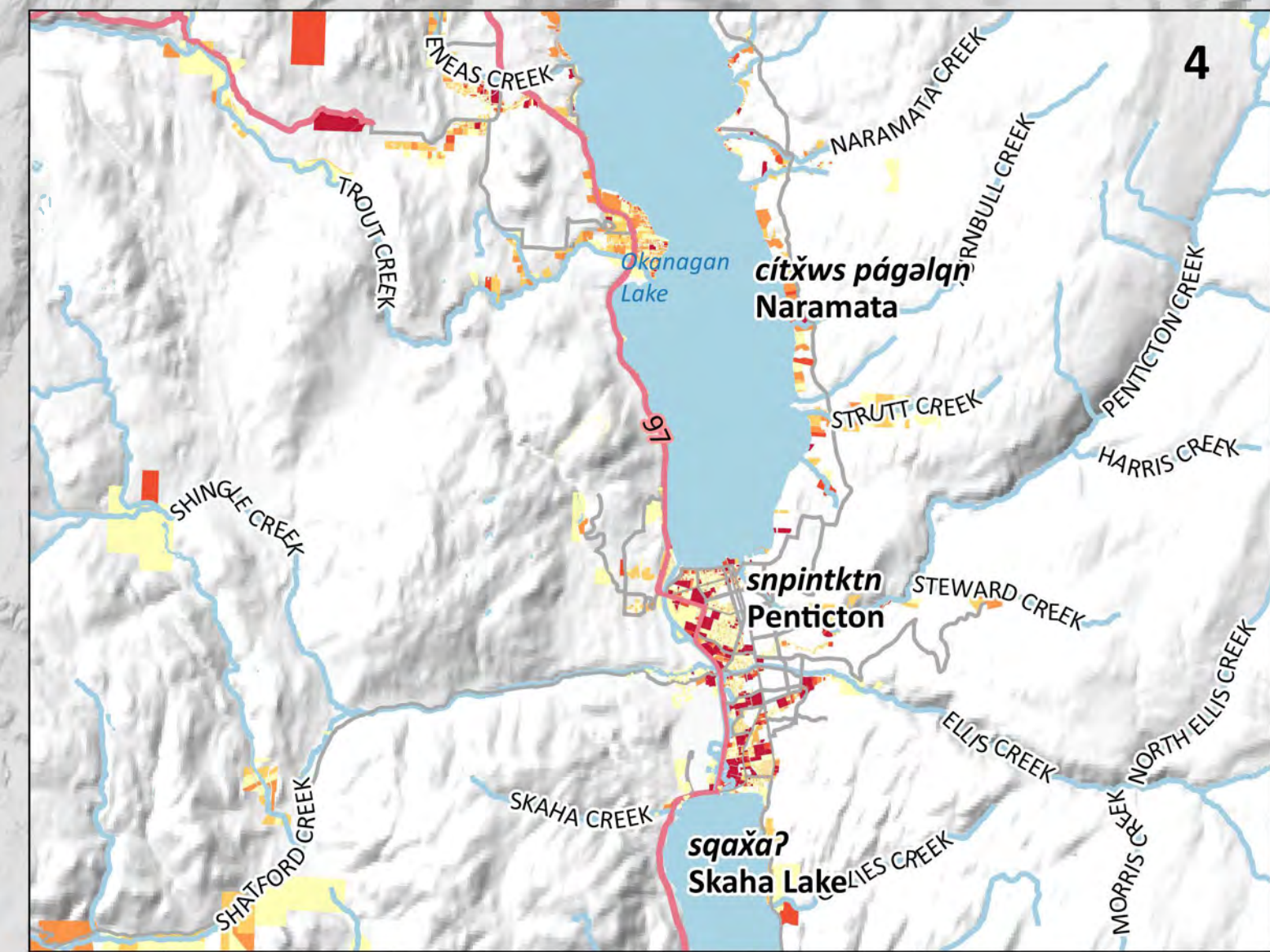
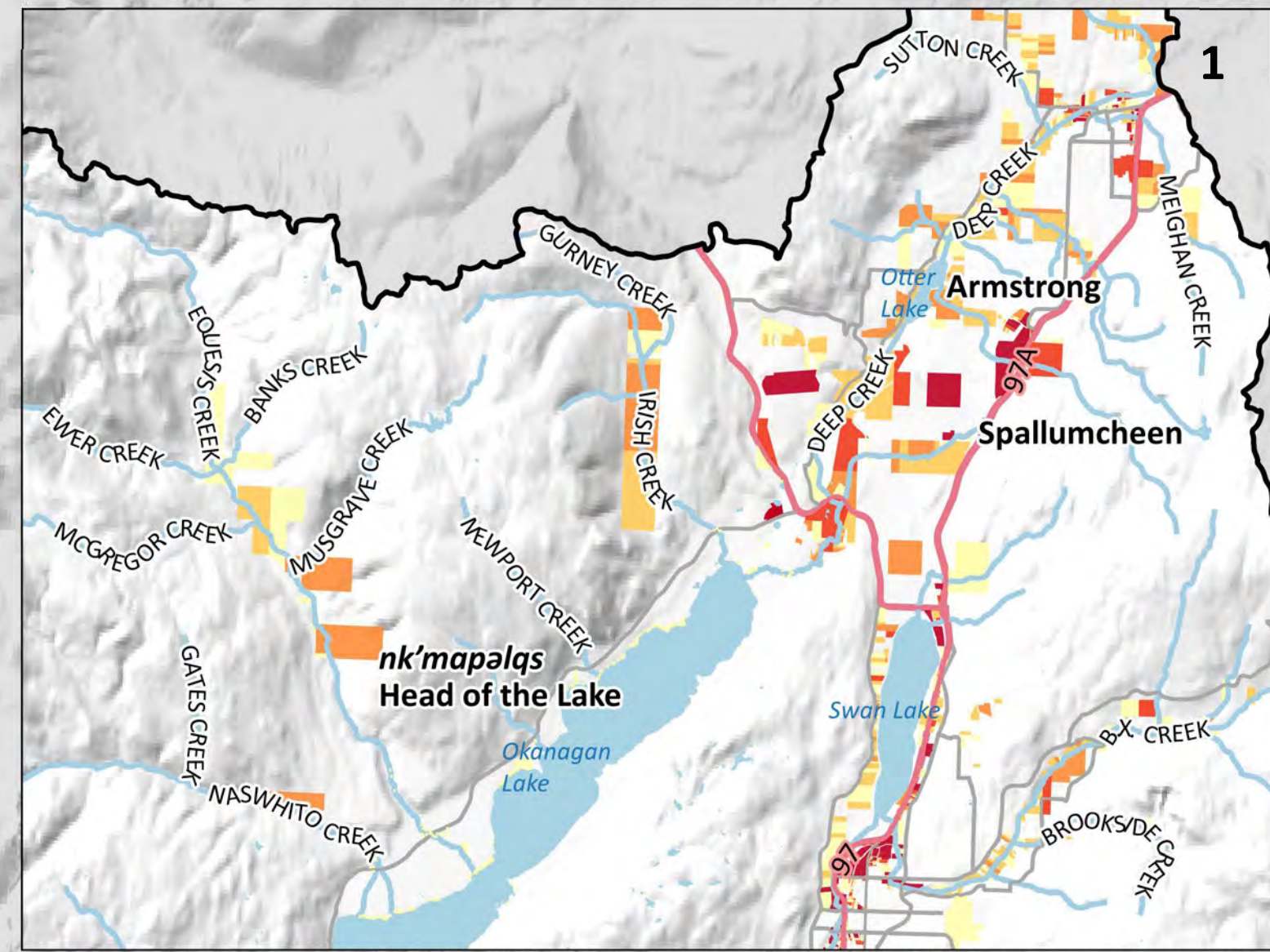
Legend

Background	Affected Assets
— Watershed Boundary	Property Values
-- Okanagan-Similkameen Boundary	Light Yellow: \$1 - \$250,000
— Canada - US Border	Yellow: \$250,000 - \$500,000
— Lakes	Orange: \$500,000 - \$1,000,000
— Watercourses	Red: \$1,000,000 - \$2,000,000
— Highway	Dark Red: \$2,000,000 +
— Major Road	

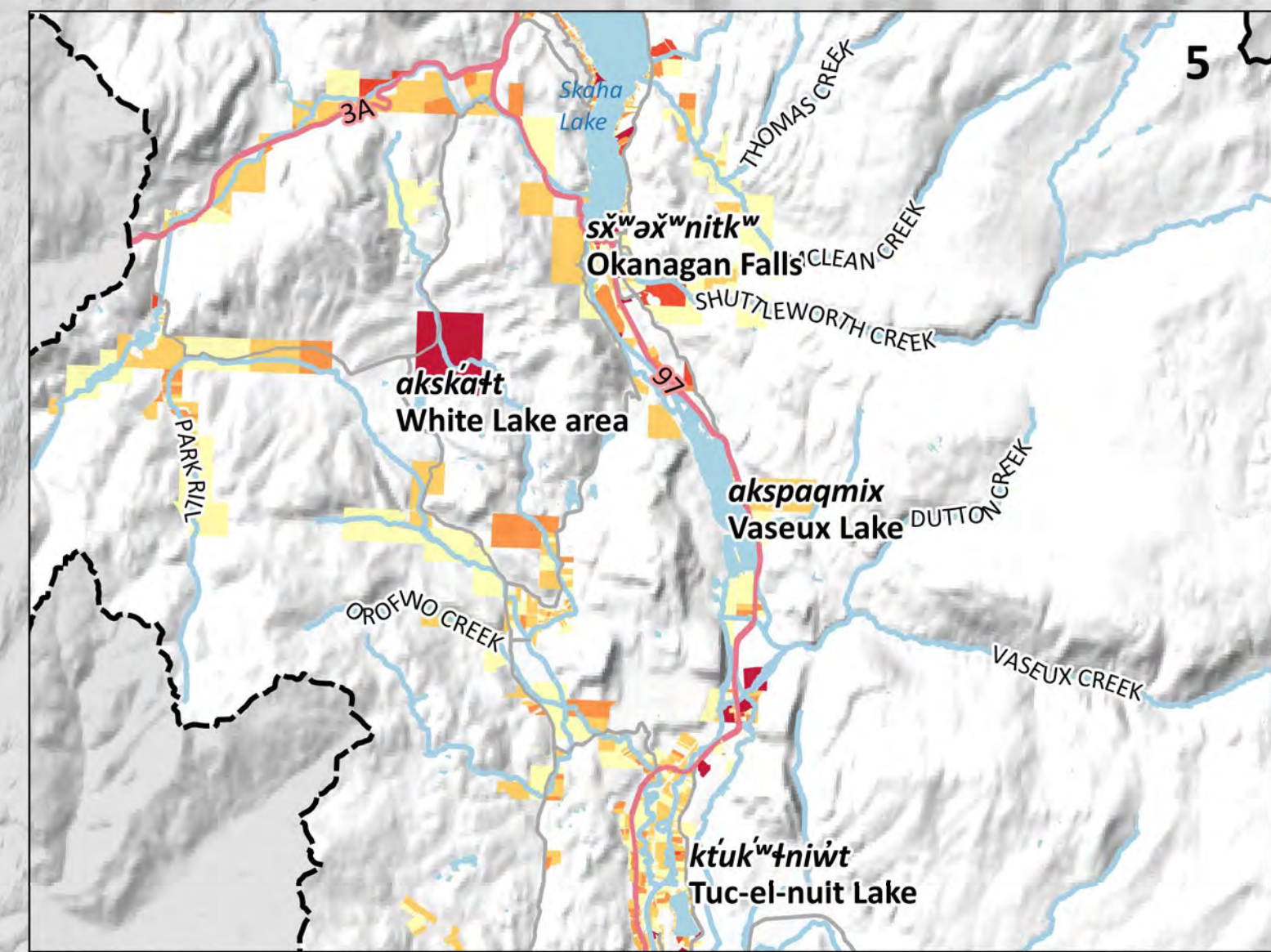
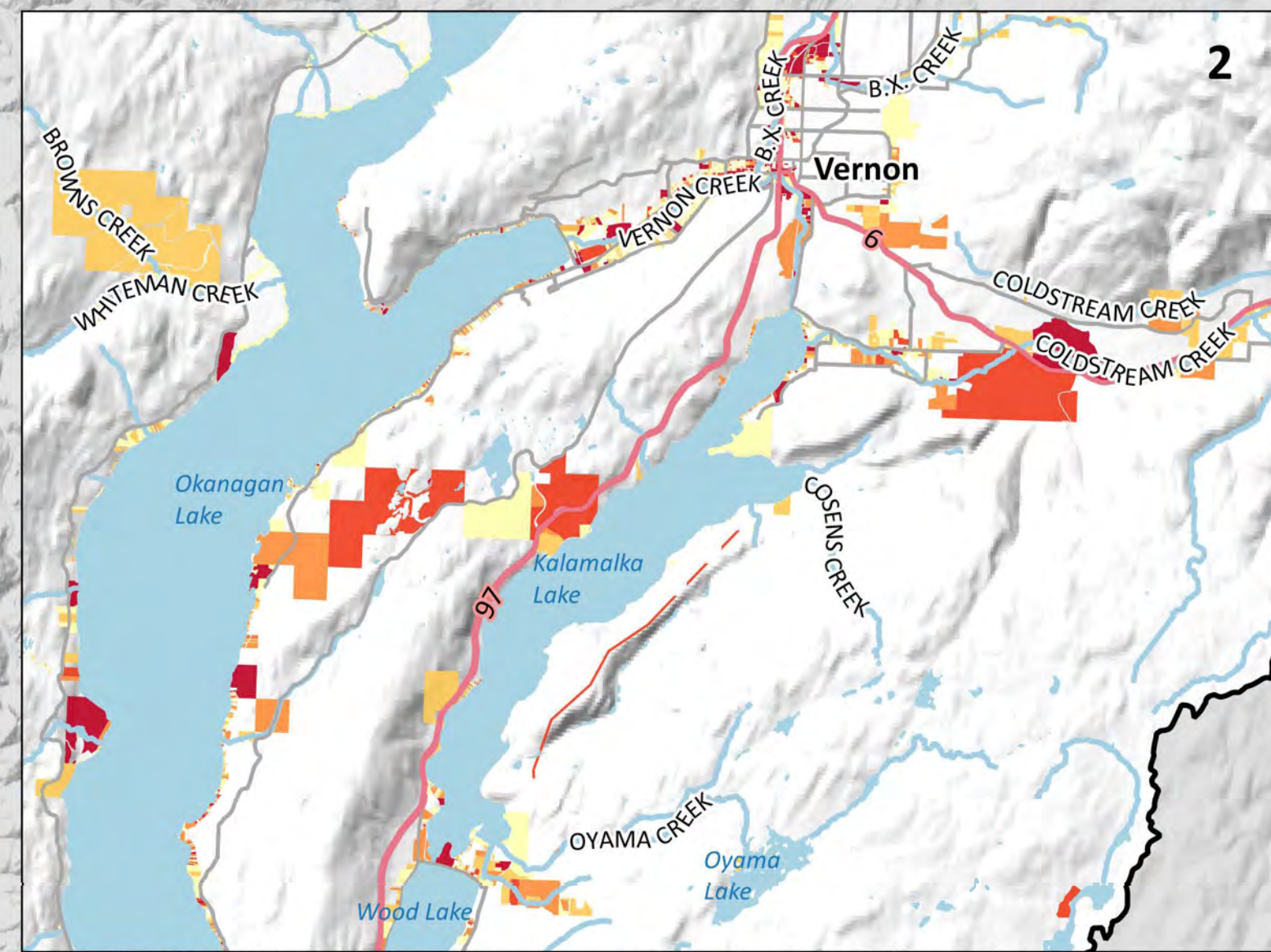
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy

Okanagan Map



Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to go to Similkameen map](#)

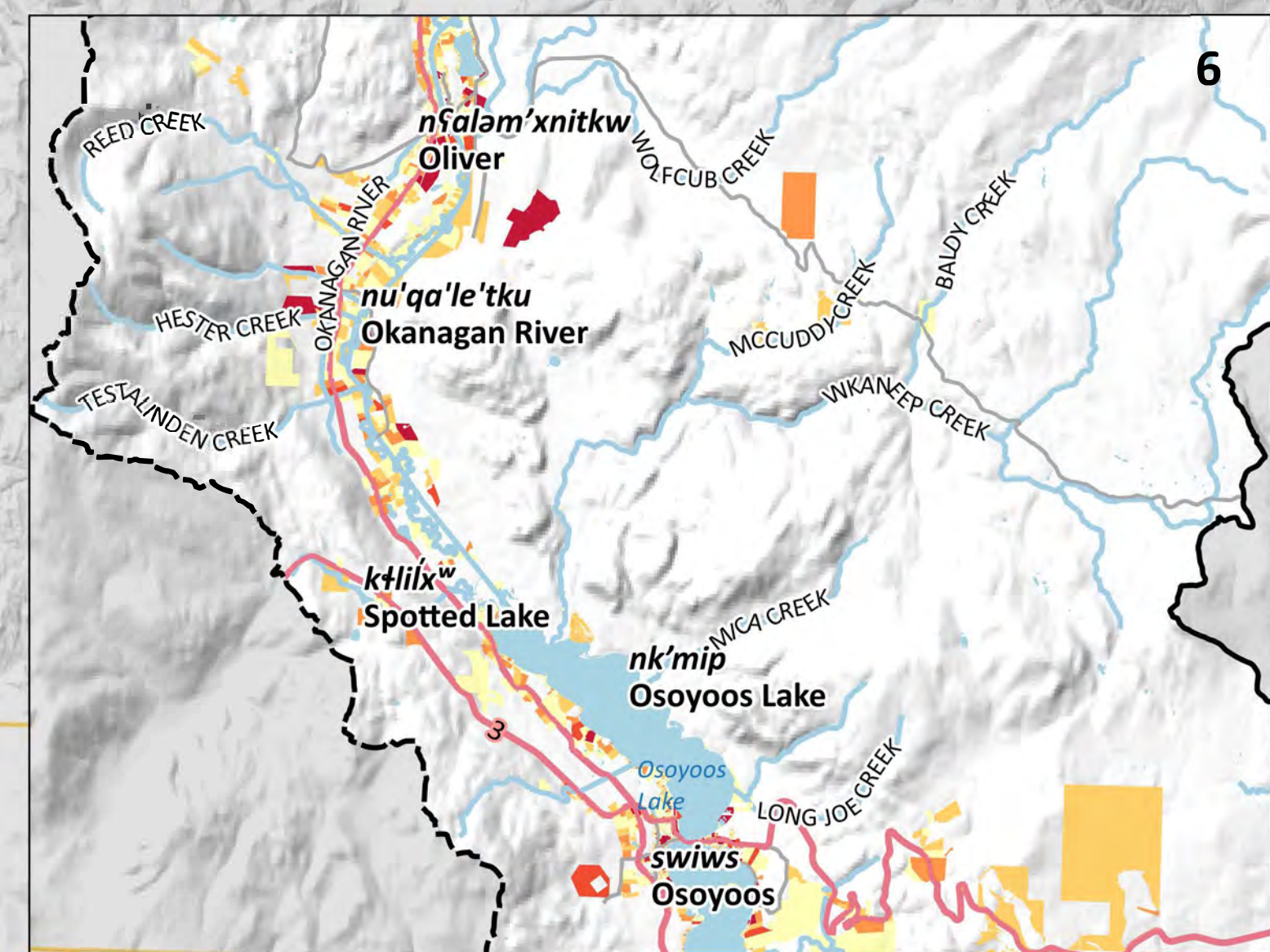
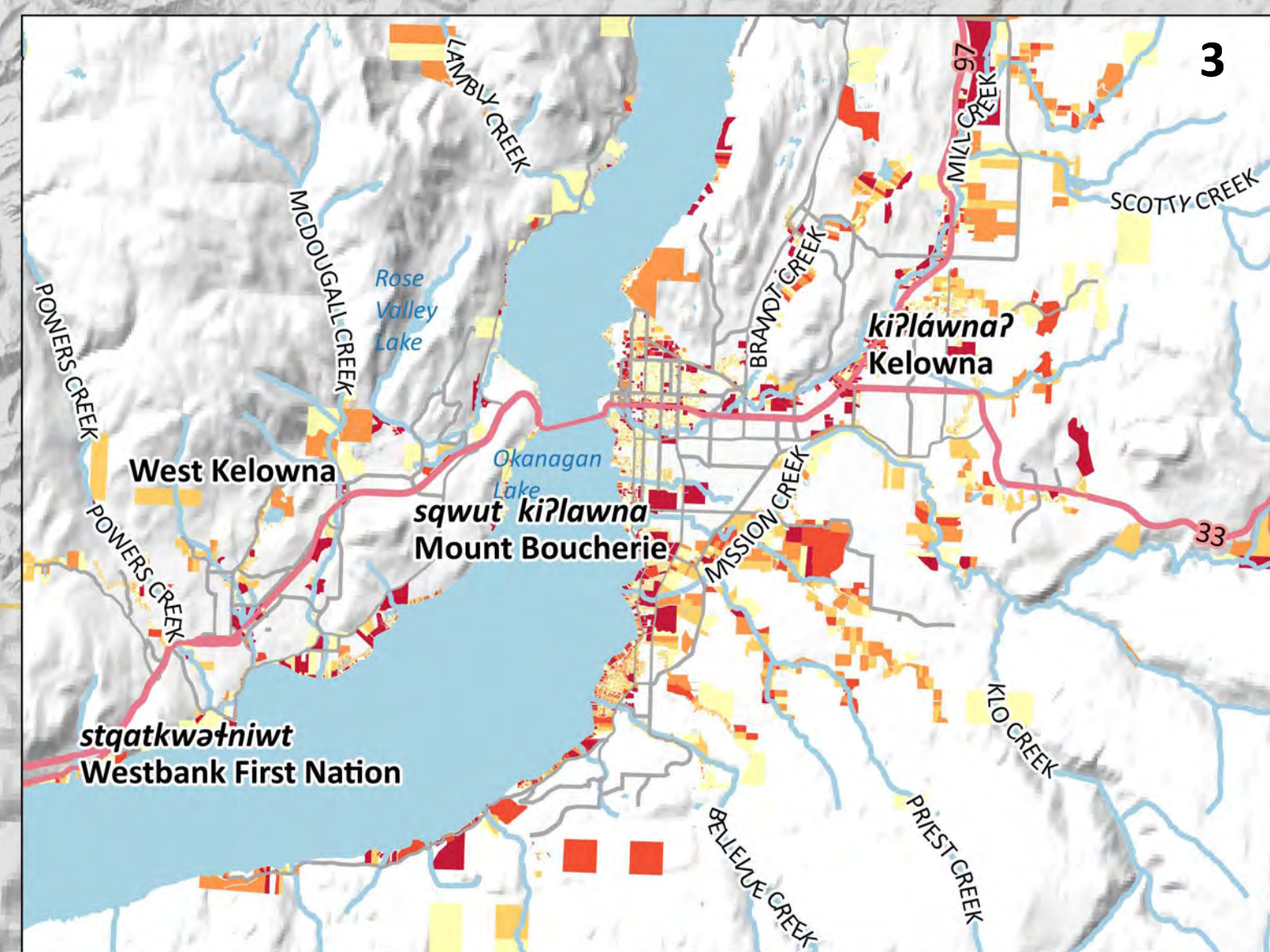


Map Notes

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Data Sources

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- Land Values: BC Assessment Data and Building Footprints.
- Sylix Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



Scale

Main Map 1:400,000
0 10 20 30 km

Inset Maps 1:150,000
0 5 10 15 km

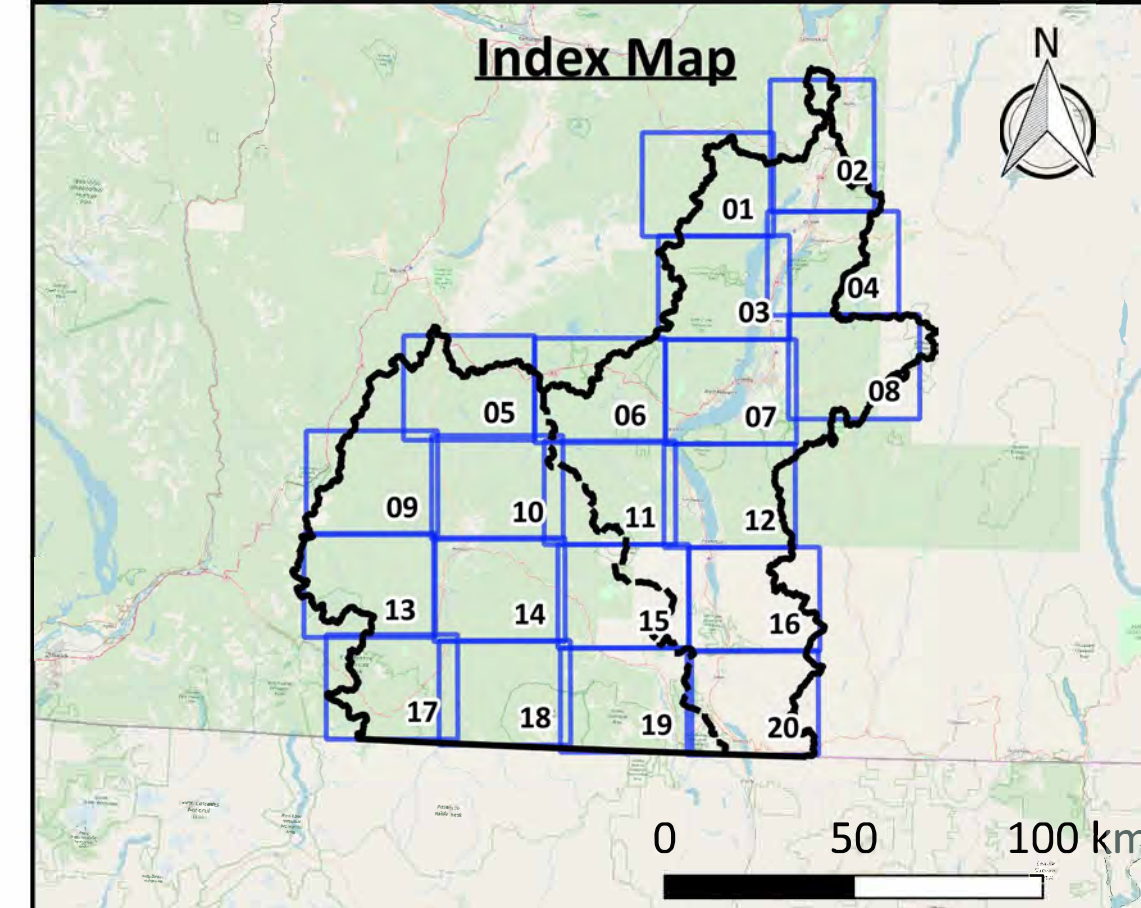
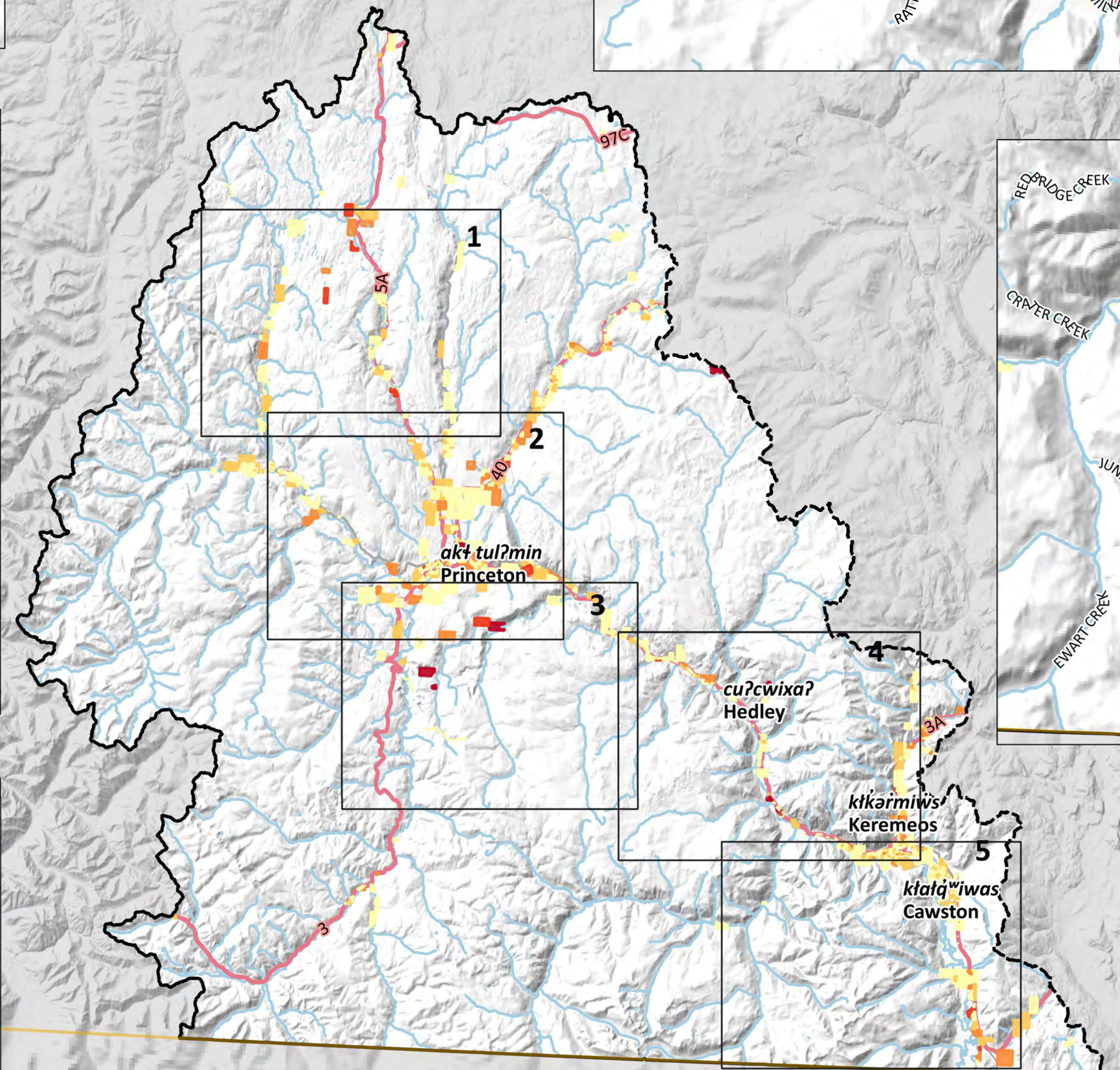
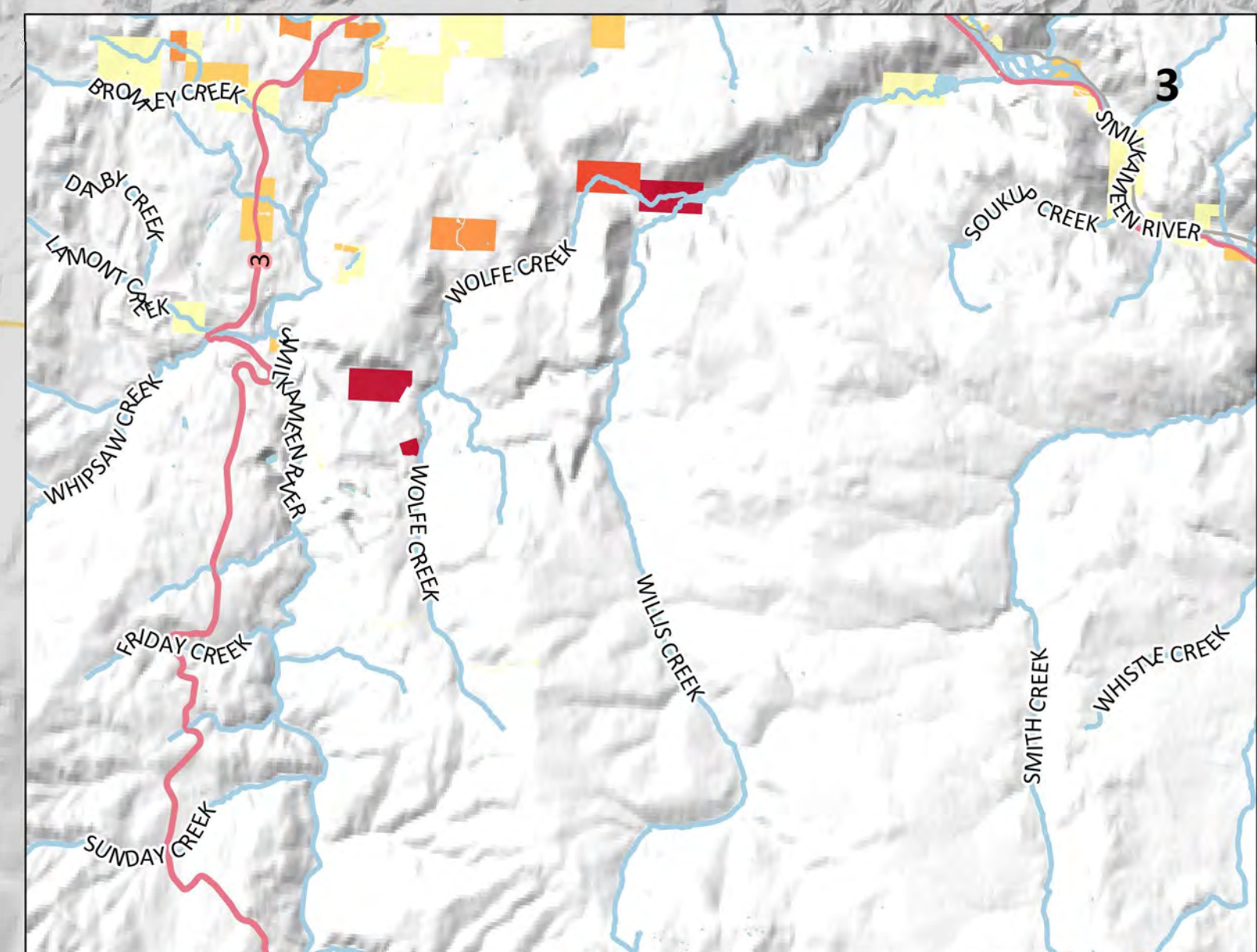
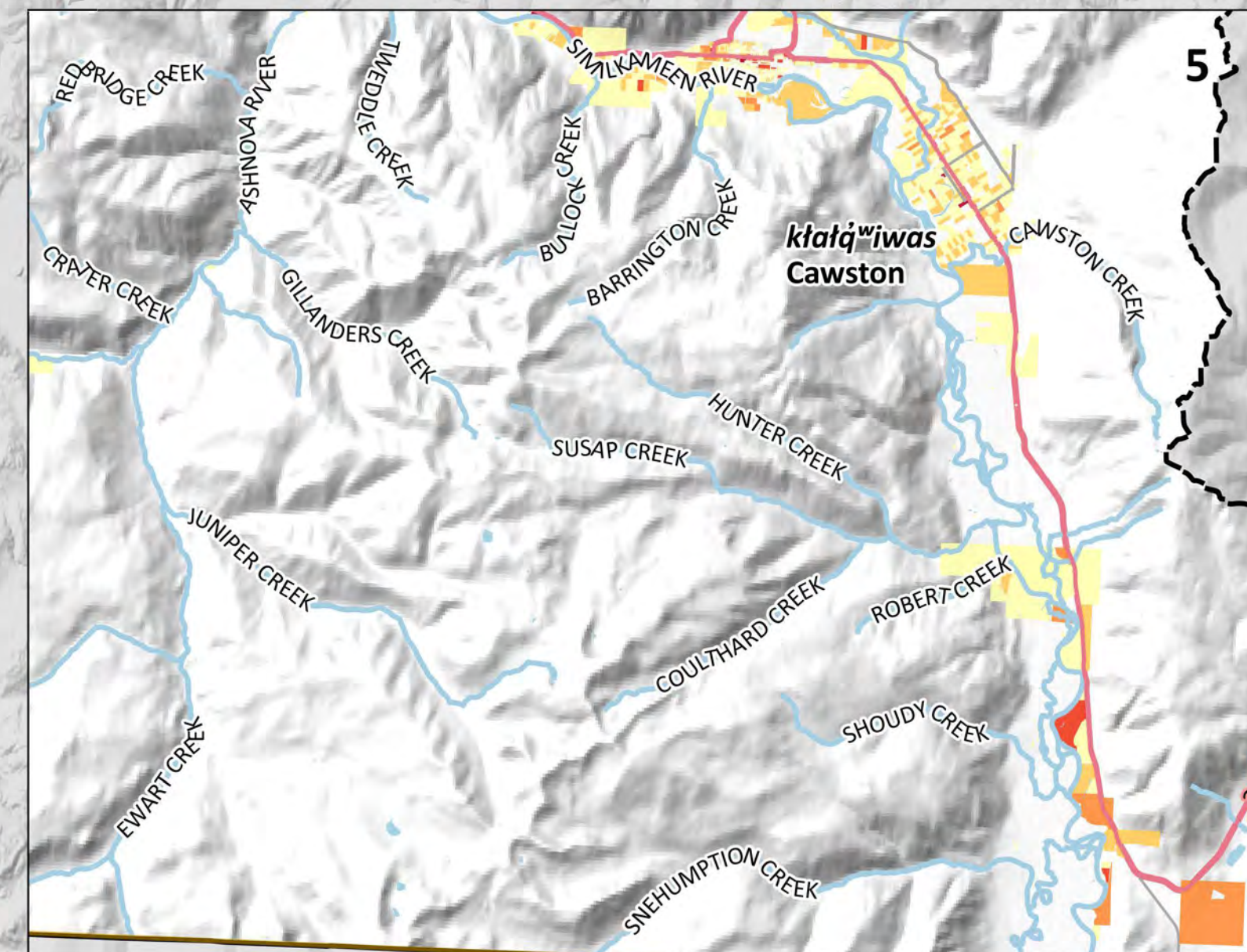
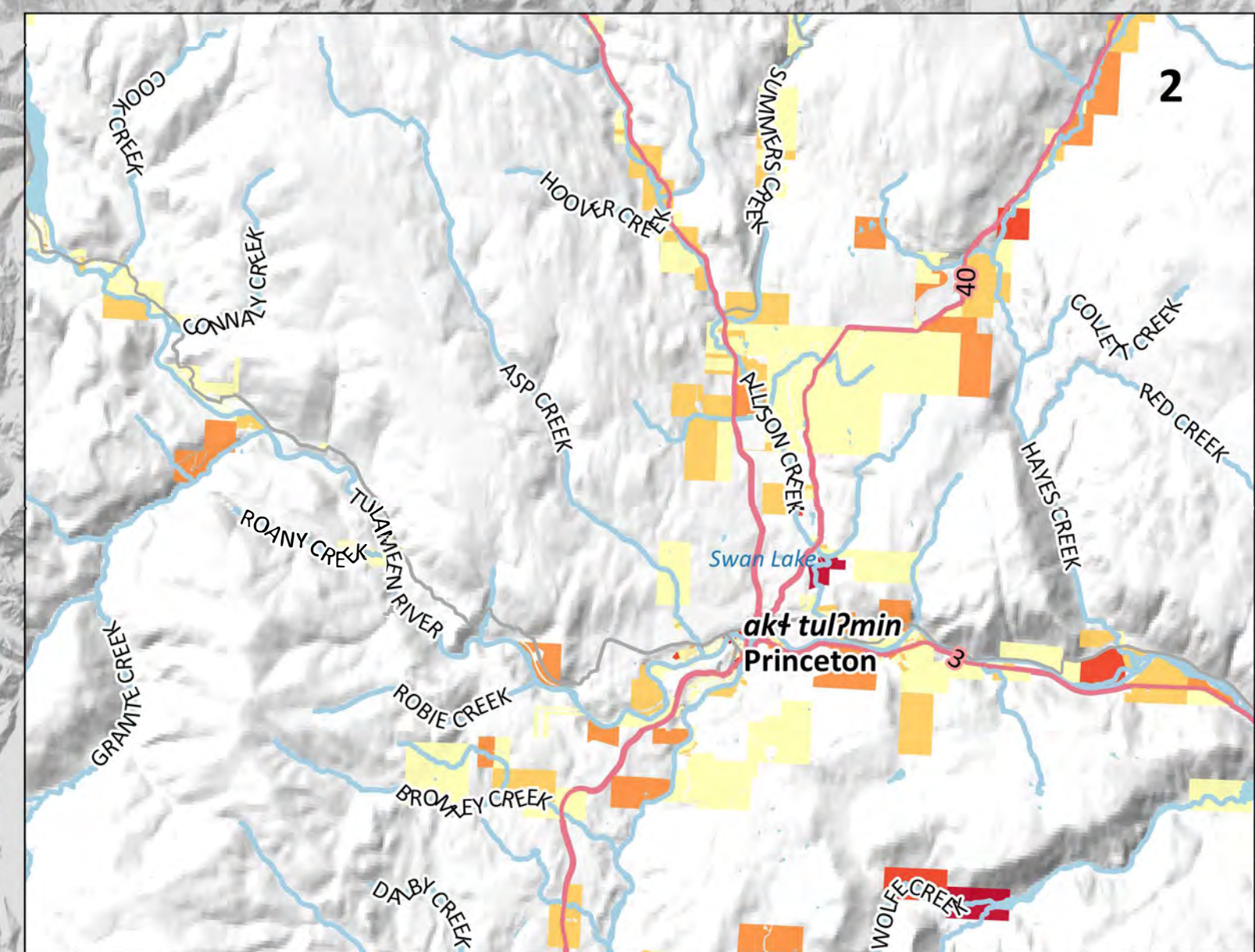
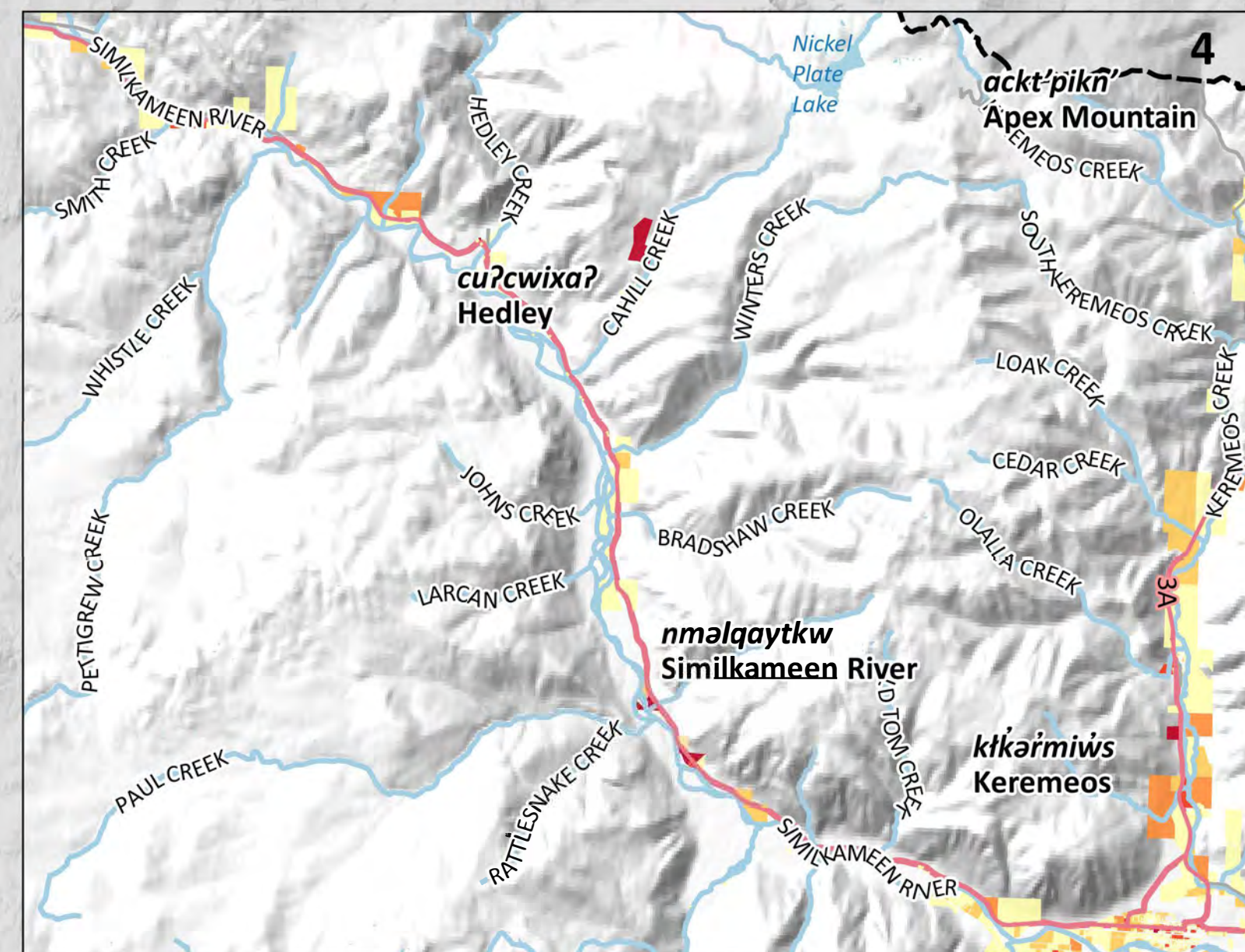
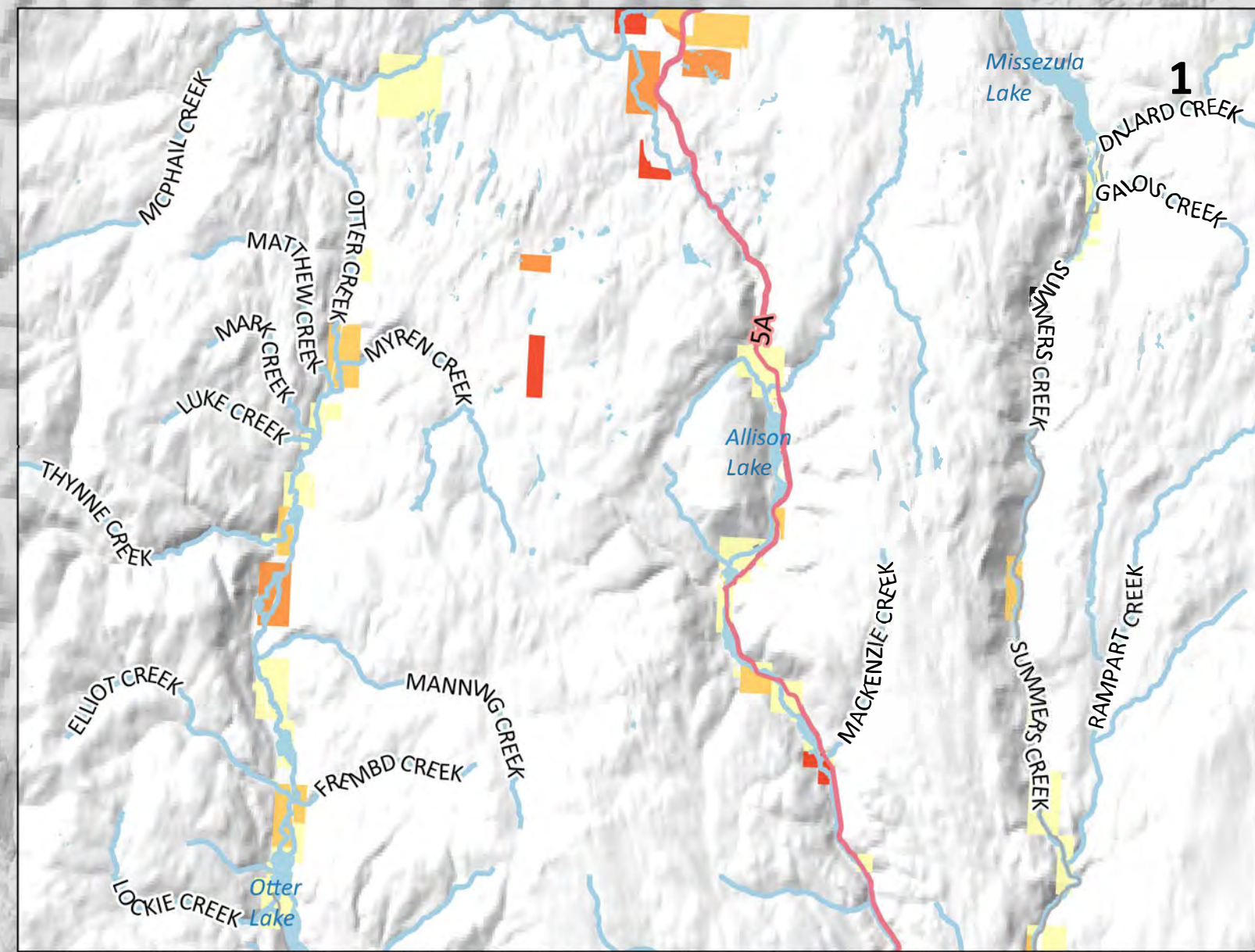
Legend

Background	Affected Assets
Watershed Boundary	Property Values
Canada - US Border	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
 Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy - Okanagan

Similkameen Map



Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to go to Okanagan map](#)

Map Notes

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Data Sources

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- Land Values: BC Assessment Data and Building Footprints.
- Sylix Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.

Scale
Main Map 1:400,000
 0 10 20 30 km

Inset Maps 1:150,000
 0 5 10 15 km

Legend

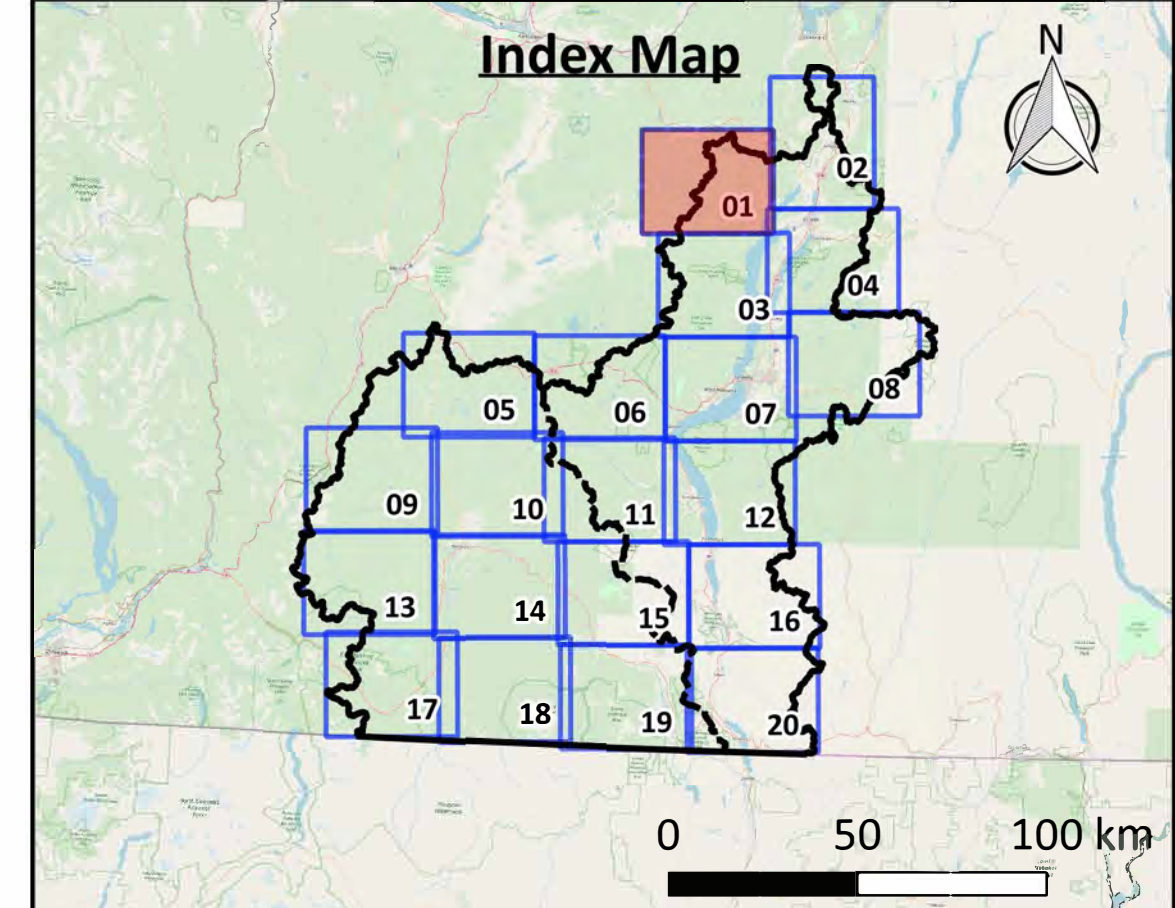
Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	Property Values
Boundary	\$1 - \$250,000
Canada - US Border	\$250,000 - \$500,000
Lakes	\$500,000 - \$1,000,000
Watercourses	\$1,000,000 - \$2,000,000
Highway	\$2,000,000 +
Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy - Similkameen

ANSI D - Map No. EC-F-002-003

Zoom-In Map



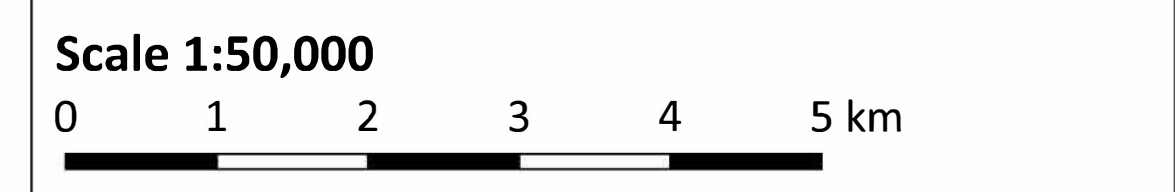
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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Data Sources

- Lakes and Watercourses, Roads and Trails, and Reserves: BC Data Catalogue.
- Land Values: BC Assessment Data and Building Footprints.
- Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
- Sylix Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



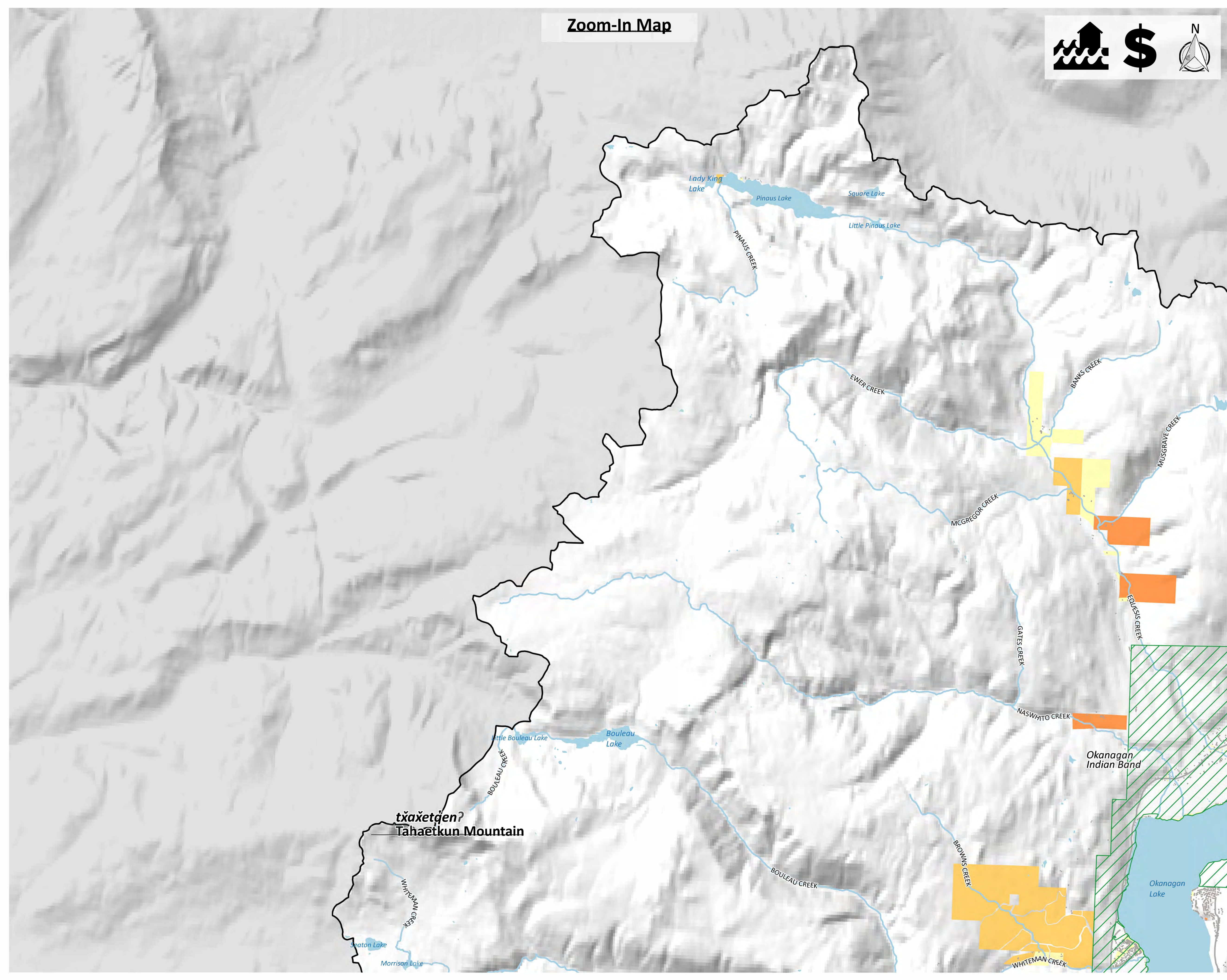
Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

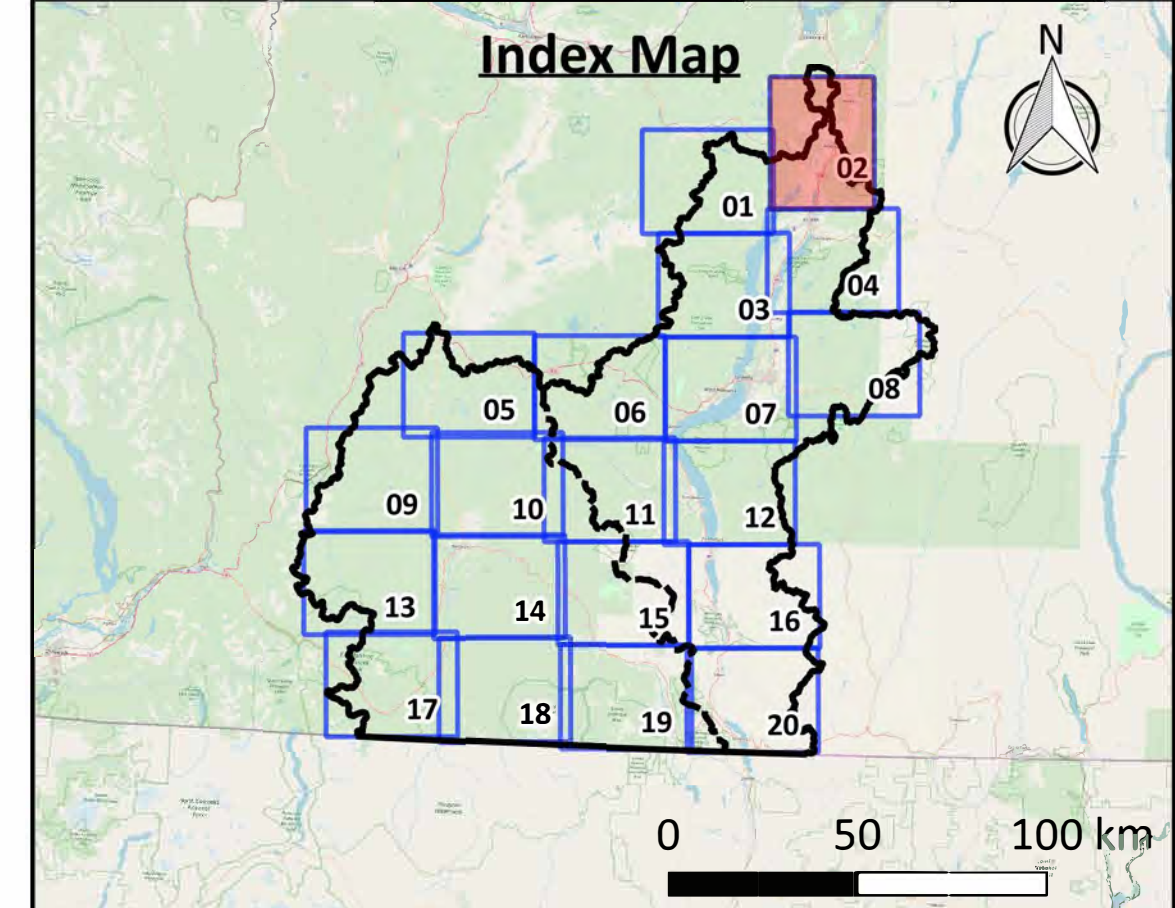
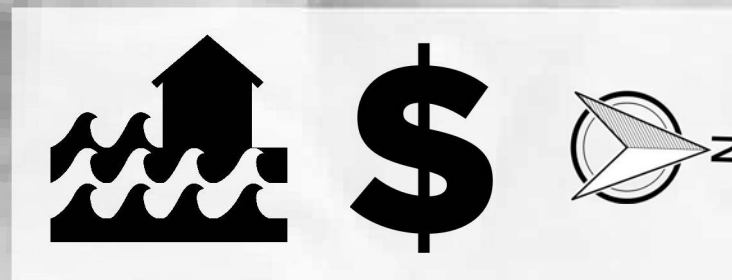
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 01 of 20

ANSI D - Map No. EC-F-003-001



Zoom-In Map



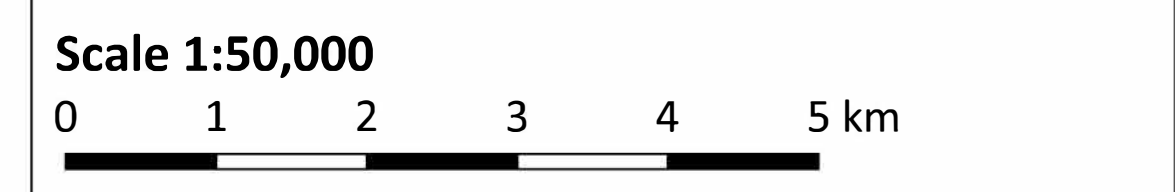
Click above map tile for Zoom-In map
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[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

1. Map produced by Ebbwater Consulting Inc.
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Data Sources

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2. Land Values: BC Assessment Data and Building Footprints.
3. Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
4. Sylix Place Names: Okanagan Nation Alliance.
5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



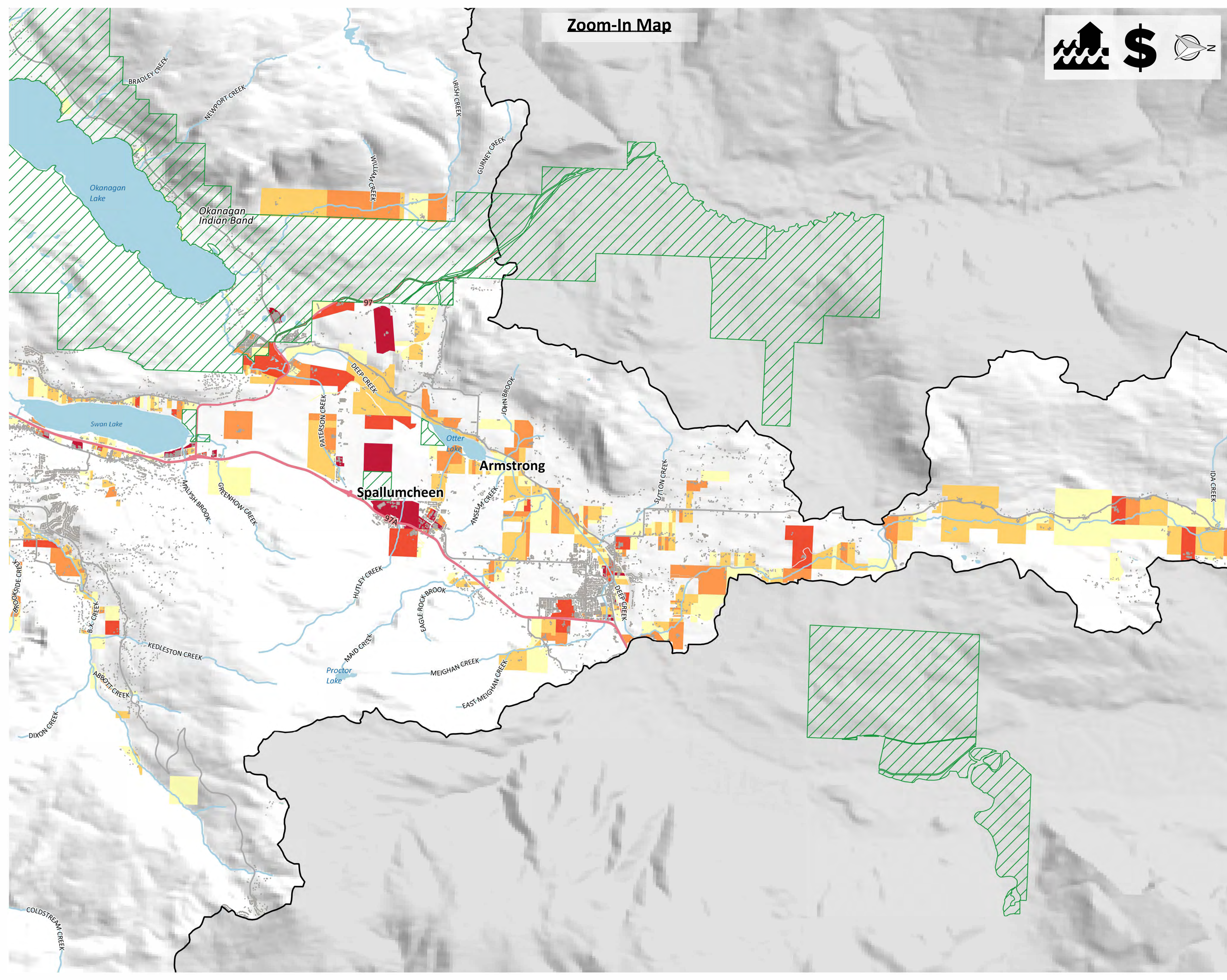
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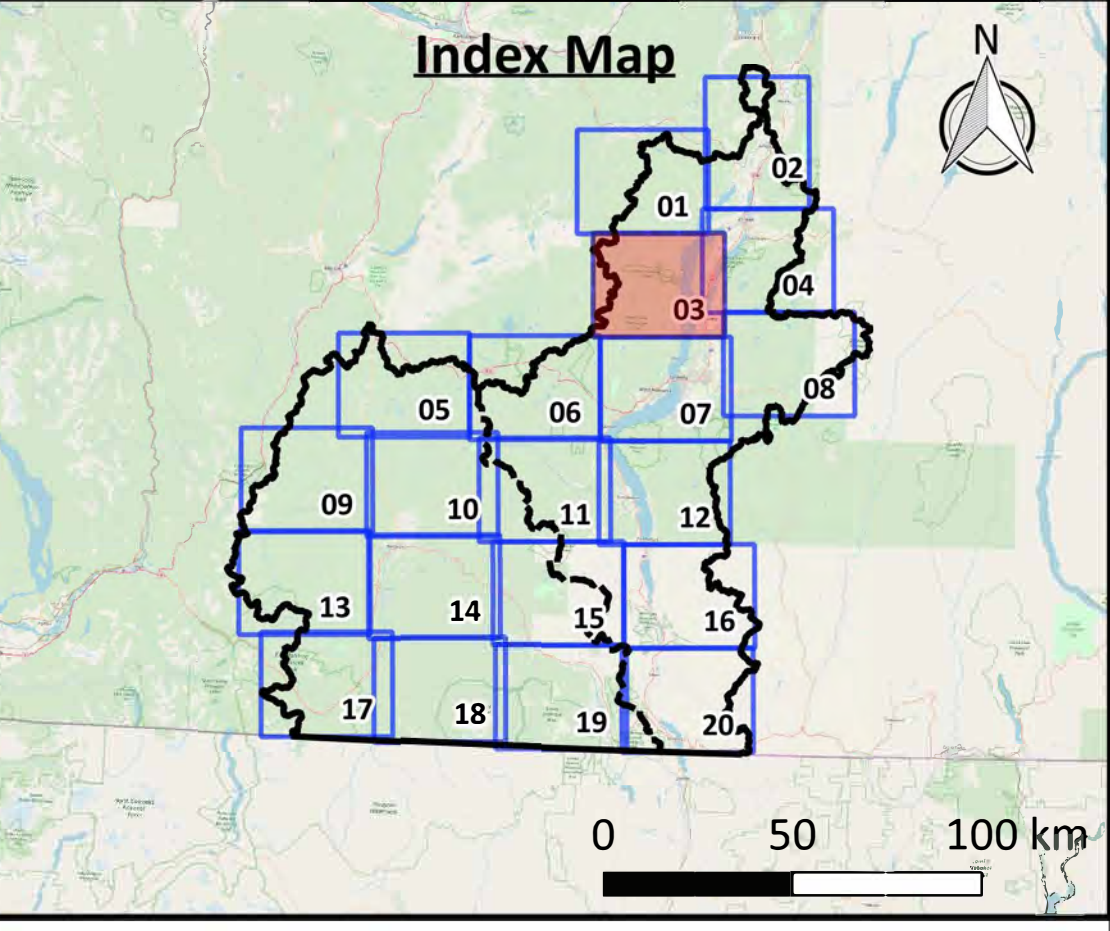
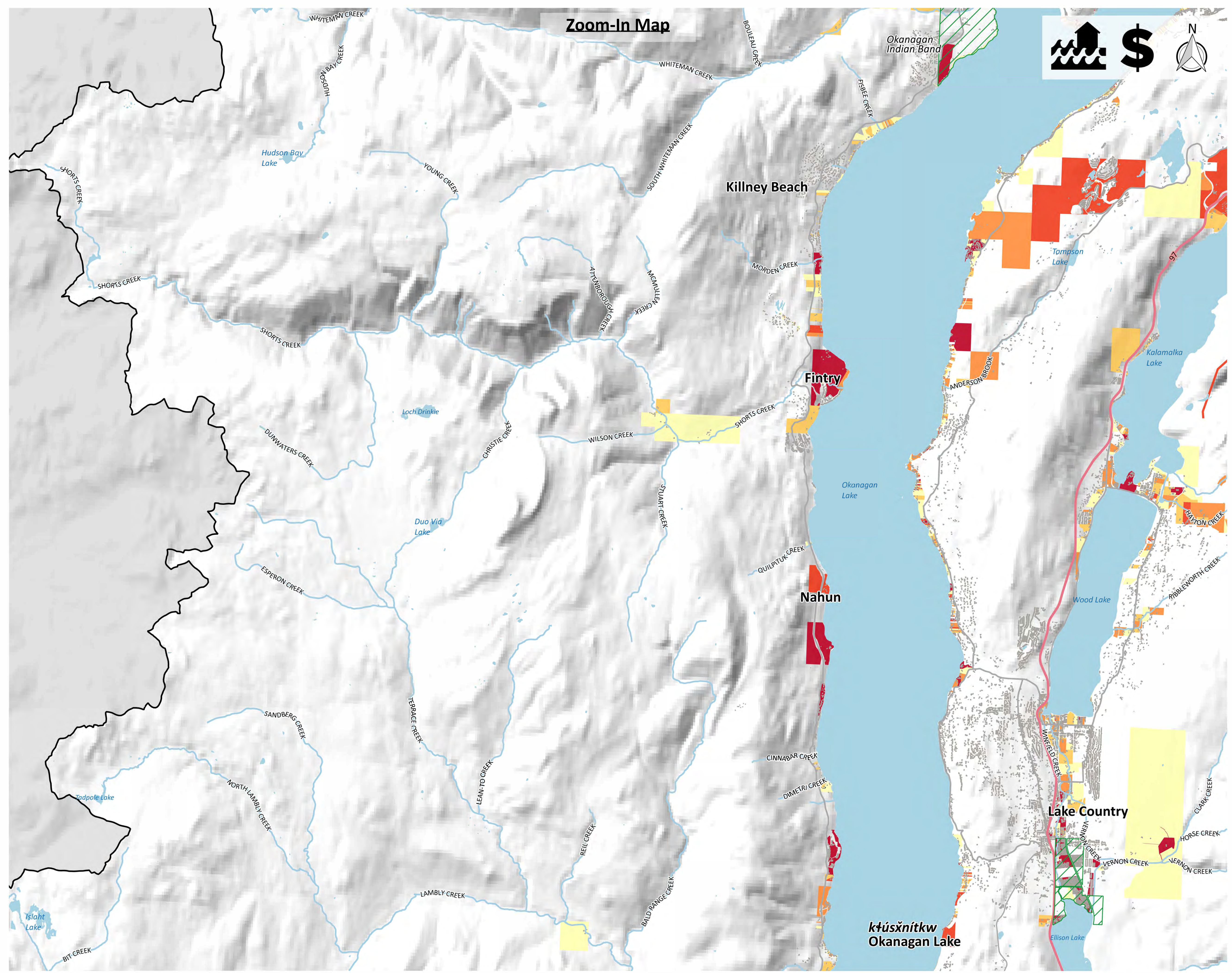
Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 02 of 20

ANSI D - Map No. EC-F-003-002





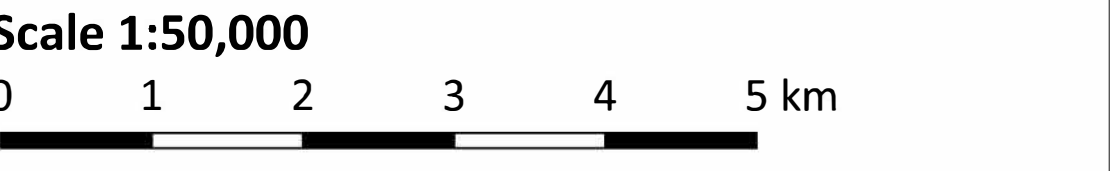
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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Data Sources

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- Land Values: BC Assessment Data and Building Footprints.
- Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
- Sylix Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.

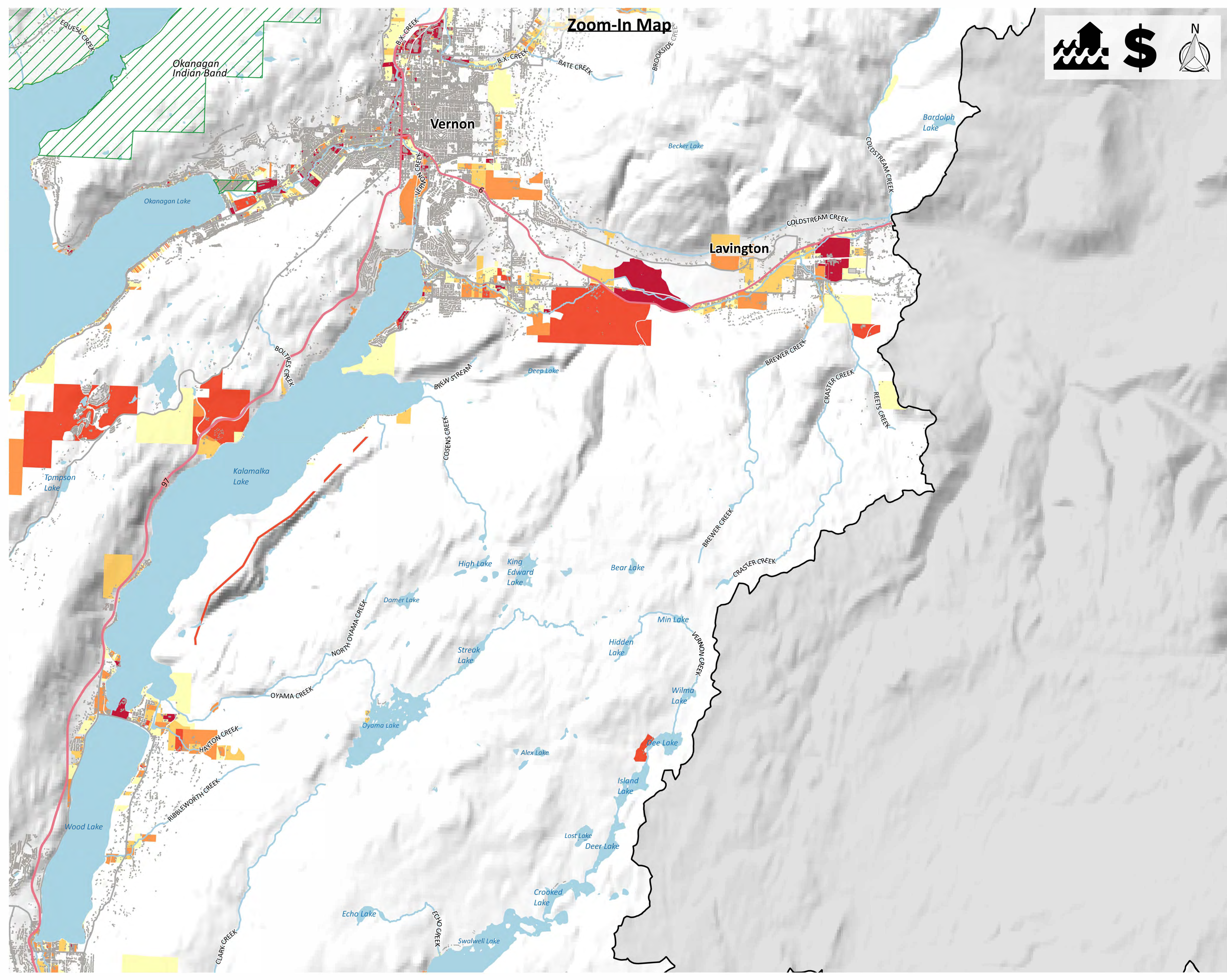


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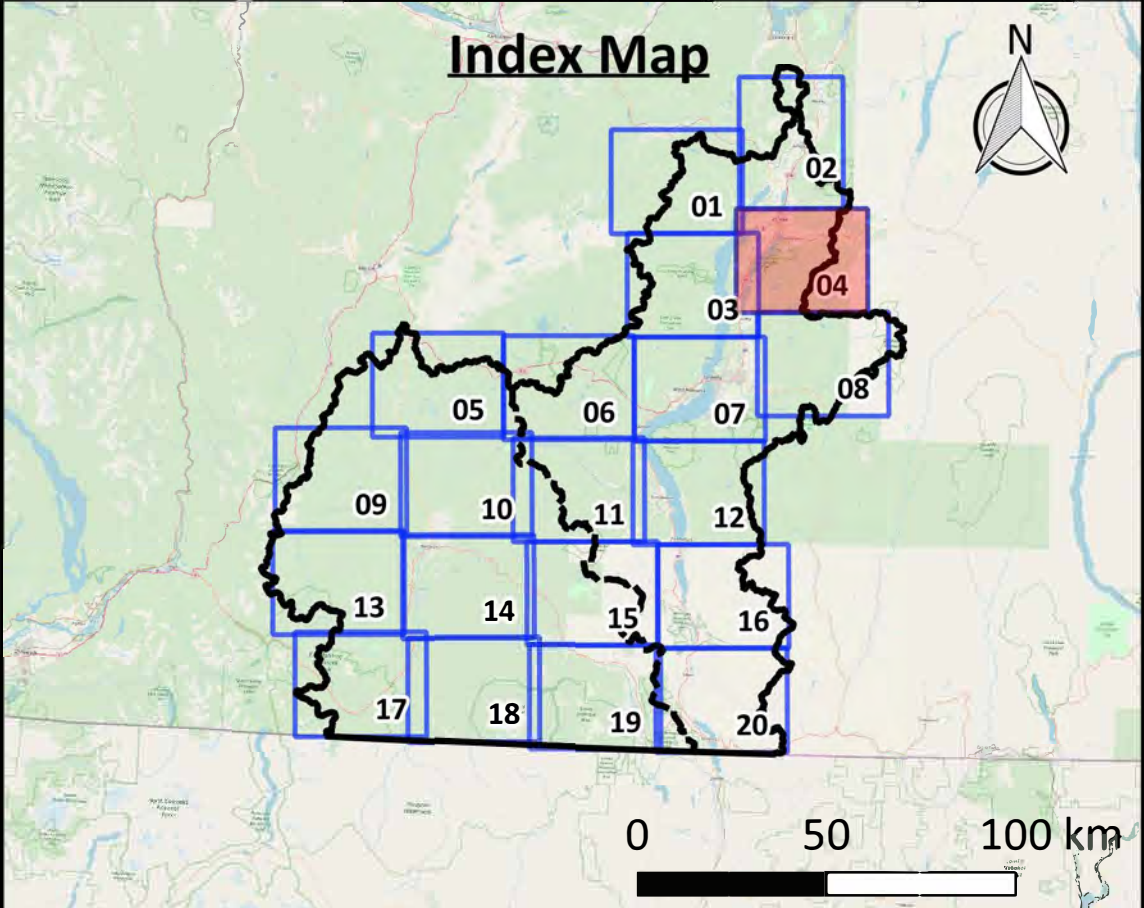
Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$ 250,000 - \$500,000
Watercourses	\$500,000 - \$100,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 03 of 20



Zoom-In Map



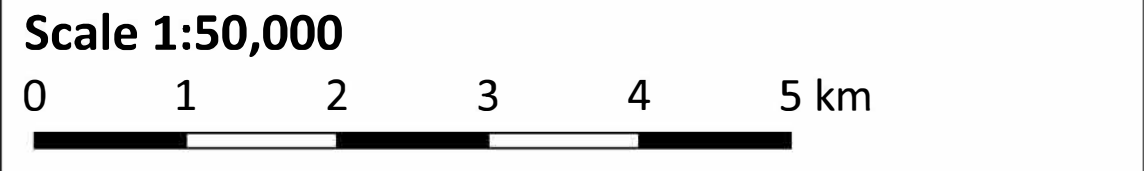
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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4. Sylix Place Names: Okanagan Nation Alliance.
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Legend

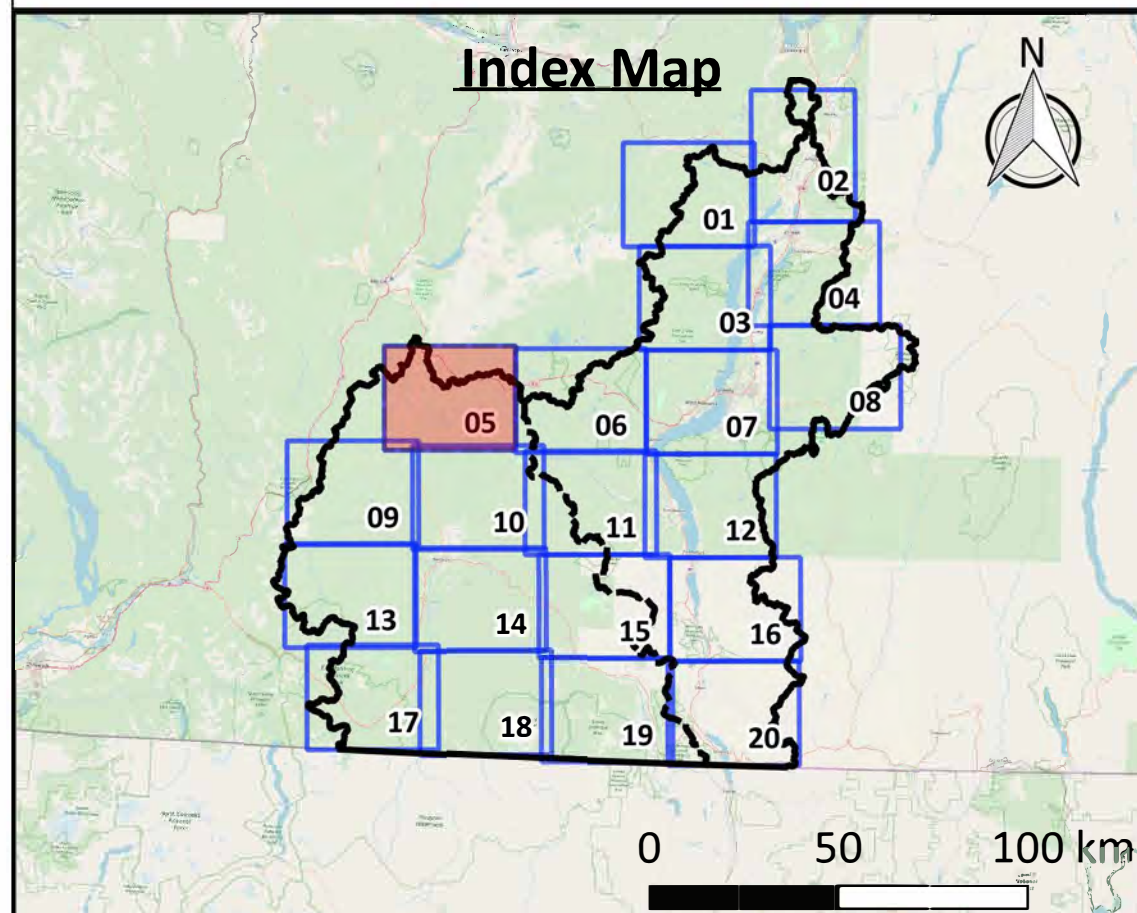
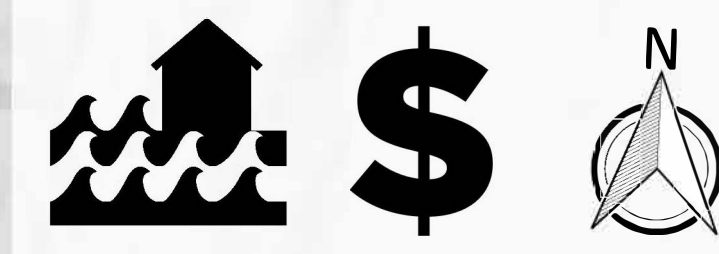
Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 04 of 20

ANSI D - Map No. EC-F-003-004

Zoom-In Map



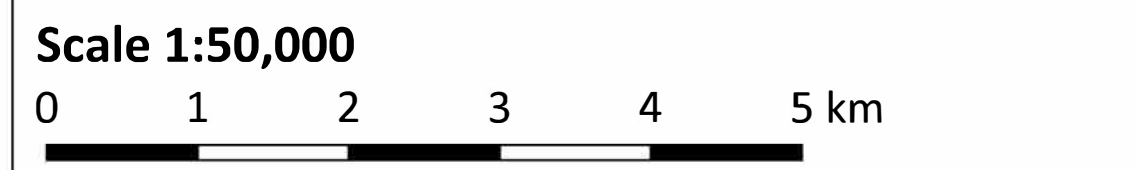
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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Data Sources

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- Land Values: BC Assessment Data and Building Footprints.
- Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
- Sylix Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



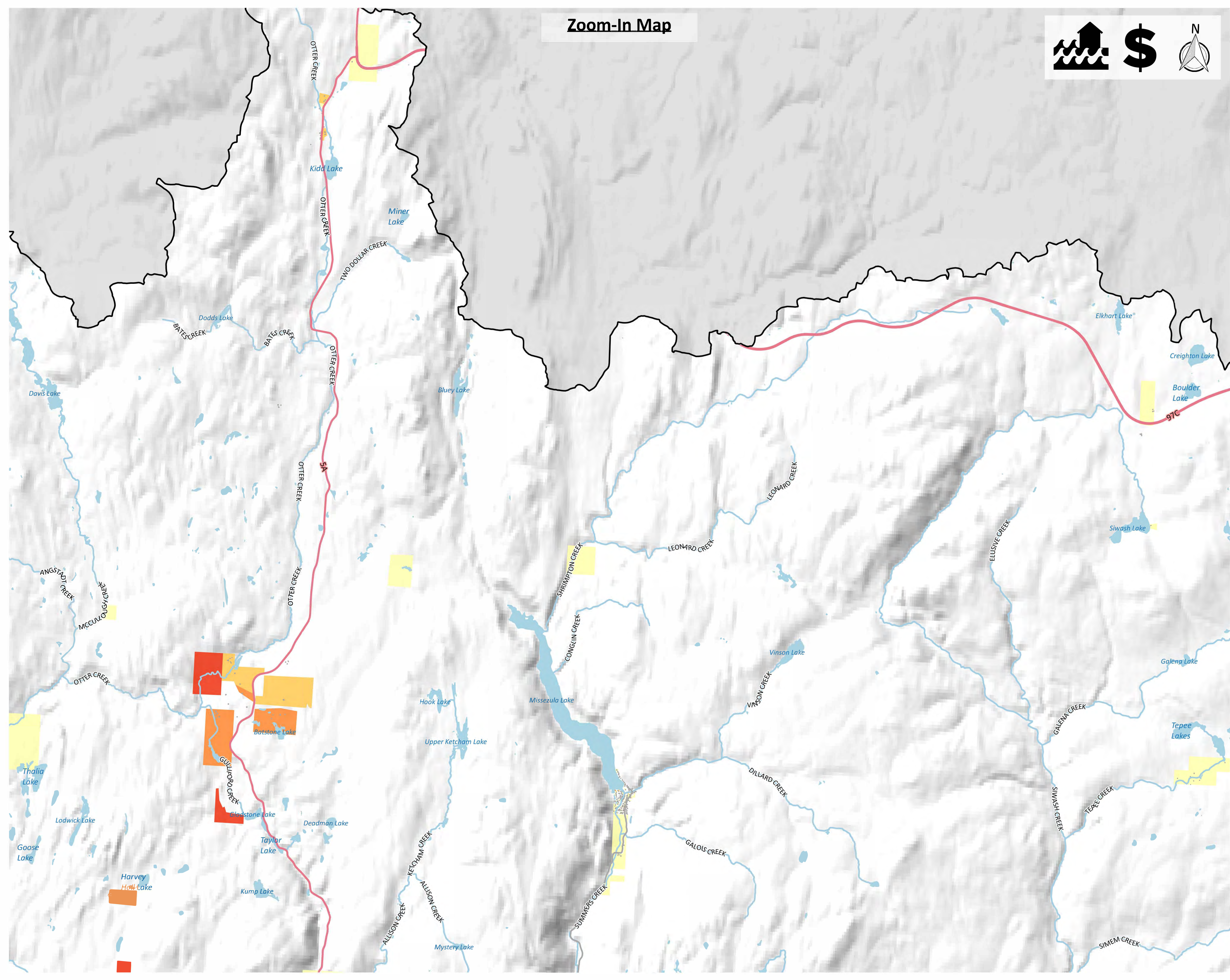
Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

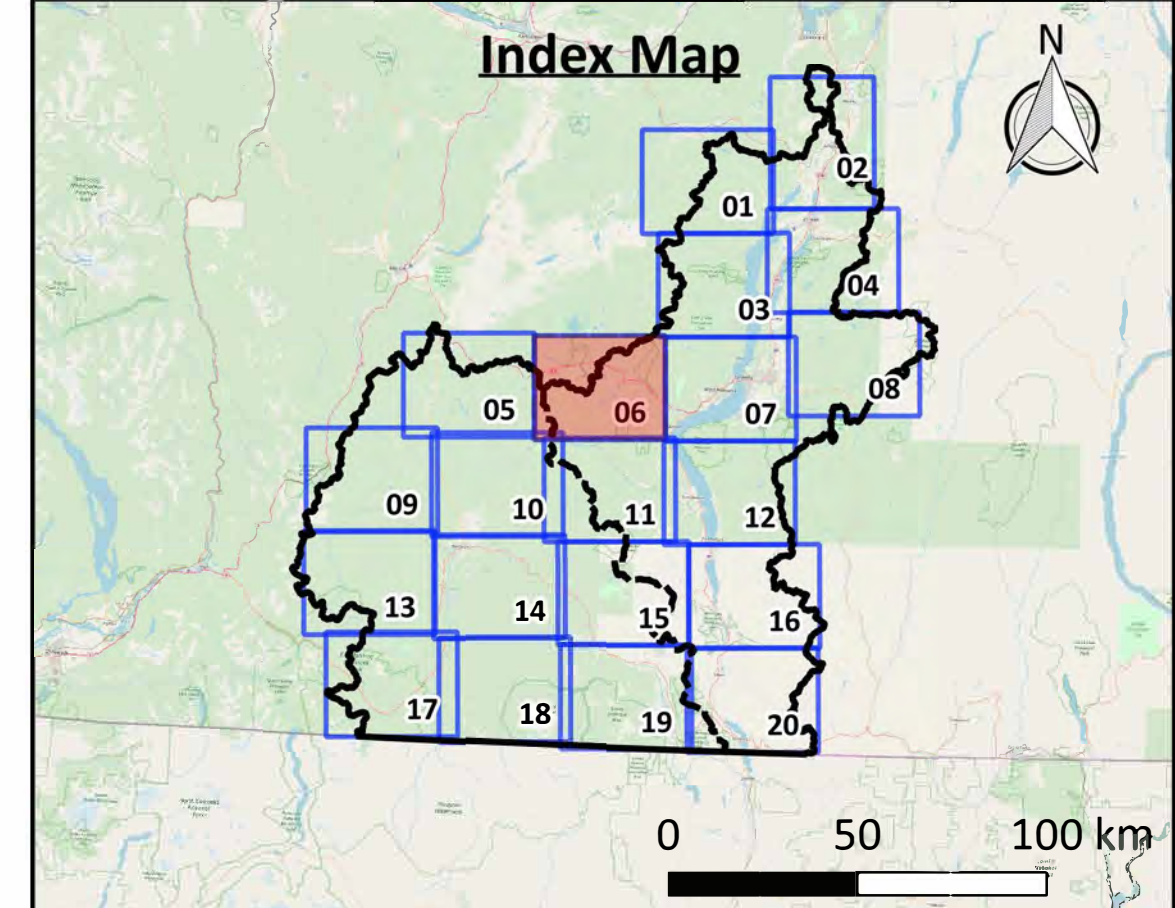
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 05 of 20

ANSI D - Map No. EC-F-003-005



Zoom-In Map



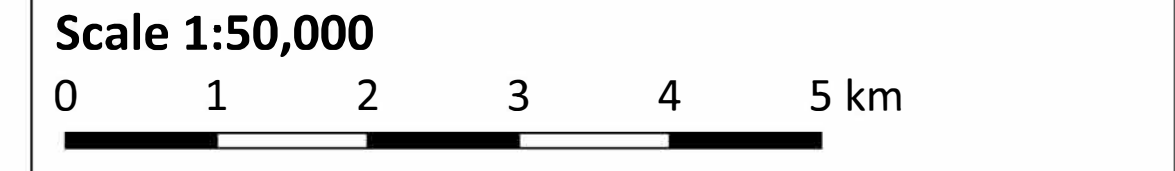
[Click above map tile for Zoom-In map](#)
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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2. Land Values: BC Assessment Data and Building Footprints.
3. Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
4. Sylix Place Names: Okanagan Nation Alliance.
5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



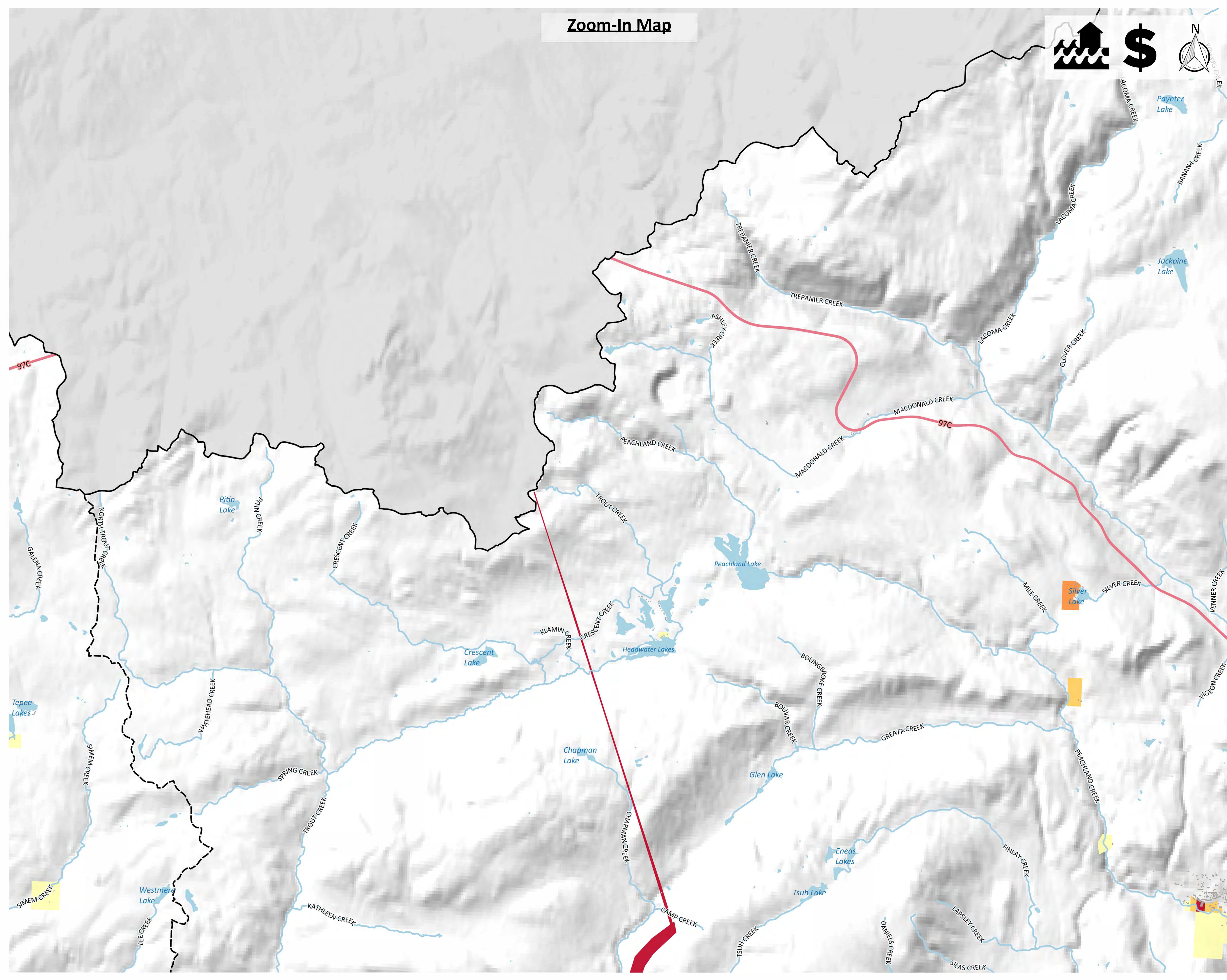
Legend

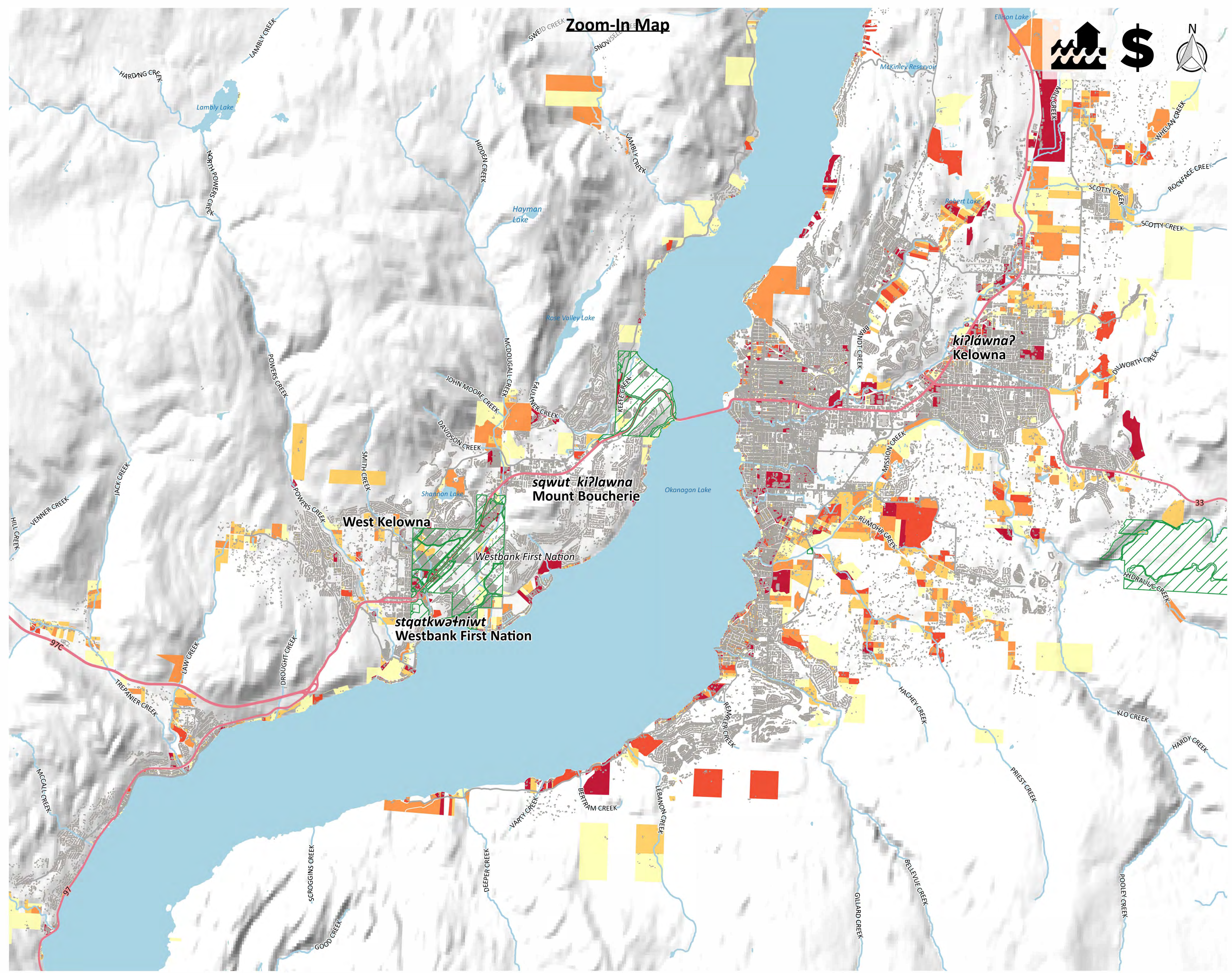
	Watershed Boundary		Affected Assets
	Okanagan-Similkameen Boundary		Property Values
	Canada - US Border		\$1 - \$250,000
	Reserves		\$250,000 - \$500,000
	Lakes		\$500,000 - \$1,000,000
	Watercourses		\$1,000,000 - \$2,000,000
	Highway		\$2,000,000 +
	Major Road		

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 06 of 20

ANSI D - Map No. EC-F-003-006





ebbwater CONSULTING
THOUGHTFUL FLOOD MANAGEMENT

Palmer Environmental Consulting Group Inc.

Sylix
Okanagan Nation Alliance

Index Map

0 50 100 km

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[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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Data Sources

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- Land Values: BC Assessment Data and Building Footprints.
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- Sylix Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.

Scale 1:50,000

0 1 2 3 4 5 km

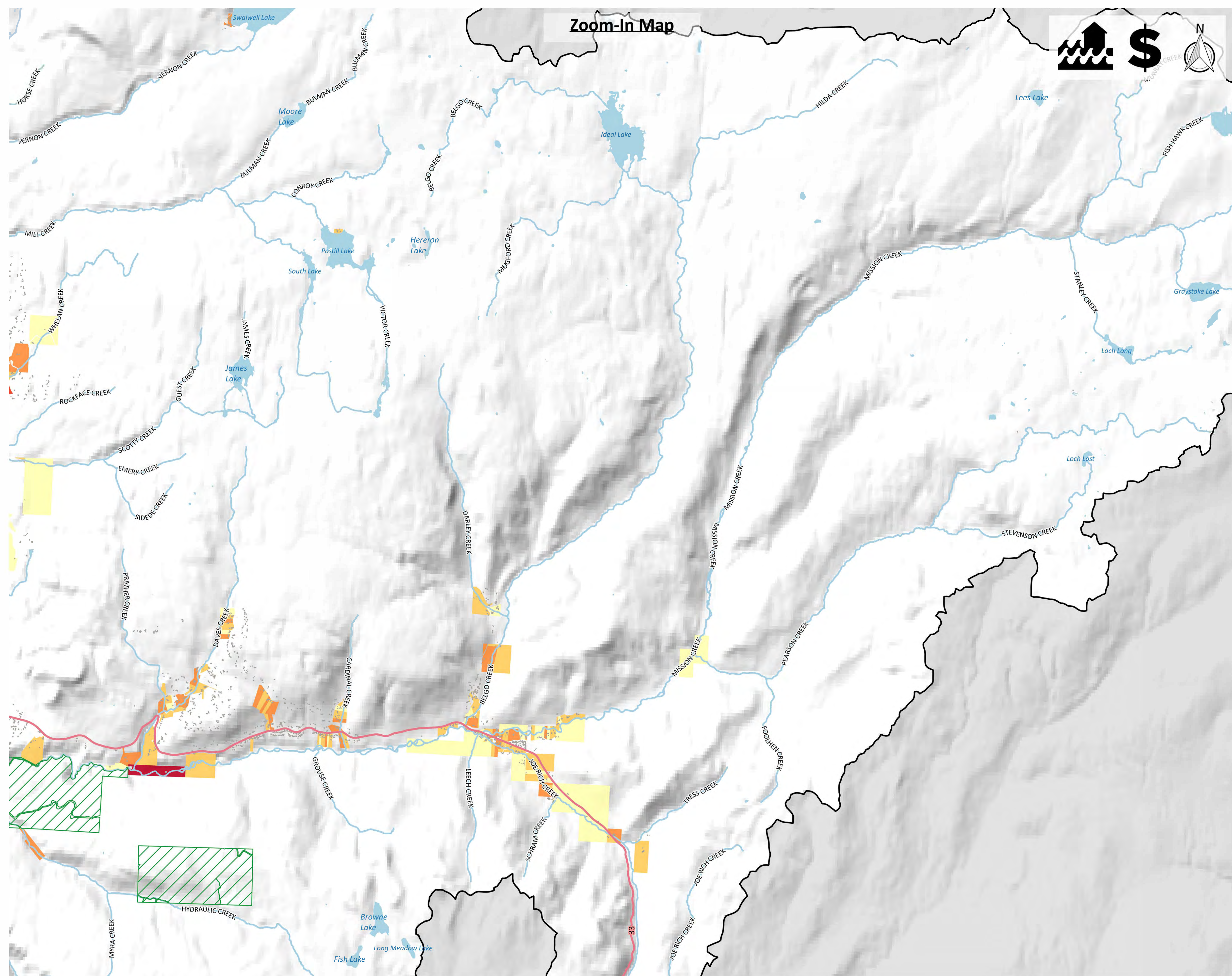
Legend

Background	Affected Assets
— Watershed Boundary	Property Values
- - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▭ Reserves	Red-Orange: \$500,000 - \$1,000,000
— Lakes	Red: \$1,000,000 - \$2,000,000
— Watercourses	Dark Red: \$2,000,000 +
— Highway	
— Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 07 of 20

ANSI D - Map No. EC-F-003-007



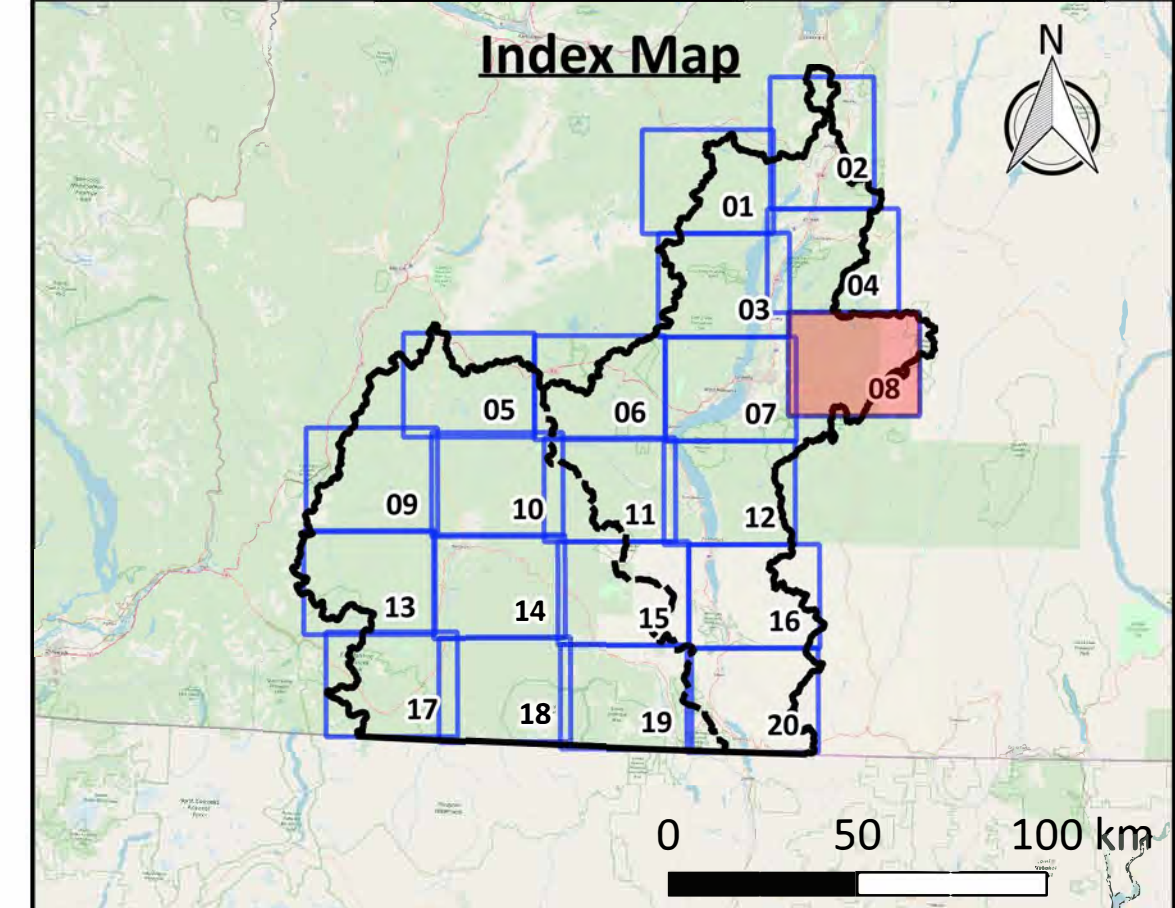
Zoom-In Map



ebbwater CONSULTING
THOUGHTFUL FLOOD MANAGEMENT

Palmer Environmental Consulting Group Inc.

Sylix Okanagan Nation Alliance



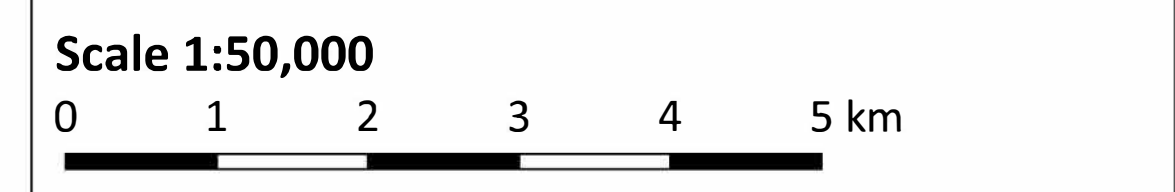
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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2. Land Values: BC Assessment Data and Building Footprints.
3. Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
4. Sylix Place Names: Okanagan Nation Alliance.
5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



Legend

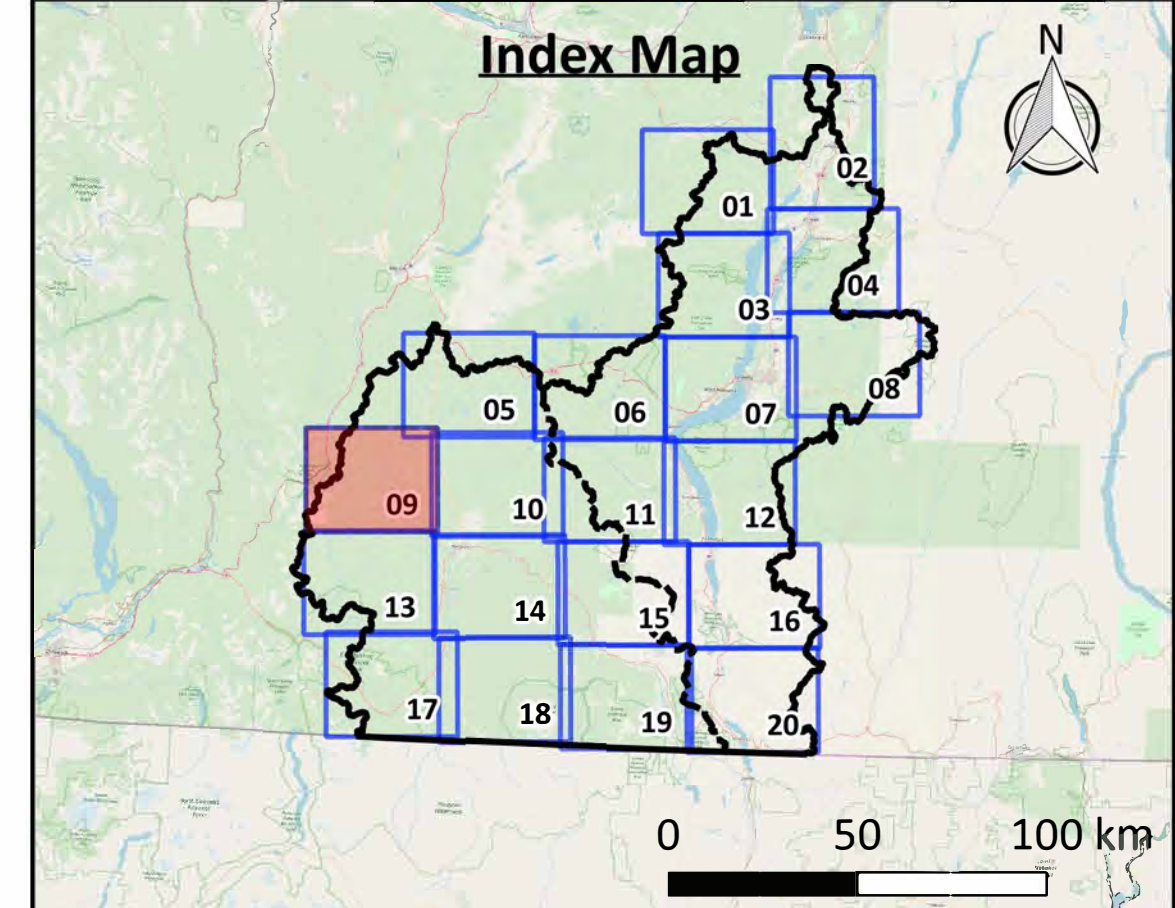
Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	Property Values
Canada - US Border	\$1 - \$250,000
Reserves	\$250,000 - \$500,000
Lakes	\$500,000 - \$1,000,000
Watercourses	\$1,000,000 - \$2,000,000
Highway	\$2,000,000 +
Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 08 of 20

ANSI D - Map No. EC-F-003-008

Zoom-In Map



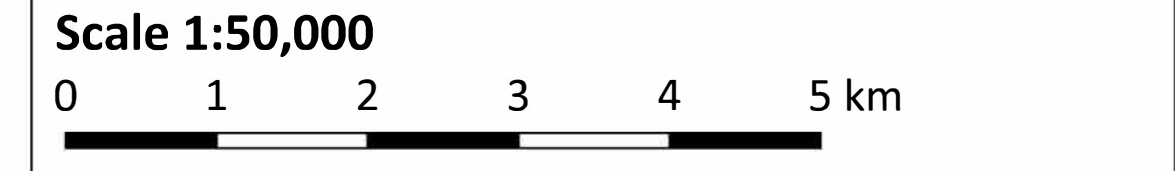
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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Data Sources

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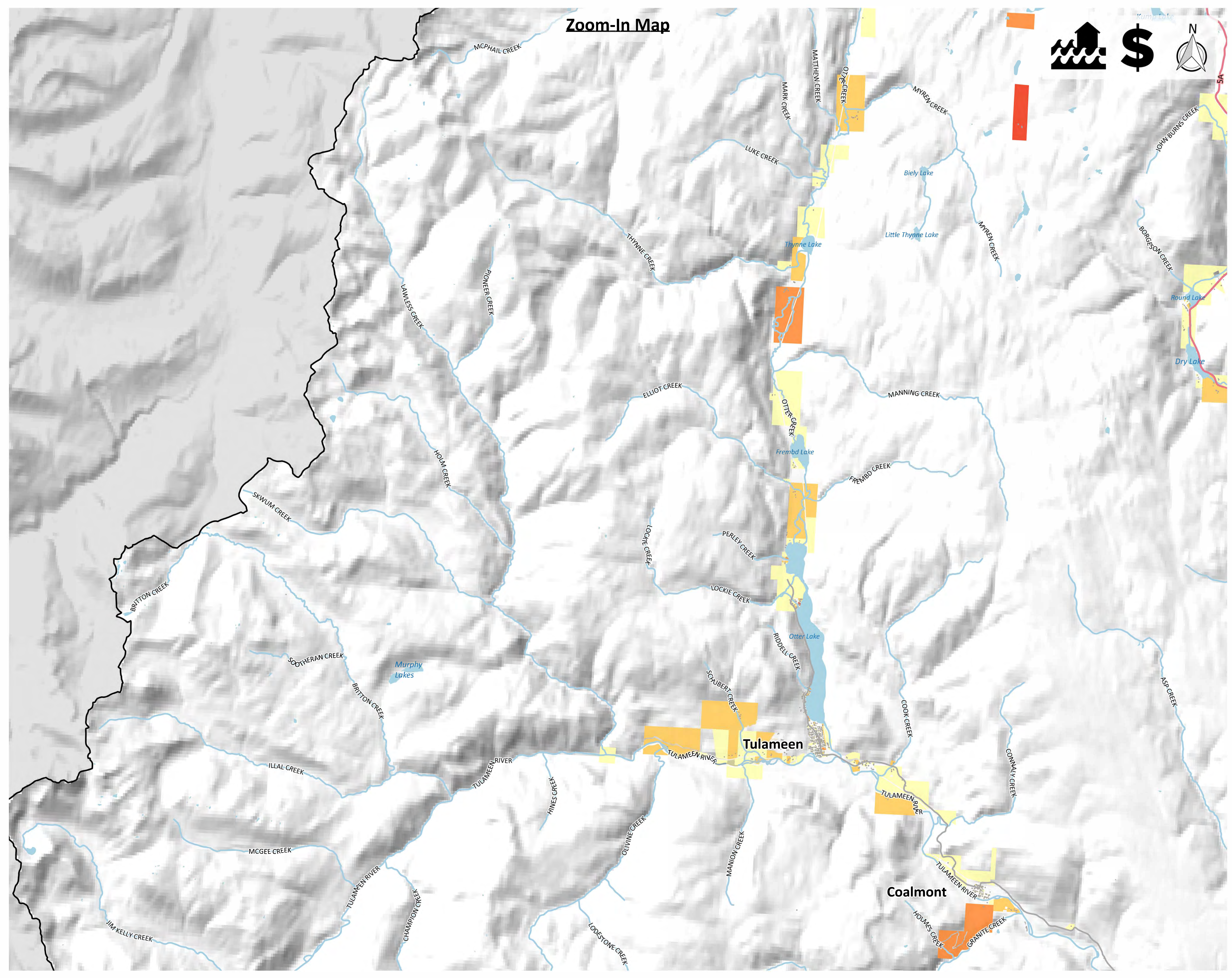
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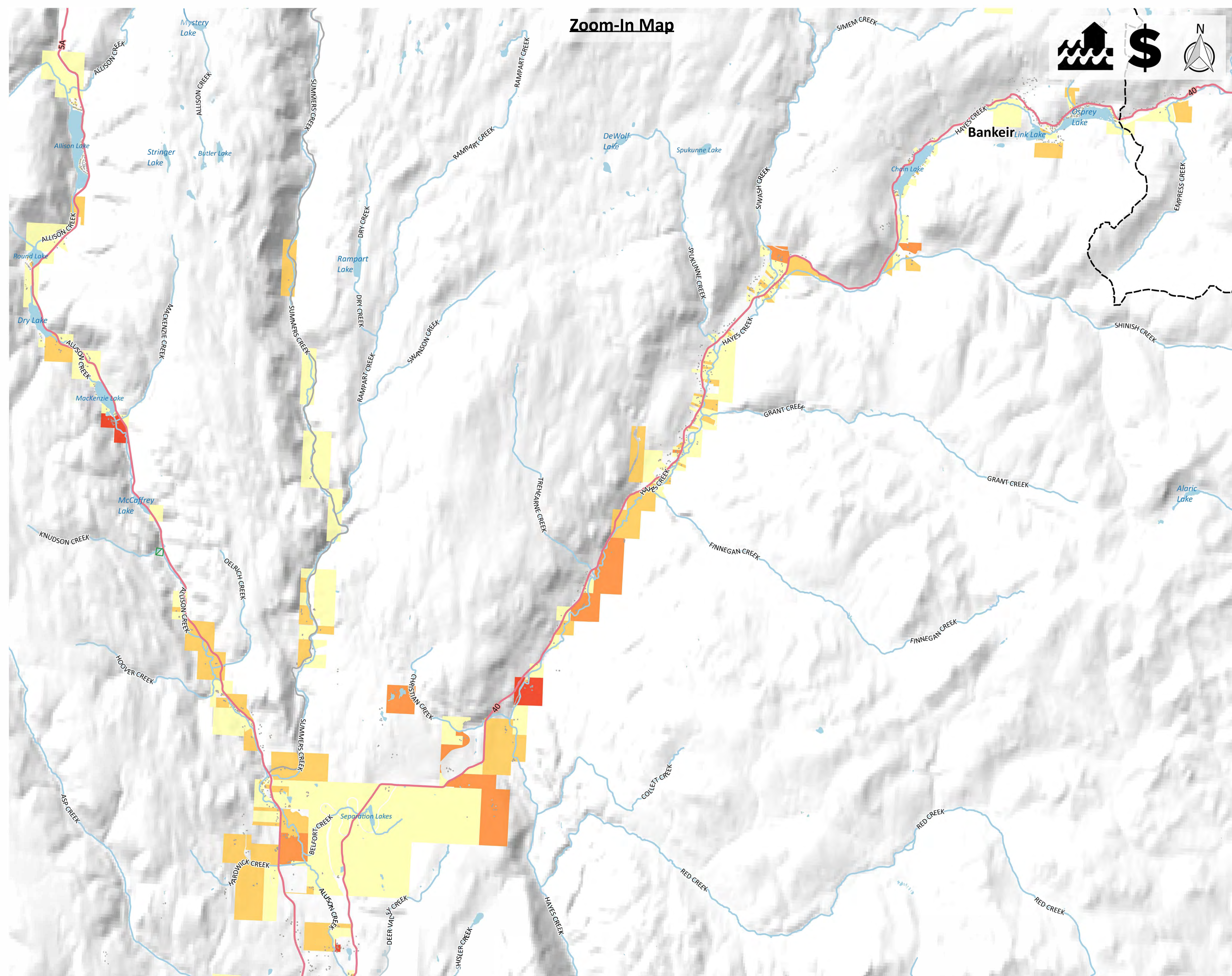
Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
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ANSI D - Map No. EC-F-003-009





ebbwater CONSULTING
THOUGHTFUL FLOOD MANAGEMENT

Sylix
Okanagan Nation Alliance

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Index Map

0 50 100 km

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5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.

Scale 1:50,000

0 1 2 3 4 5 km

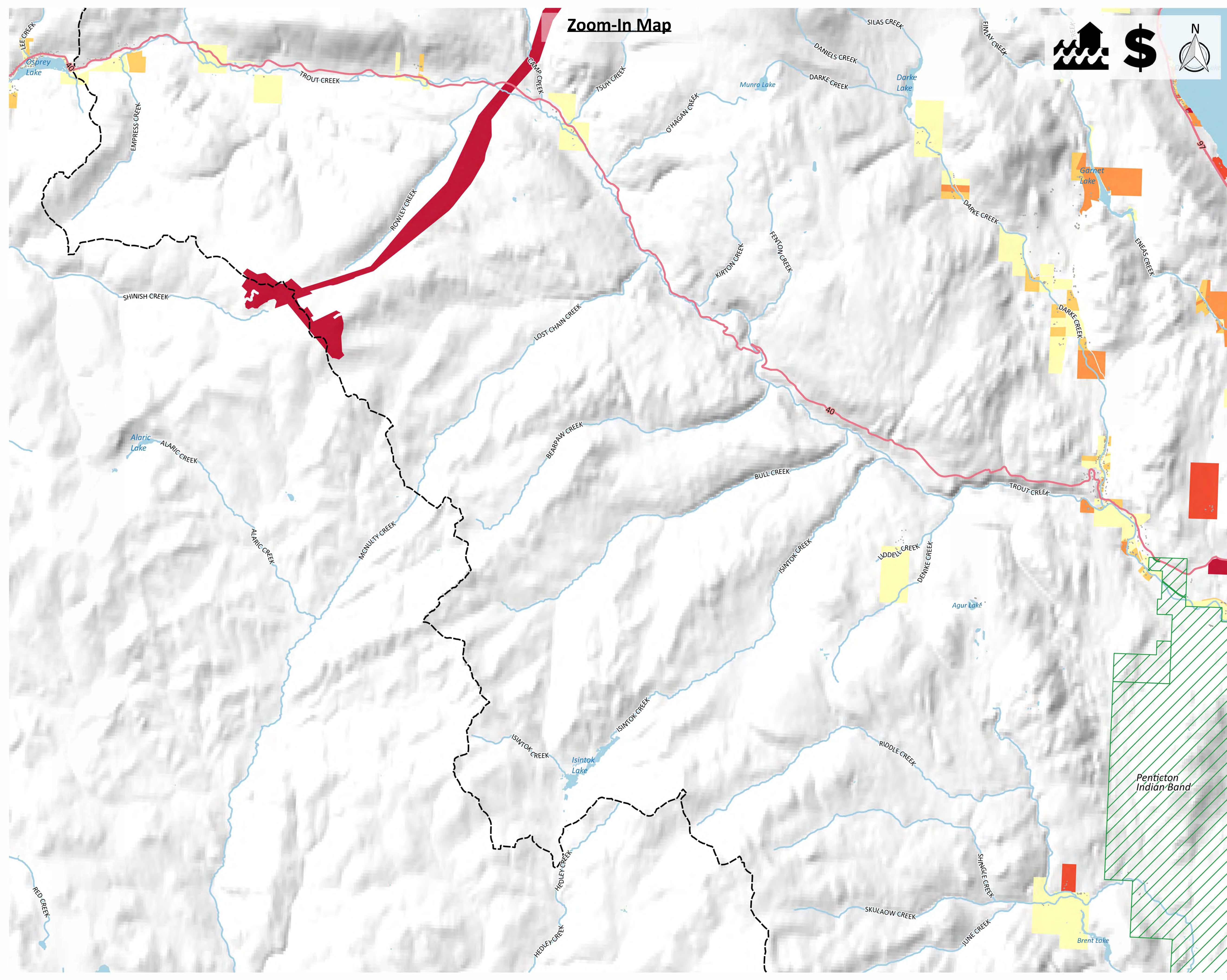
Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

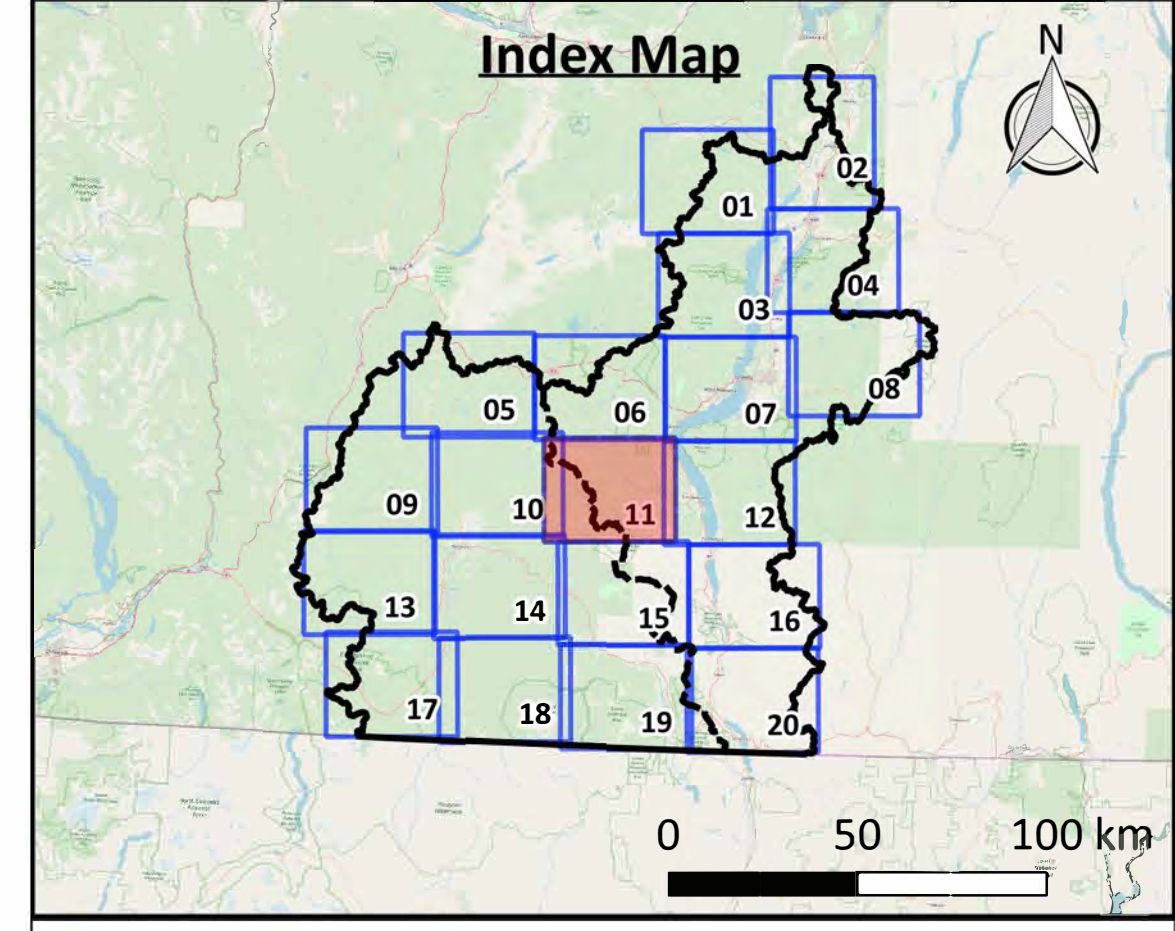
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
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ANSI D - Map No. EC-F-003-010



Zoom-In Map



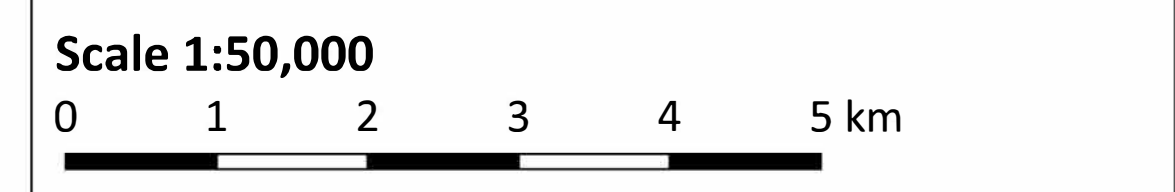
[Click above map tile for Zoom-In map](#)
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[Click here to return to Similkameen map](#)

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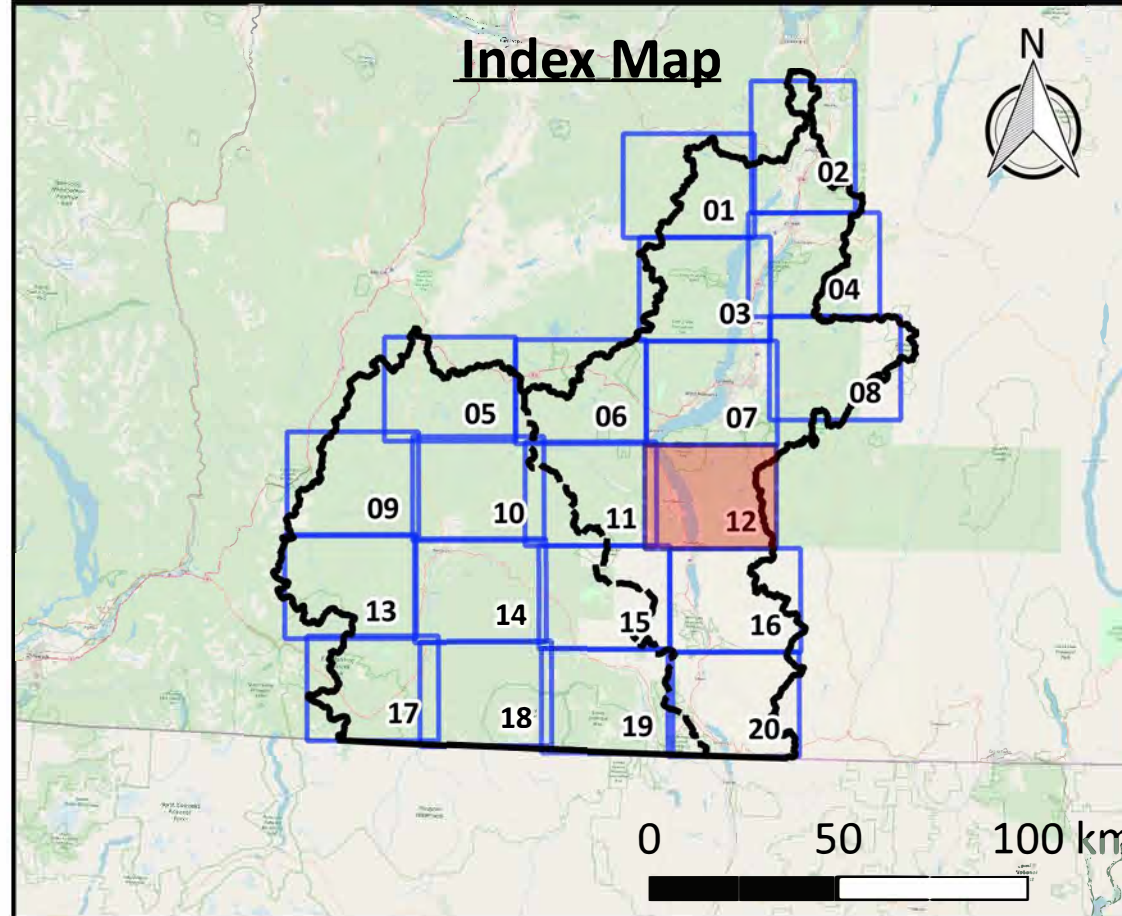
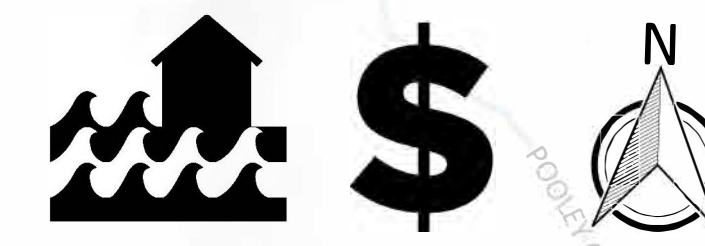
Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
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Zoom-In Map



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Scale 1:50,000



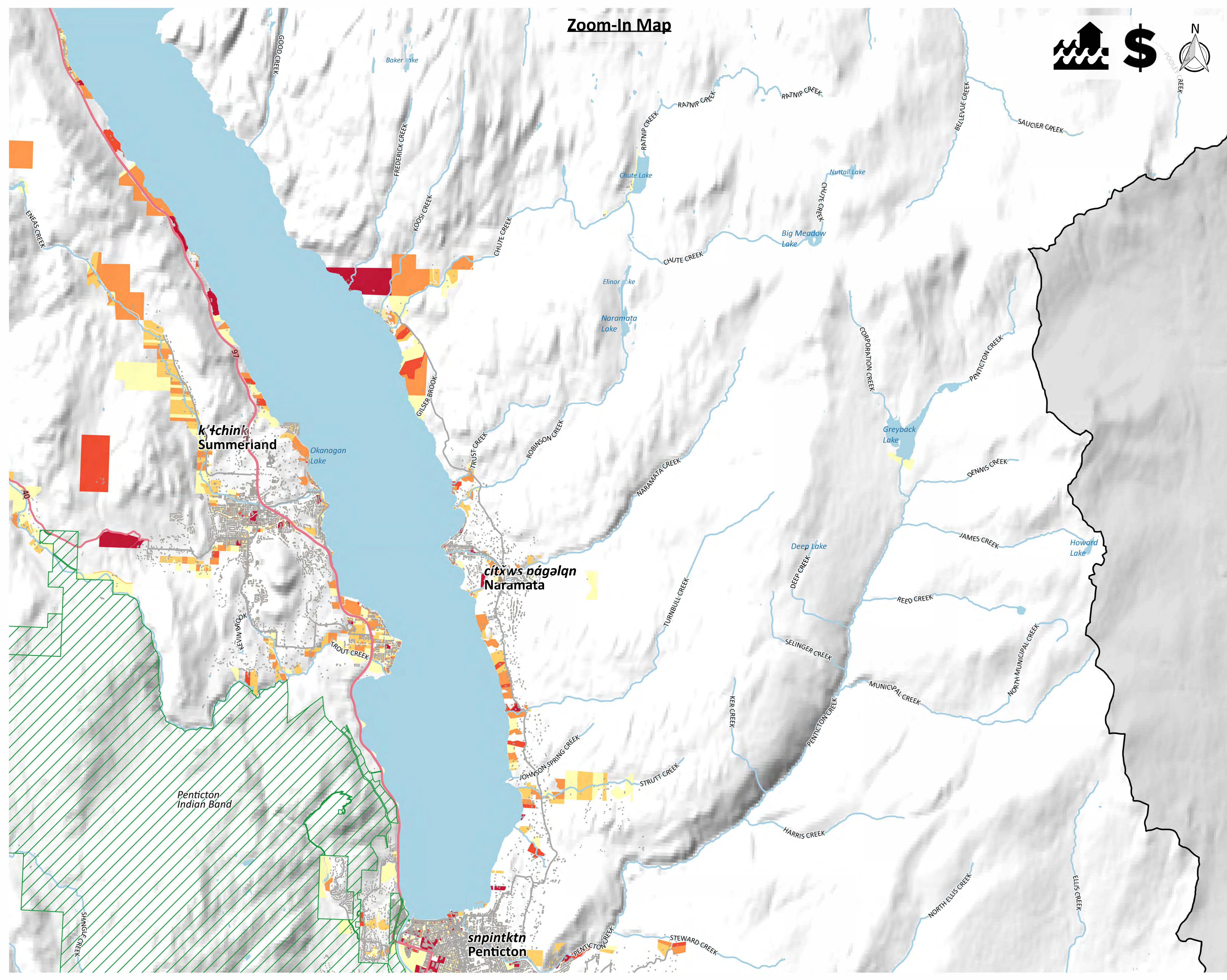
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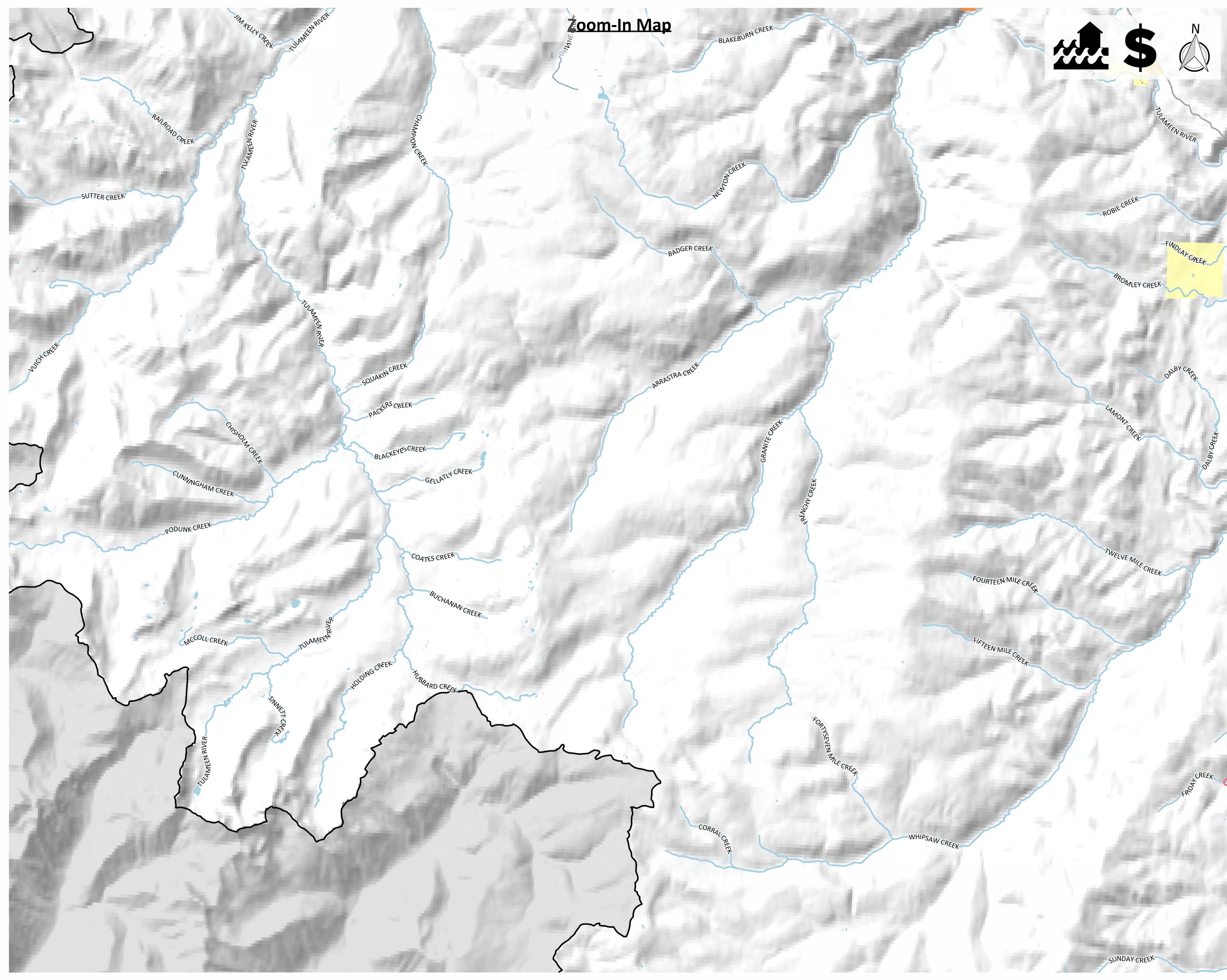
Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

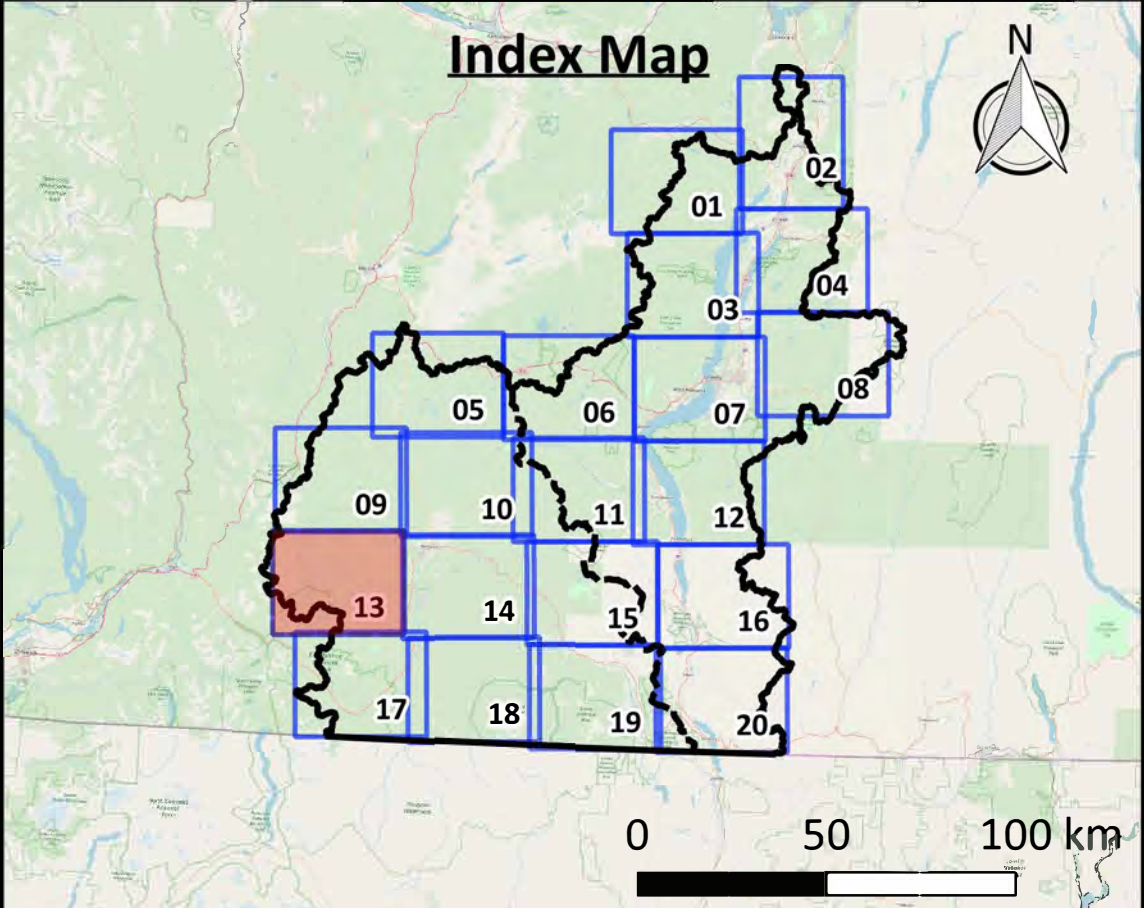
Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
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ANSI D - Map No. EC-F-003-012





Zoom-In Map



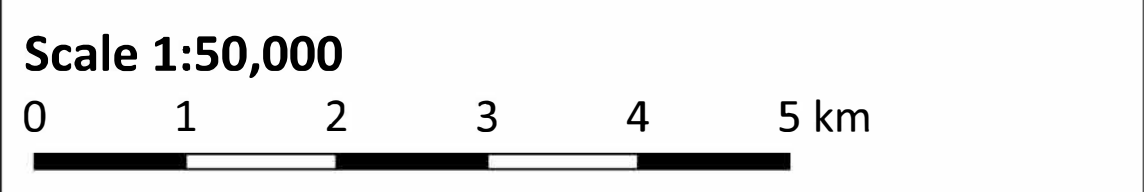
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Data Sources

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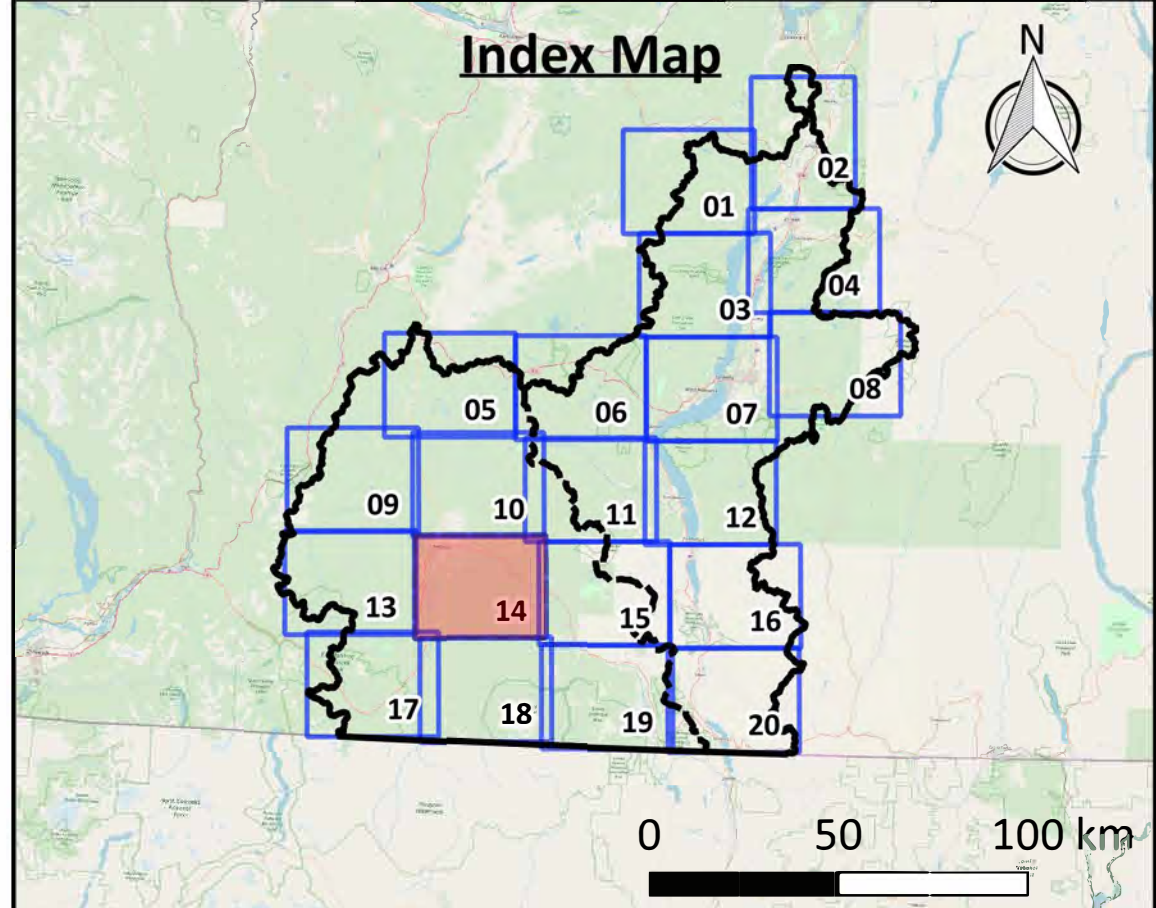
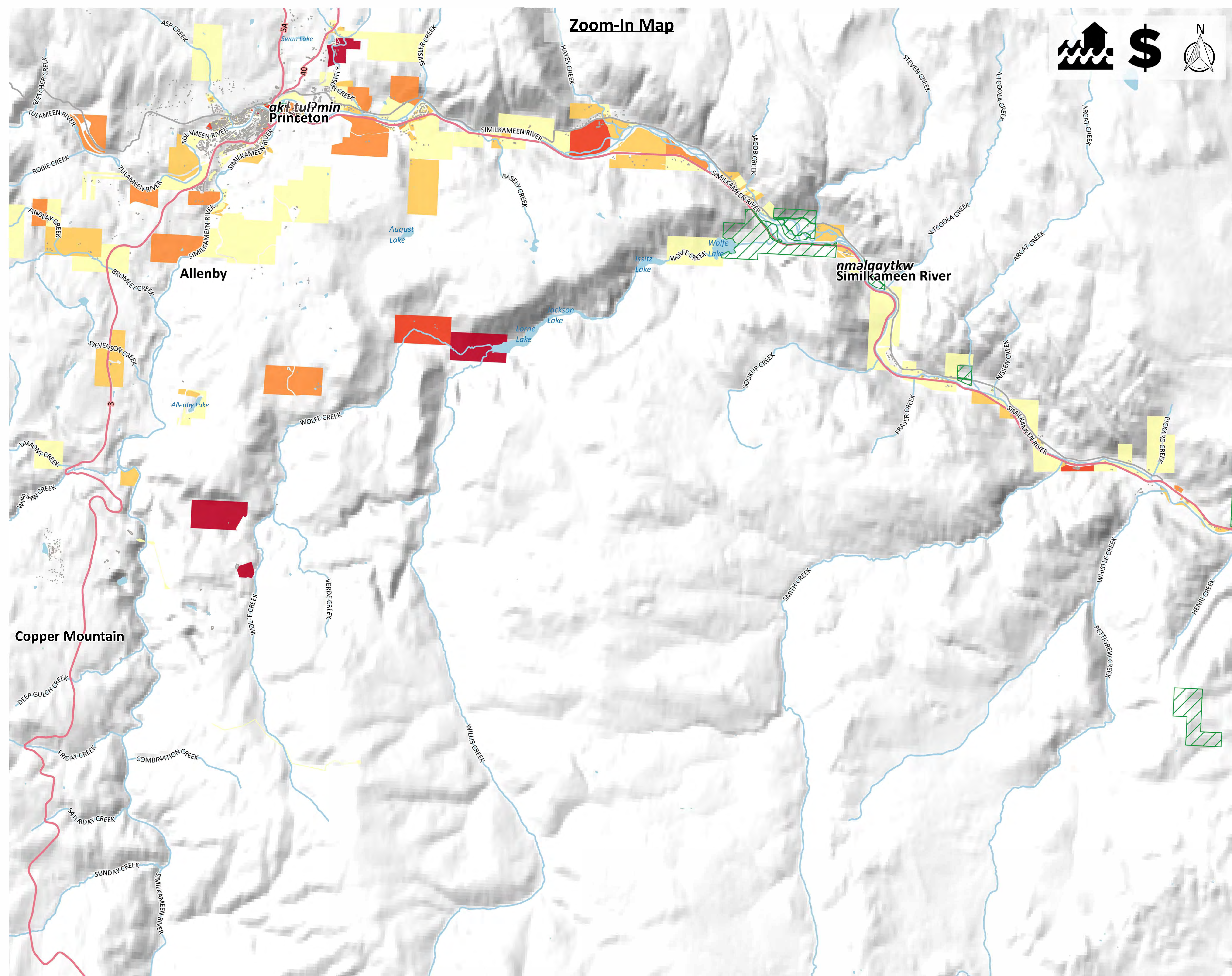
Legend

Watershed Boundary	Affected Assets Property Values \$1 - \$250,000
Okanagan-Similkameen Boundary	Affected Assets Property Values \$250,000 - \$500,000
Canada - US Border	Affected Assets Property Values \$500,000 - \$1,000,000
Reserves	Affected Assets Property Values \$1,000,000 - \$2,000,000
Lakes	Affected Assets Property Values \$2,000,000 +
Watercourses	
Highway	
Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
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ANSI D - Map No. EC-F-003-013



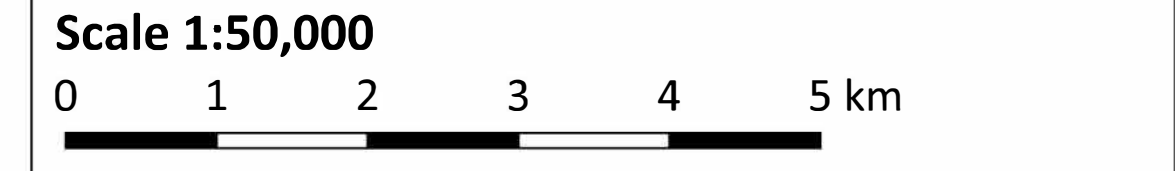
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Data Sources

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Legend

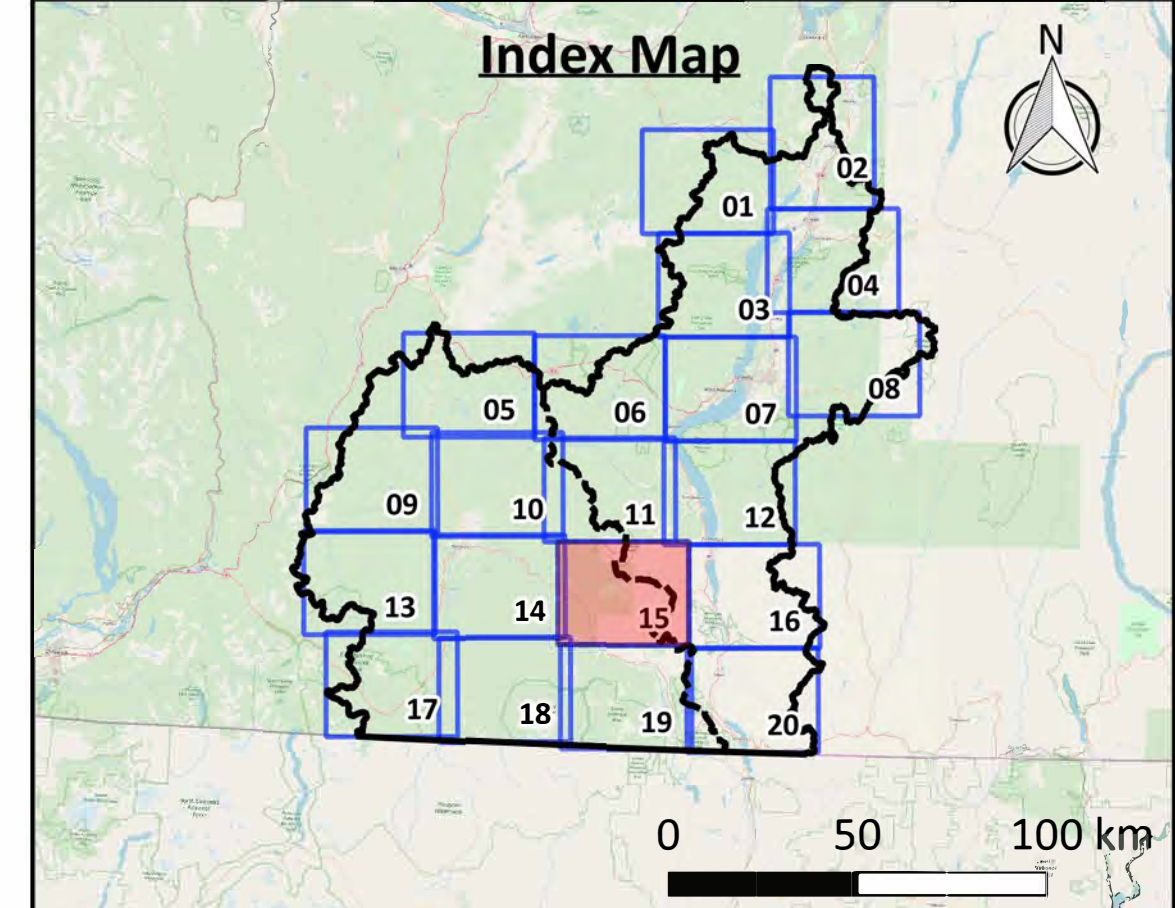
Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
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ANSI D - Map No. EC-F-003-014

Zoom-In Map



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Data Sources

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Scale 1:50,000

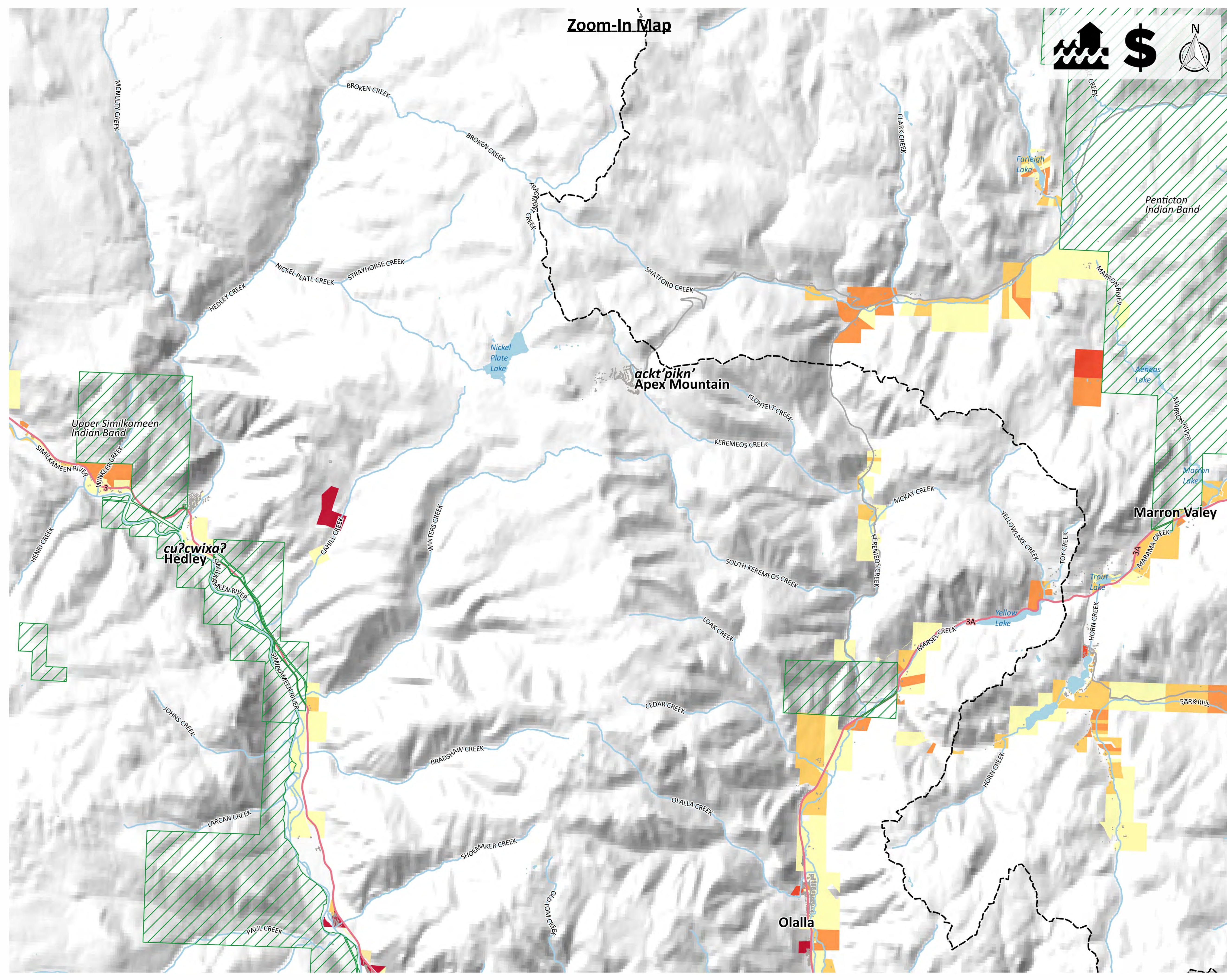
Legend

Watershed Boundary	Affected Assets Property Values
Okanagan-Similkameen Boundary	
Boundary	\$1 - \$250,000
Canada - US Border	\$250,000 - \$500,000
Reserves	\$500,000 - \$1,000,000
Lakes	\$1,000,000 - \$2,000,000
Watercourses	\$2,000,000 +
Highway	
Major Road	

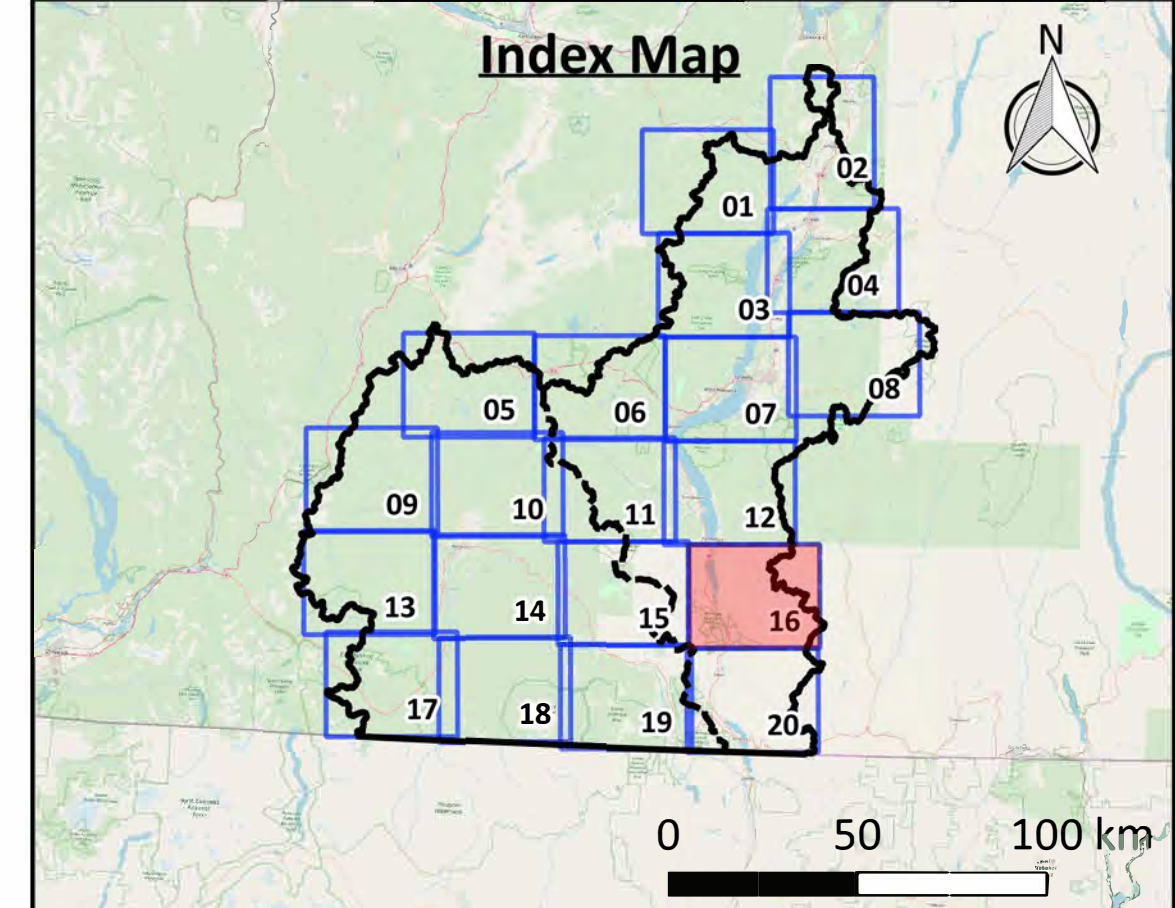
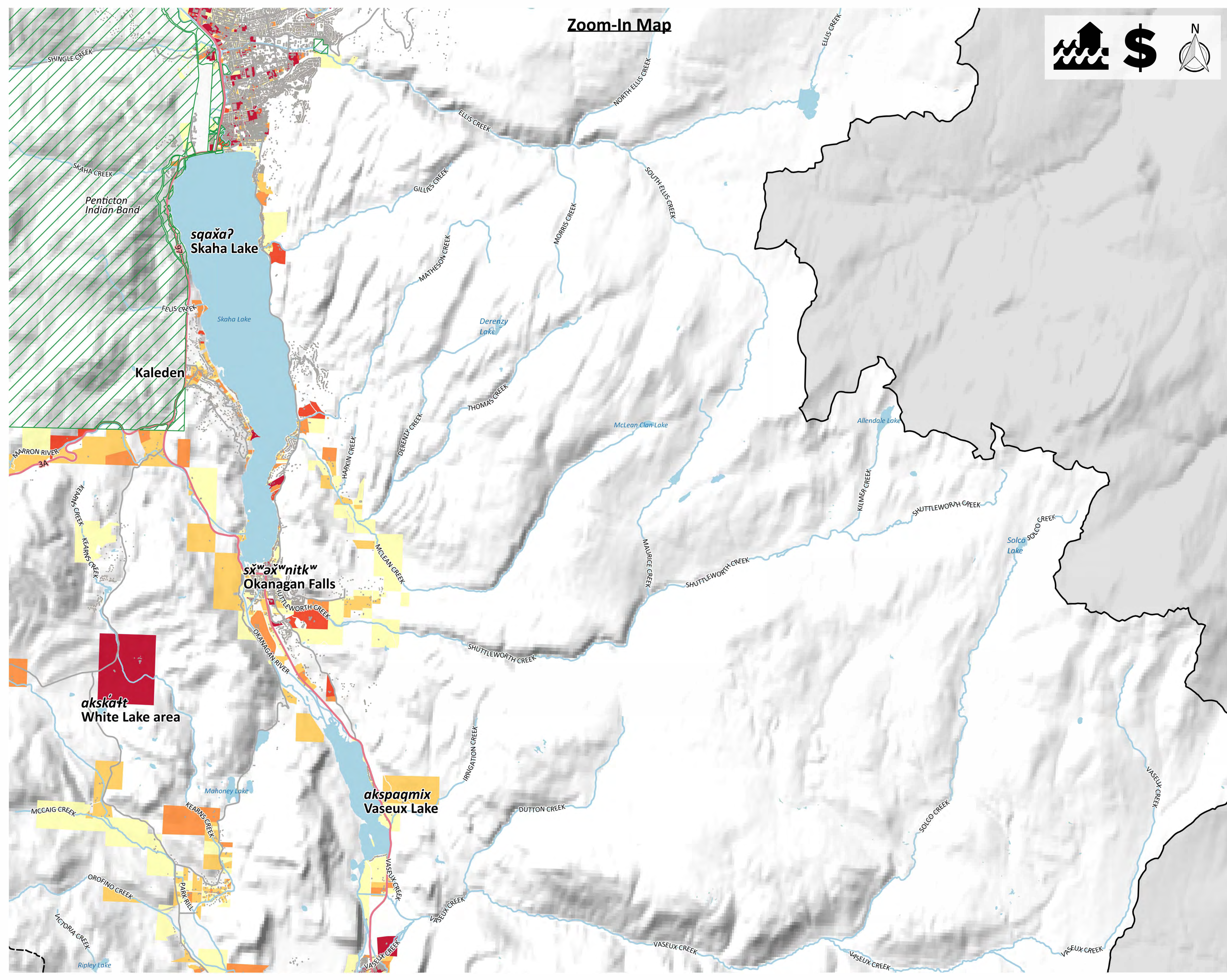
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
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ANSI D - Map No. EC-F-003-015



Zoom-In Map



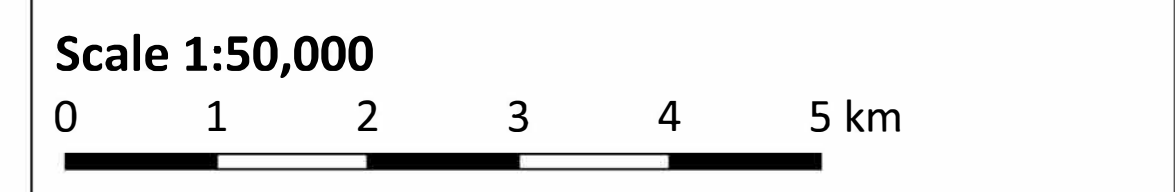
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Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

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Zoom-In Map



Index Map

0 50 100 km

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Scale 1:50,000

0 1 2 3 4 5 km

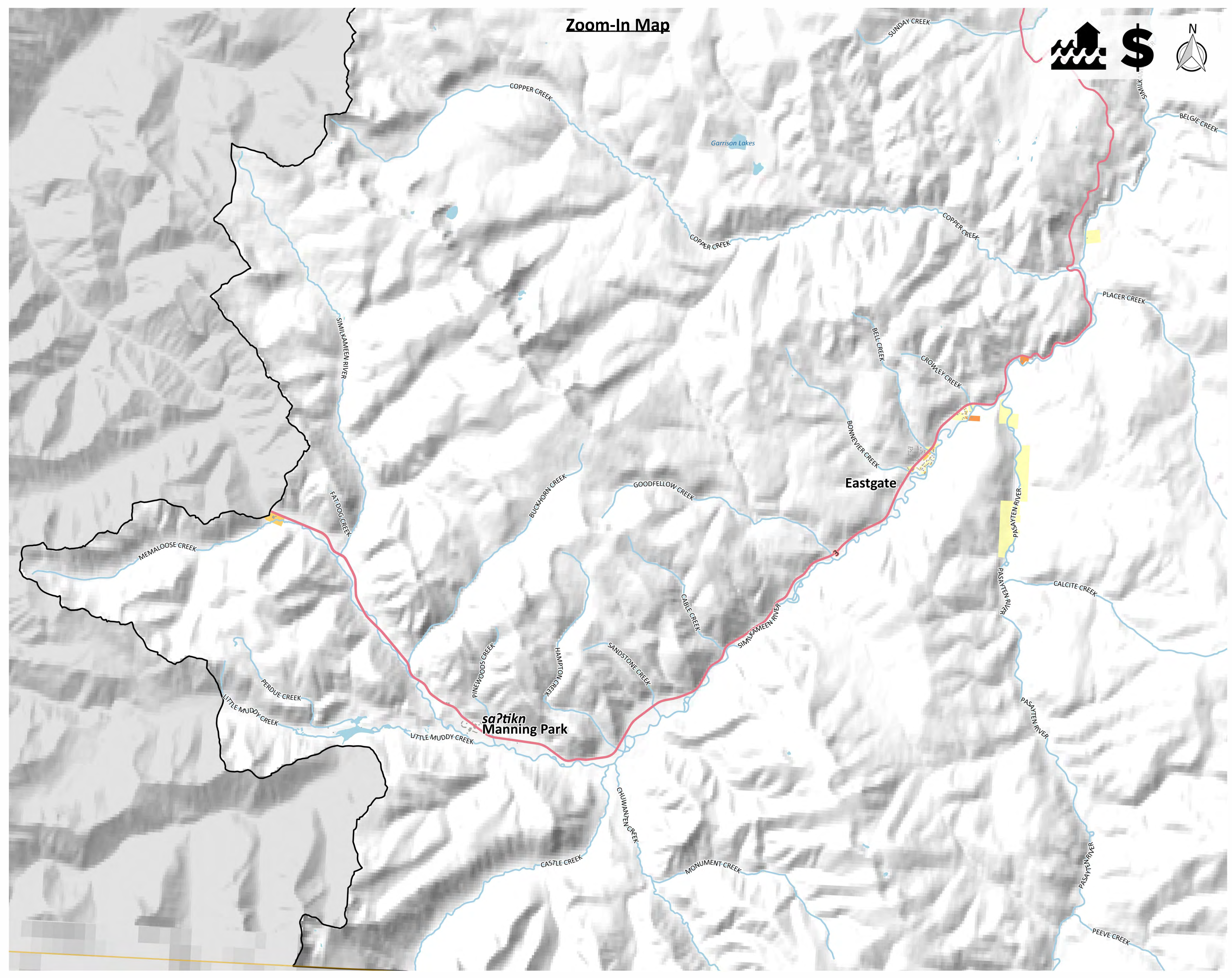
Legend

	Watershed Boundary		Affected Assets
	Okanagan-Similkameen Boundary		Property Values
	Canada - US Border		\$1 - \$250,000
	Reserves		\$250,000 - \$500,000
	Lakes		\$500,000 - \$1,000,000
	Watercourses		\$1,000,000 - \$2,000,000
	Highway		\$2,000,000 +
	Major Road		

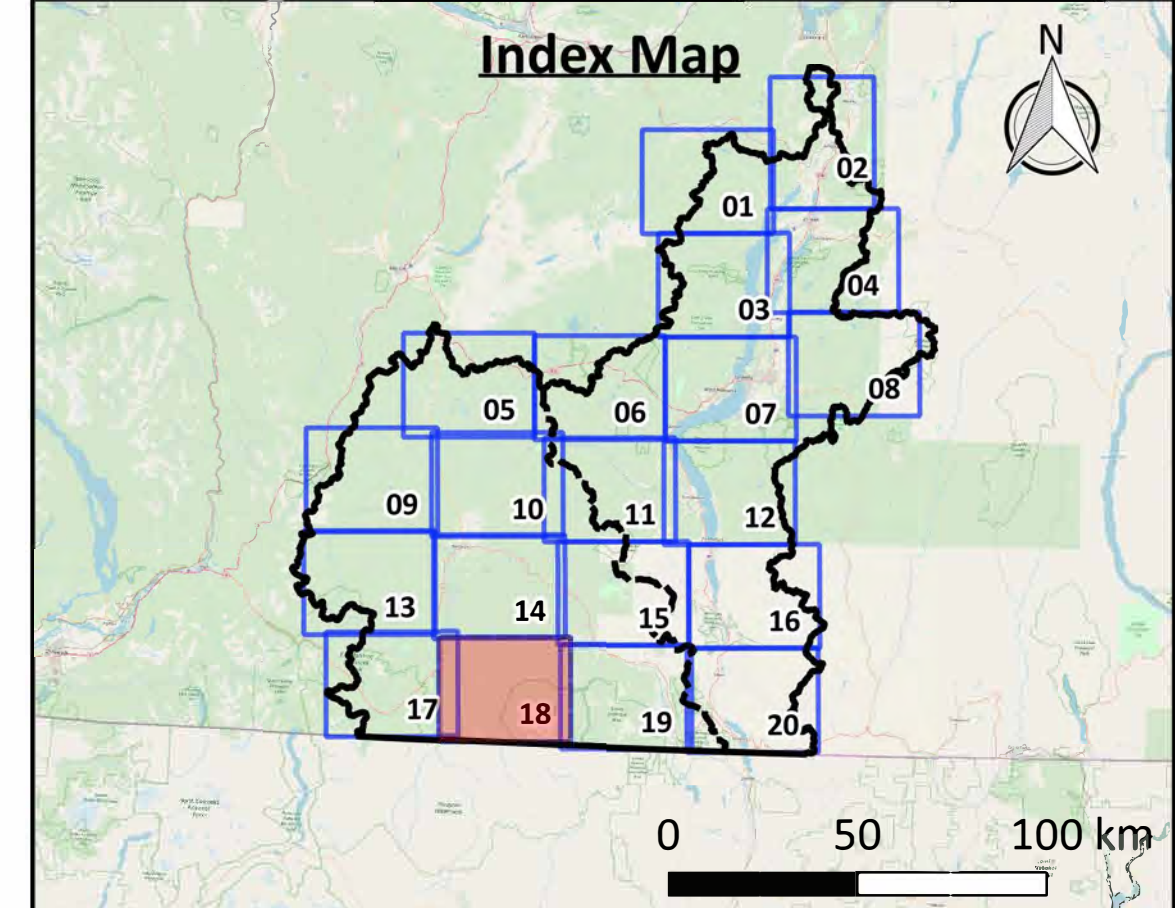
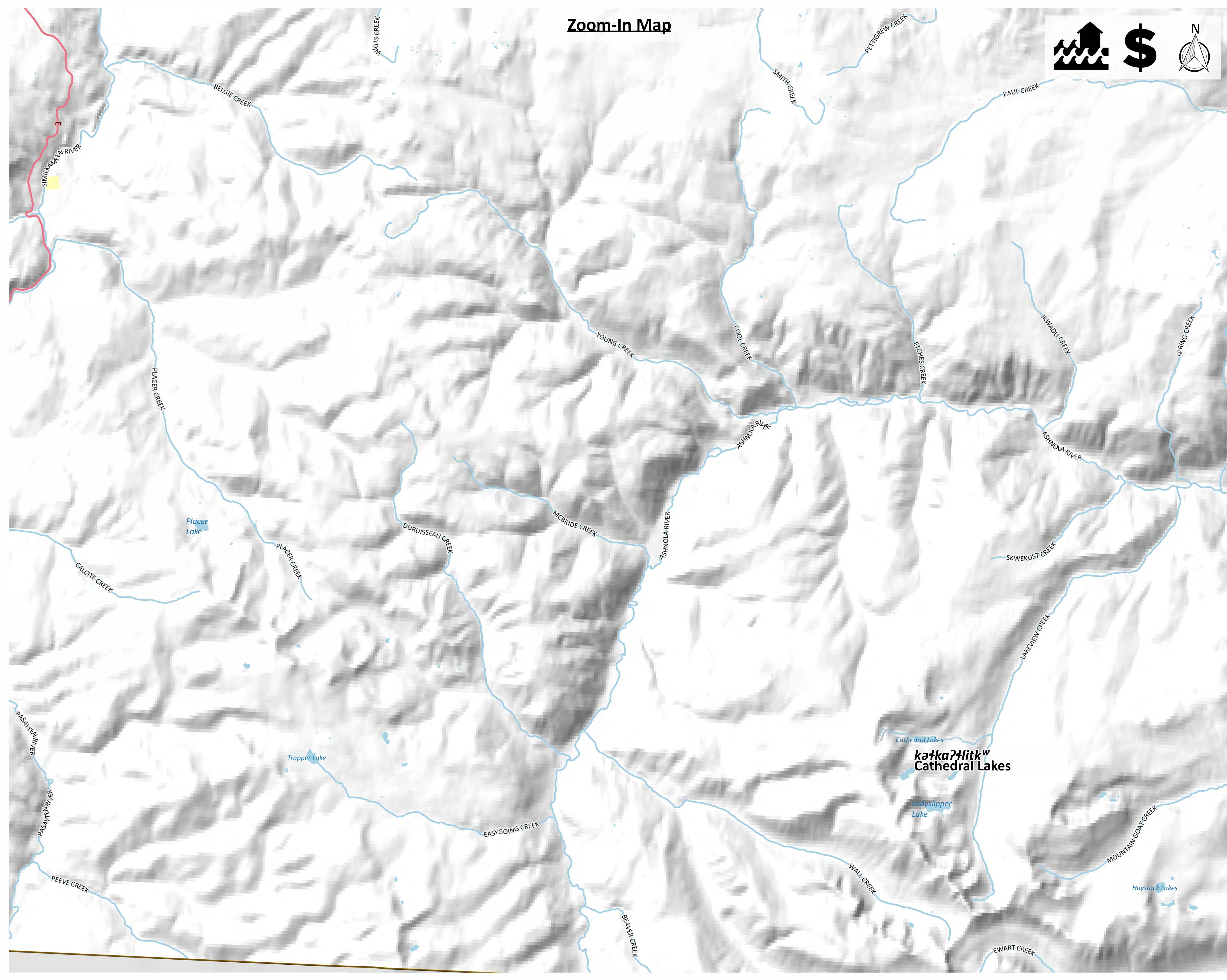
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
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ANSI D - Map No. EC-F-003-017



Zoom-In Map



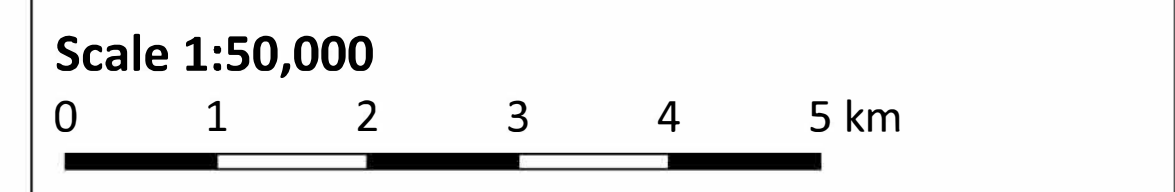
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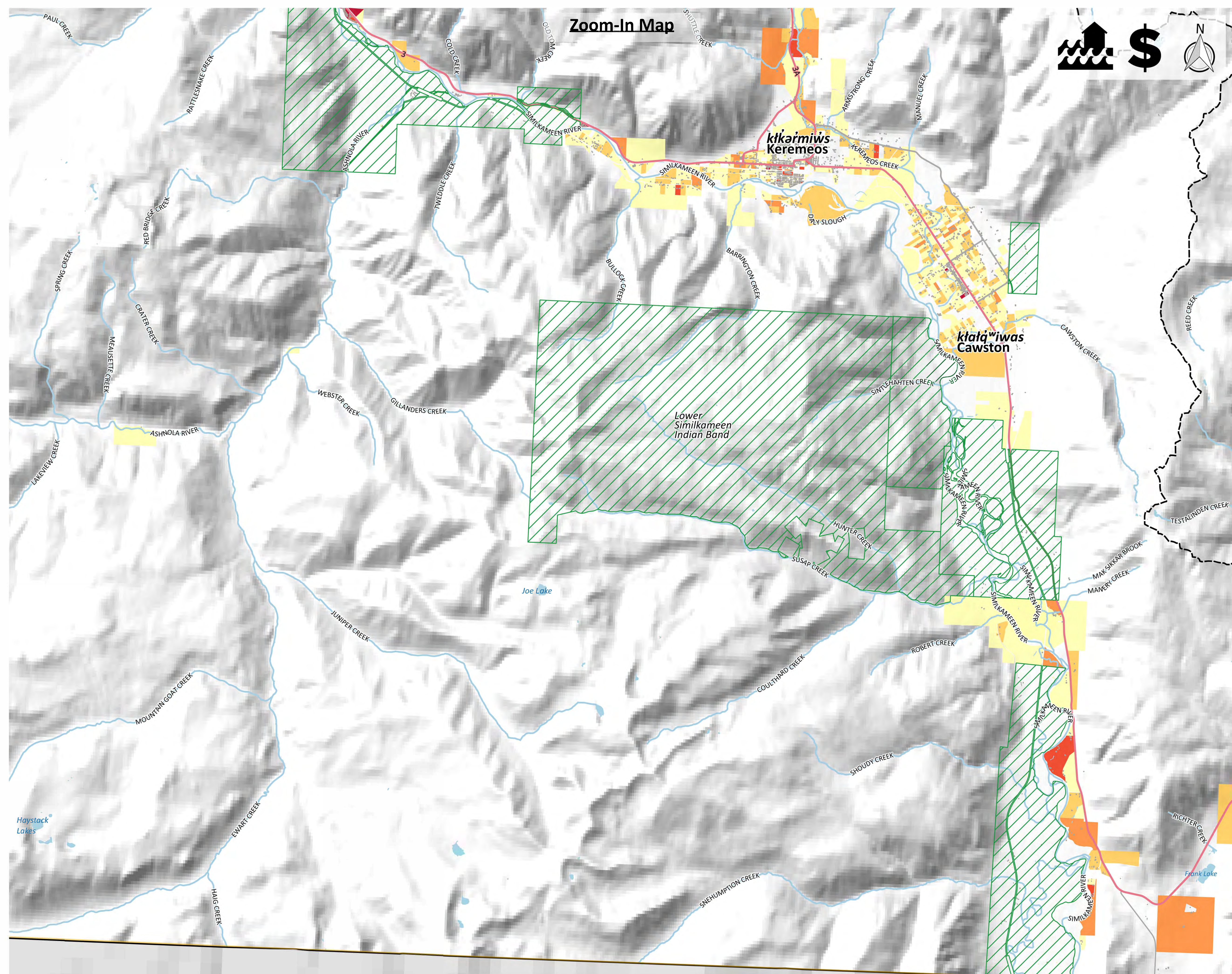
Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

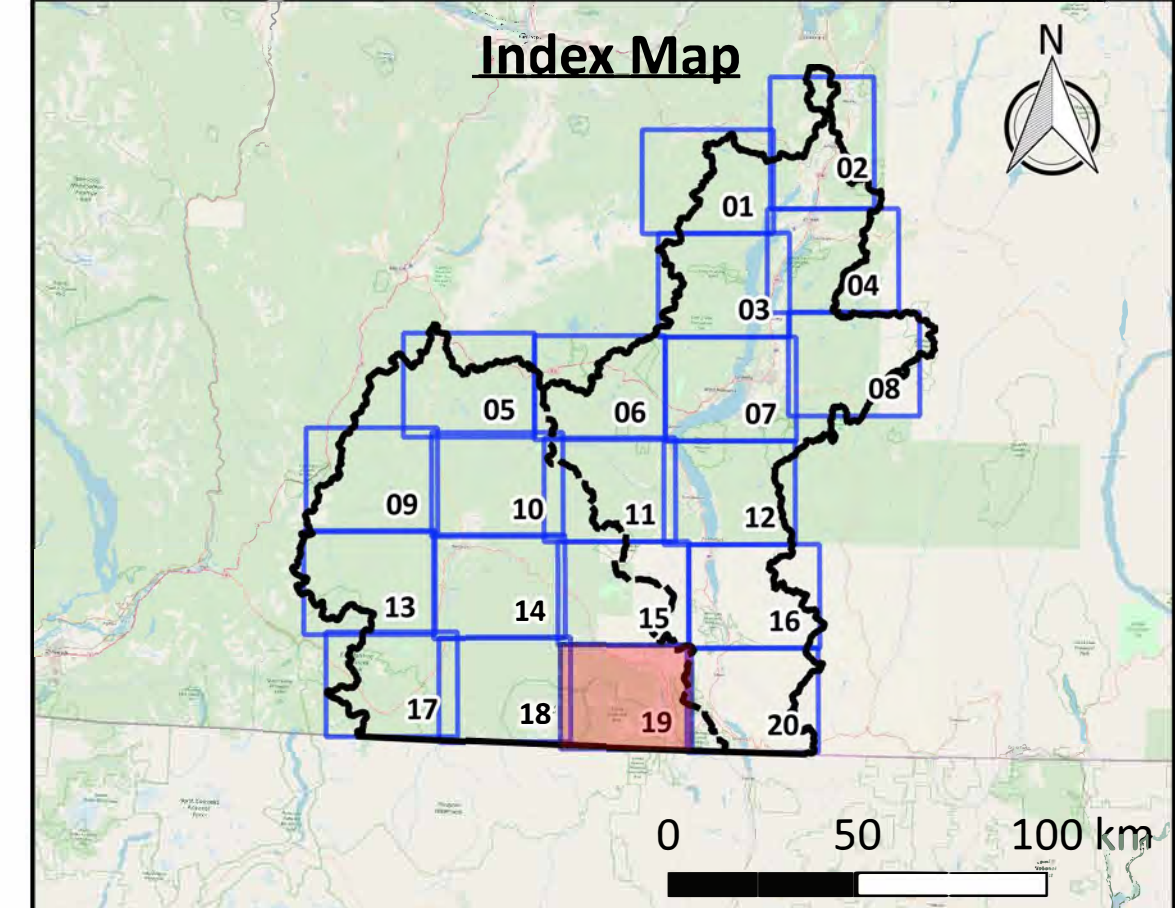
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Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
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ANSI D - Map No. EC-F-003-018



Zoom-In Map



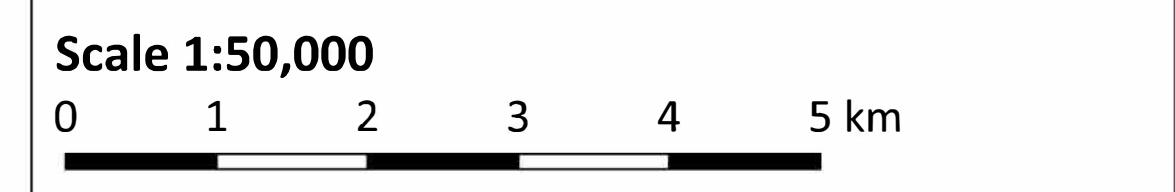
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[Click here to return to Similkameen map](#)

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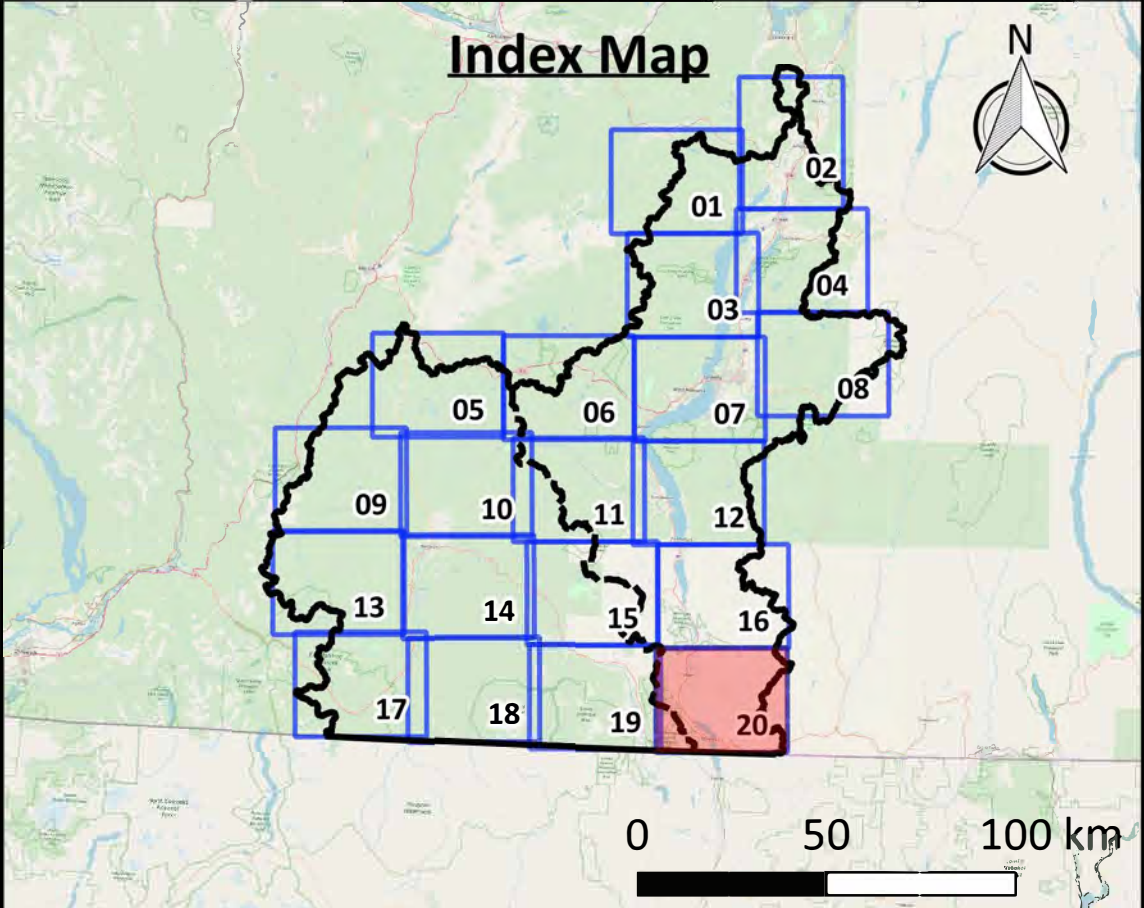
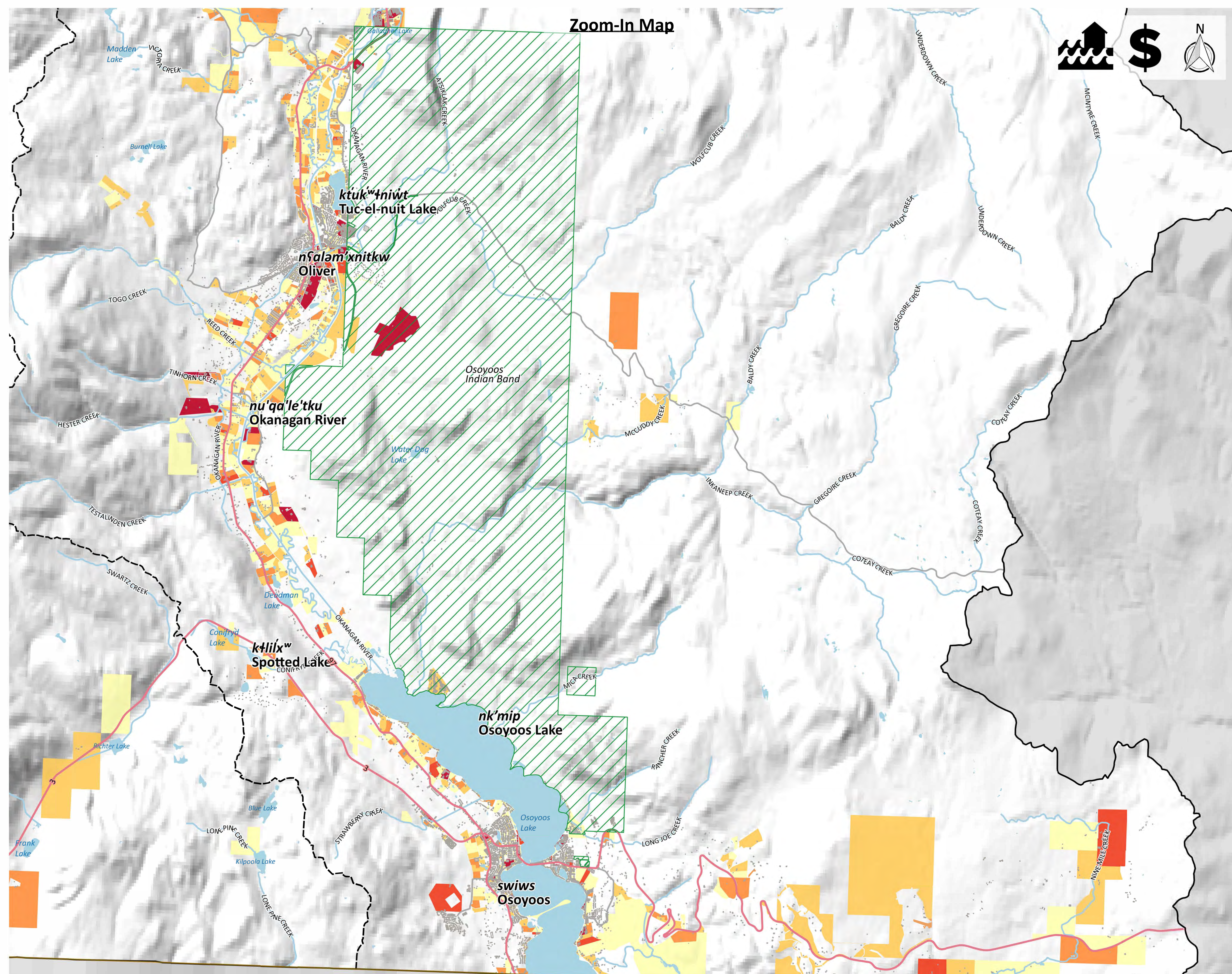


Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Property Values
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 19 of 20



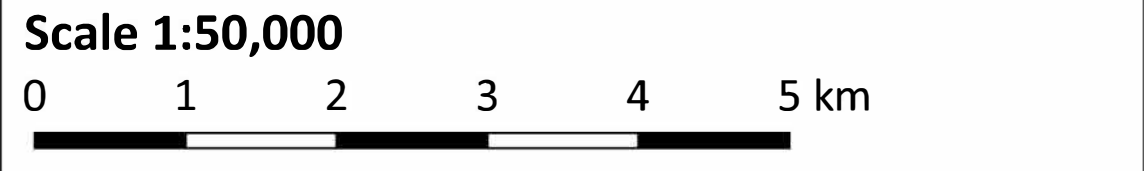
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

- Map produced by Ebbwater Consulting Inc.
- Land values are based on BC Assessment data using land parcels. The data are known to be incomplete, especially on reserve lands. The gap on reserve lands has been addressed by applying average property values to building footprints as a proxy.
- The land values (exposure) layer was clipped to the moderate flood hazard area. The hazard layer is shown in the hazard maps, and was produced by Ebbwater Consulting Inc. The method used to produce the hazard layer is described in the Quantitative Study.

Data Sources

- Lakes and Watercourses, Roads and Trails, and Reserves: BC Data Catalogue.
- Land Values: BC Assessment Data and Building Footprints.
- Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
- Sylix Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Reserves	Property Values
Lakes	\$1 - \$250,000
Watercourses	\$250,000 - \$500,000
Highway	\$500,000 - \$1,000,000
Major Road	\$1,000,000 - \$2,000,000
	\$2,000,000 +

Date: 31 December 2019
 Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Flood - Economy
Map Tile 20 of 20

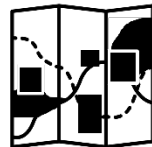
Sylix Okanagan Flood and Debris Flow Risk Assessment

Map Book

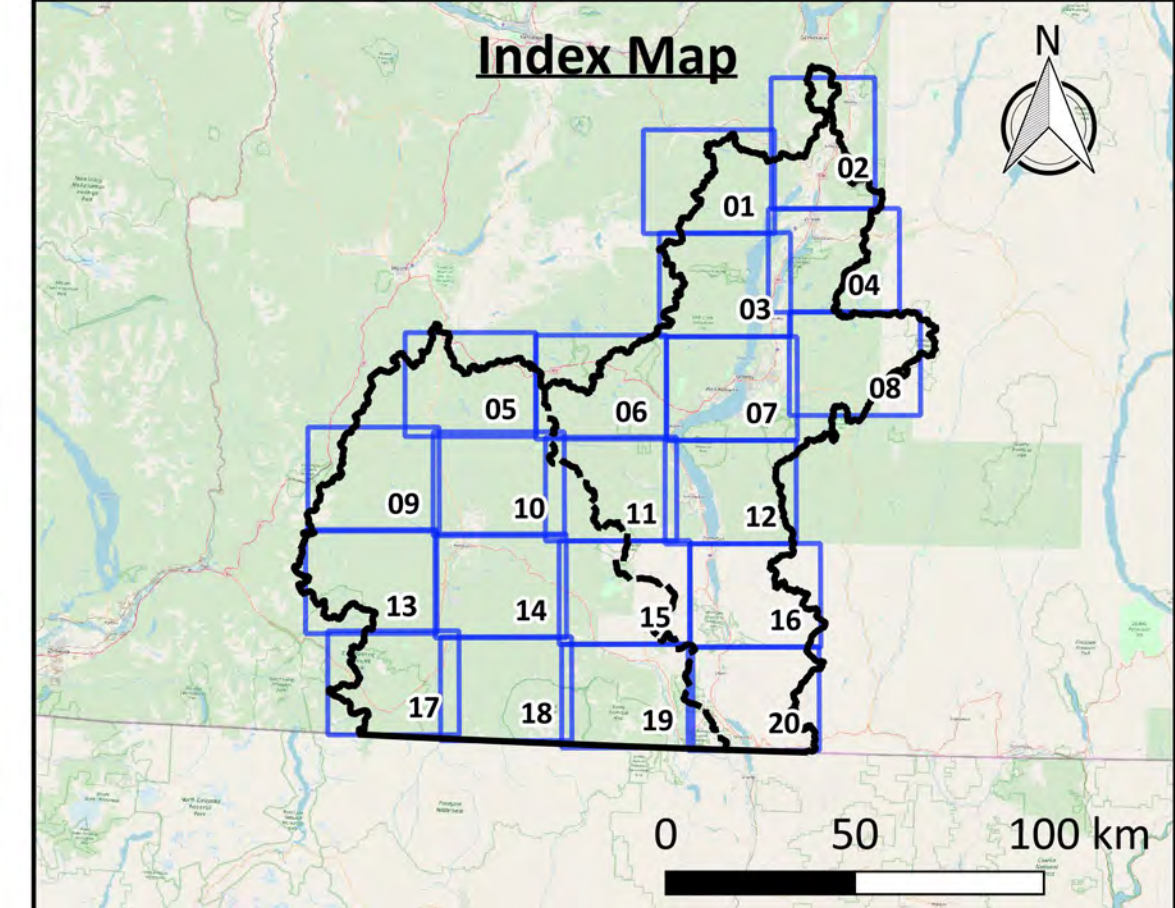
Map Series 6 of 7: Economy Indicator



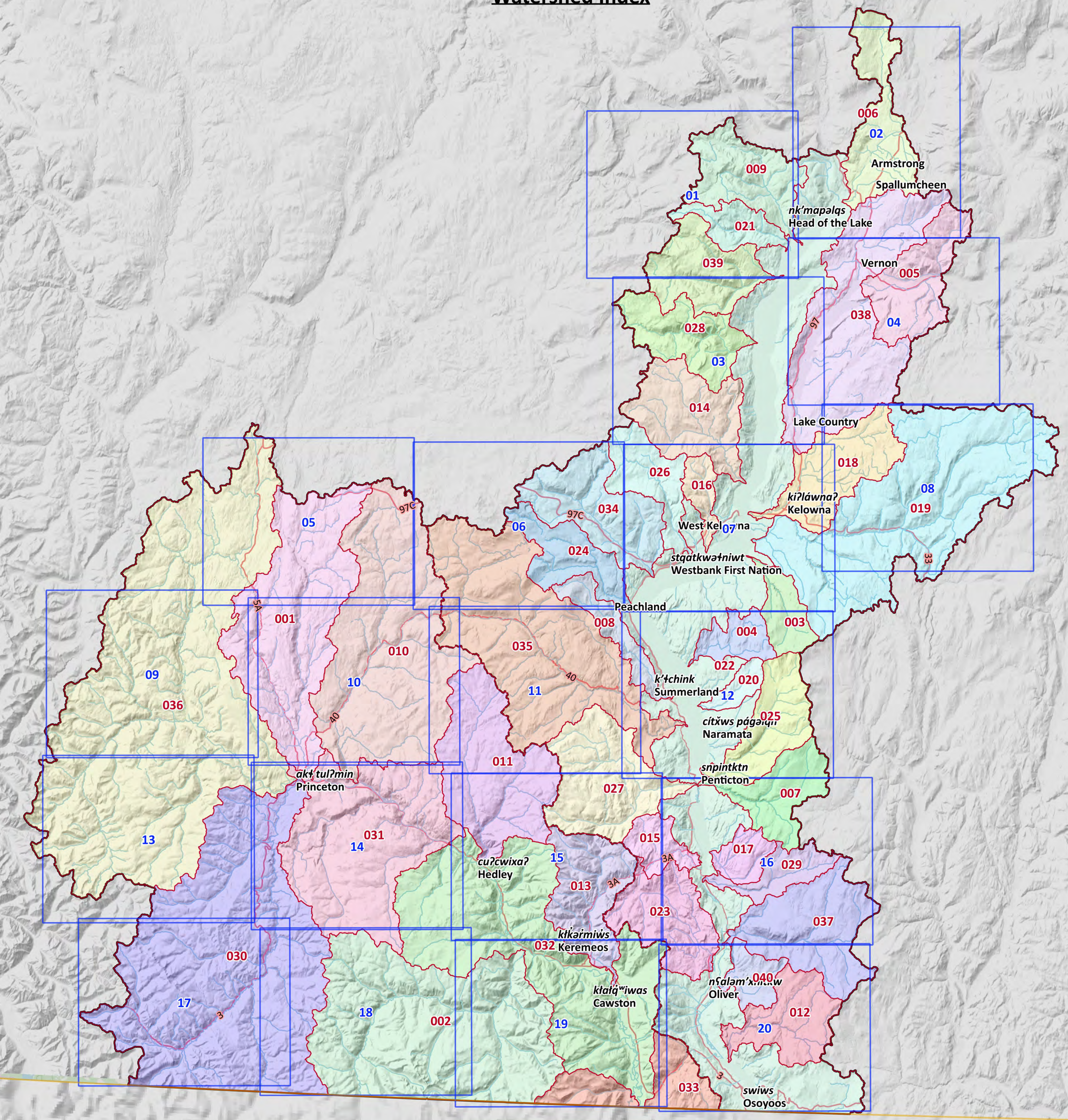
Quantitative Debris Flow Consequence Maps



Watershed Index



Click on the blue map tile to go to the Zoom-In map



Legend

- | | |
|-----------------------------------|---------------------------|
| Background | Sub-Watersheds |
| — Watershed Boundary | 001 - Allison Creek |
| --- Okanagan-Similkameen Boundary | 002 - Ashnola River |
| — Canada - US Border | 003 - Bellevue Creek |
| — Lakes | 004 - Chute Creek |
| — Watercourses | 005 - Coldstream Creek |
| — Highway | 006 - Deep Creek |
| — Major Road | 007 - Ellis Creek |
| □ Map tiles | 008 - Eneas Creek |
| | 009 - Equis Creek |
| | 010 - Hayes Creek |
| | 011 - Hedley Creek |
| | 012 - Inkaneep Creek |
| | 013 - Keremeos Creek |
| | 014 - Lambly Creek |
| | 015 - Marron River |
| | 016 - McDougall Creek |
| | 017 - McLean Creek |
| | 018 - Mill Creek |
| | 019 - Mission Creek |
| | 020 - Naramata Creek |
| | 021 - Naswhito Creek |
| | 022 - Okanagan River |
| | 023 - Park Rill |
| | 024 - Peachland Creek |
| | 025 - Penticton Creek |
| | 026 - Powers Creek |
| | 027 - Shingle Creek |
| | 028 - Shorts Creek |
| | 029 - Shuttleworth Creek |
| | 030 - Similkameen River 1 |
| | 031 - Similkameen River 2 |
| | 032 - Similkameen River 3 |
| | 033 - Similkameen River 4 |
| | 034 - Trepanier Creek |
| | 035 - Trout Creek |
| | 036 - Tulameen River |
| | 037 - Vaseux Creek |
| | 038 - Vernon Creek |
| | 039 - Whiteman Creek |
| | 040 - Wolfcub Creek |

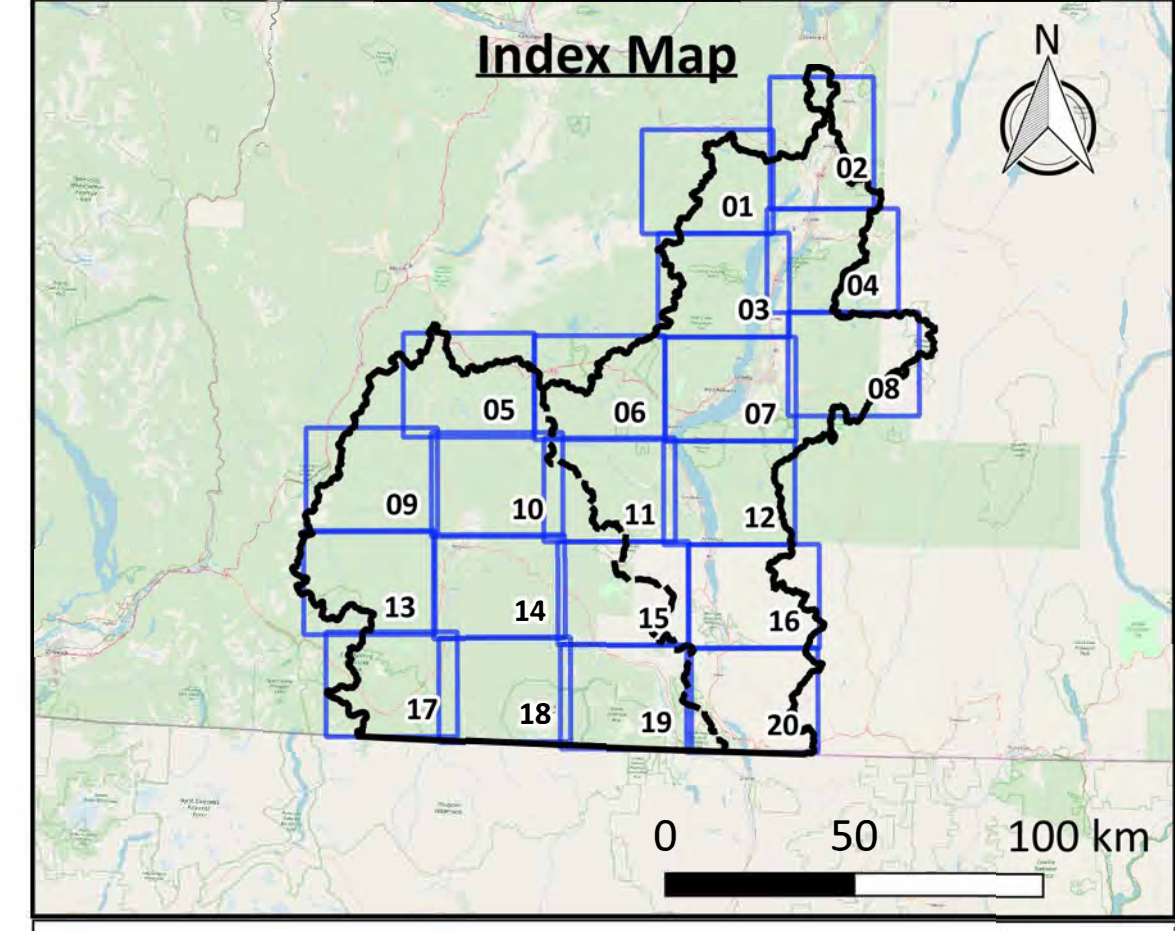
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Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

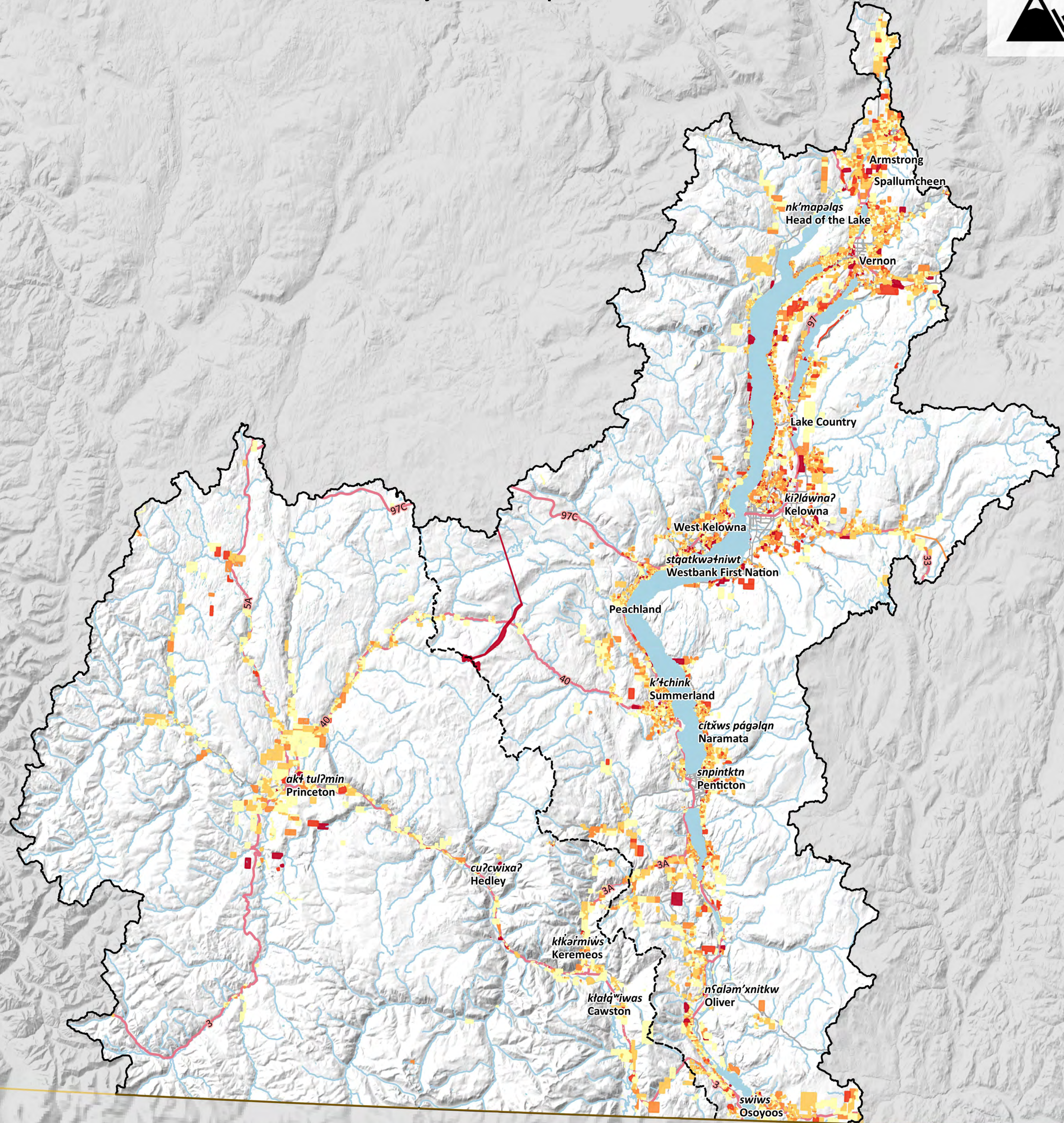
Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy

ANSI D - Map No. EC-D-001-001

Project Area Map



Click above map tile for Zoom-In map
[Click here to go to Okanagan Map](#)
[Click here to go to Similkameen Map](#)



Map Notes

- Map produced by Ebbwater Consulting Inc.
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- The land values (exposure) layer was clipped to the debris flow hazard area. The hazard layer is shown in the hazard maps, and was produced by Palmer Environmental Consulting Group Inc. The method used to produce the hazard layer is described in the Quantitative Study.

Data Sources

- Lakes, Watercourses, Roads, and Trails: BC Data Catalogue.
- Land Values: BC Assessment Data and Building Footprints.
- Sylix Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.

Scale 1:350,000
 0 10 20 30 km

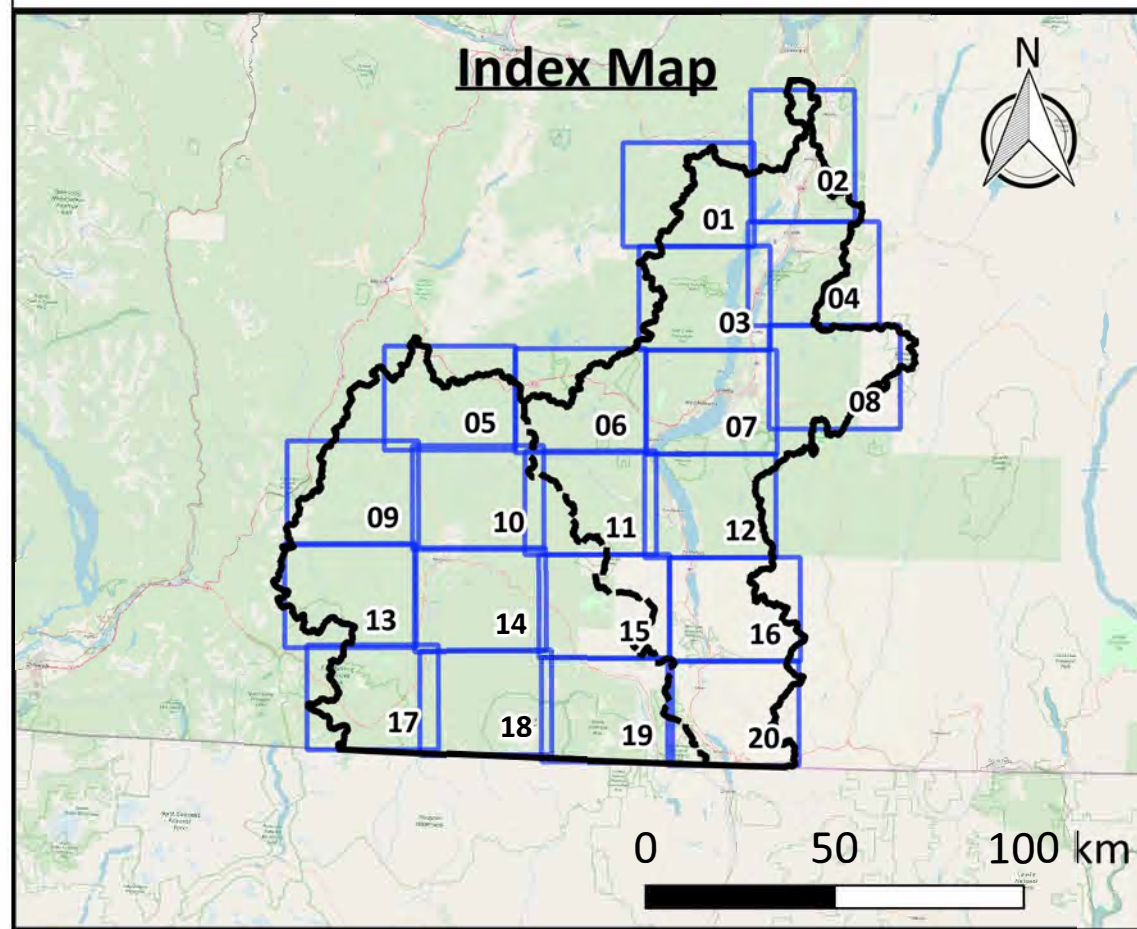
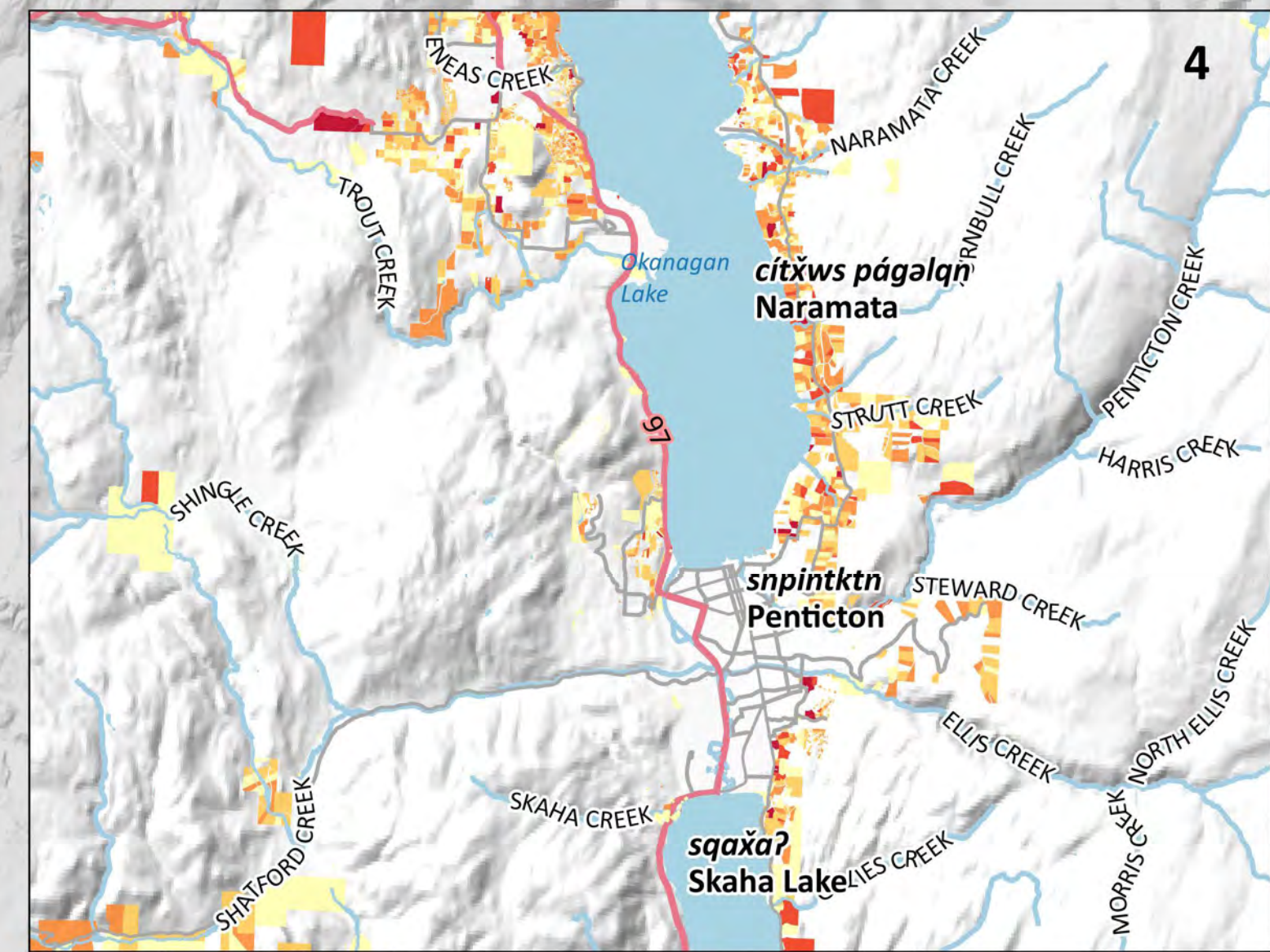
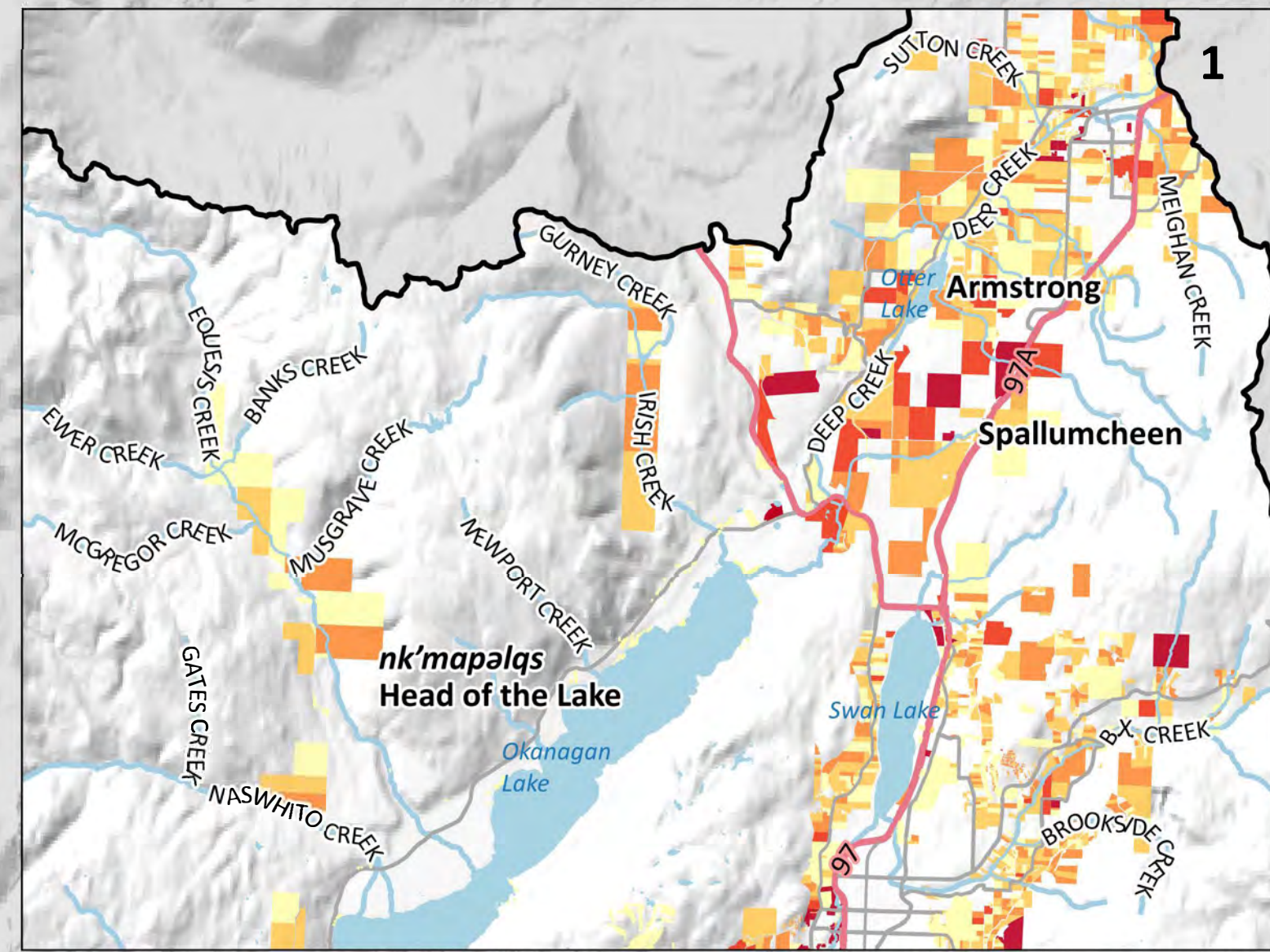
Legend

Watershed Boundary	Total Land Value \$1 - \$250,000
Okanagan-Similkameen	\$250,000 - \$500,000
Boundary	\$500,000 - \$1,000,000
Canada - US Border	\$1,000,000 - \$2,000,000
Lakes	\$2,000,000 +
Watercourses	
Highway	
Major Road	

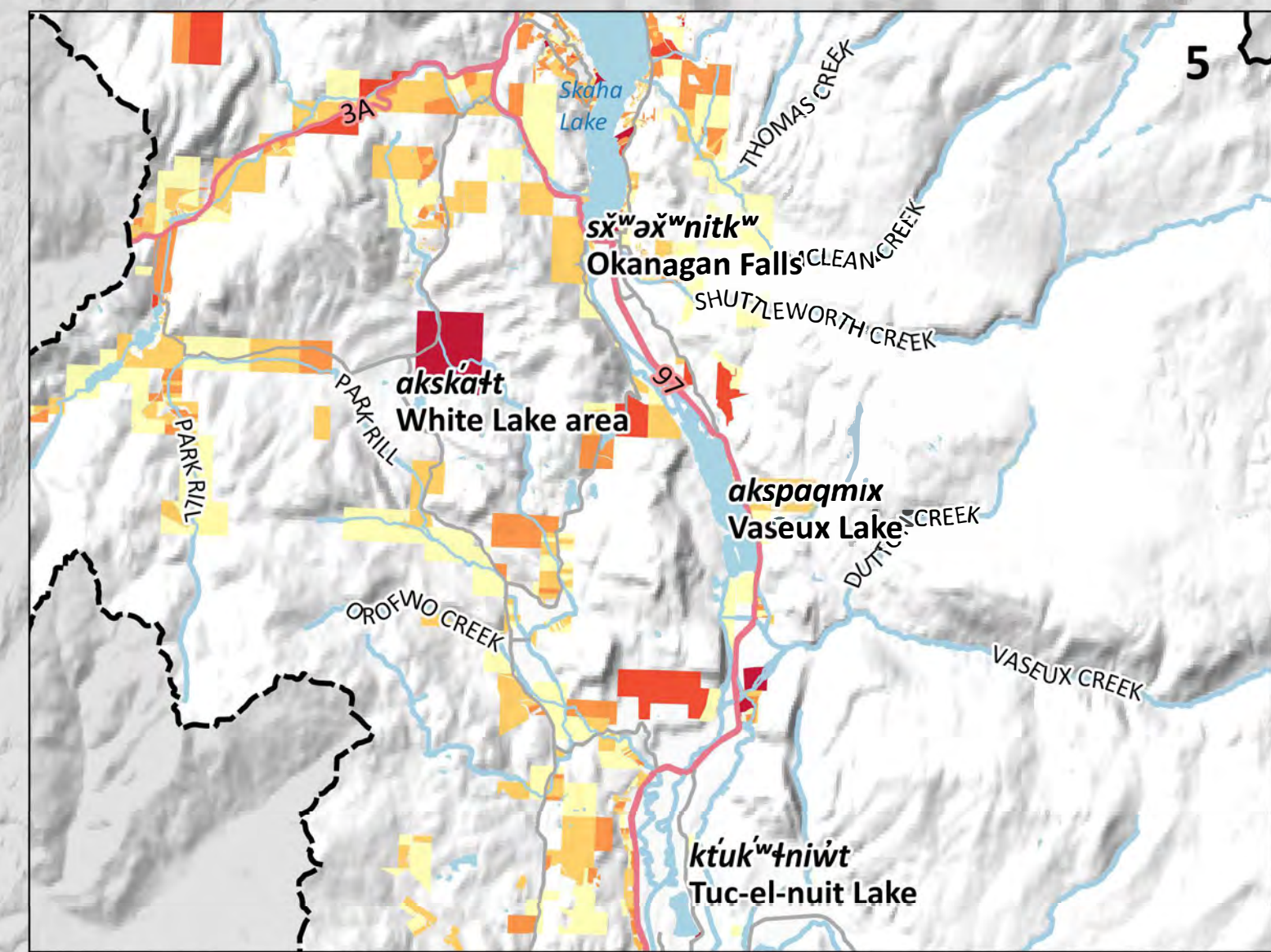
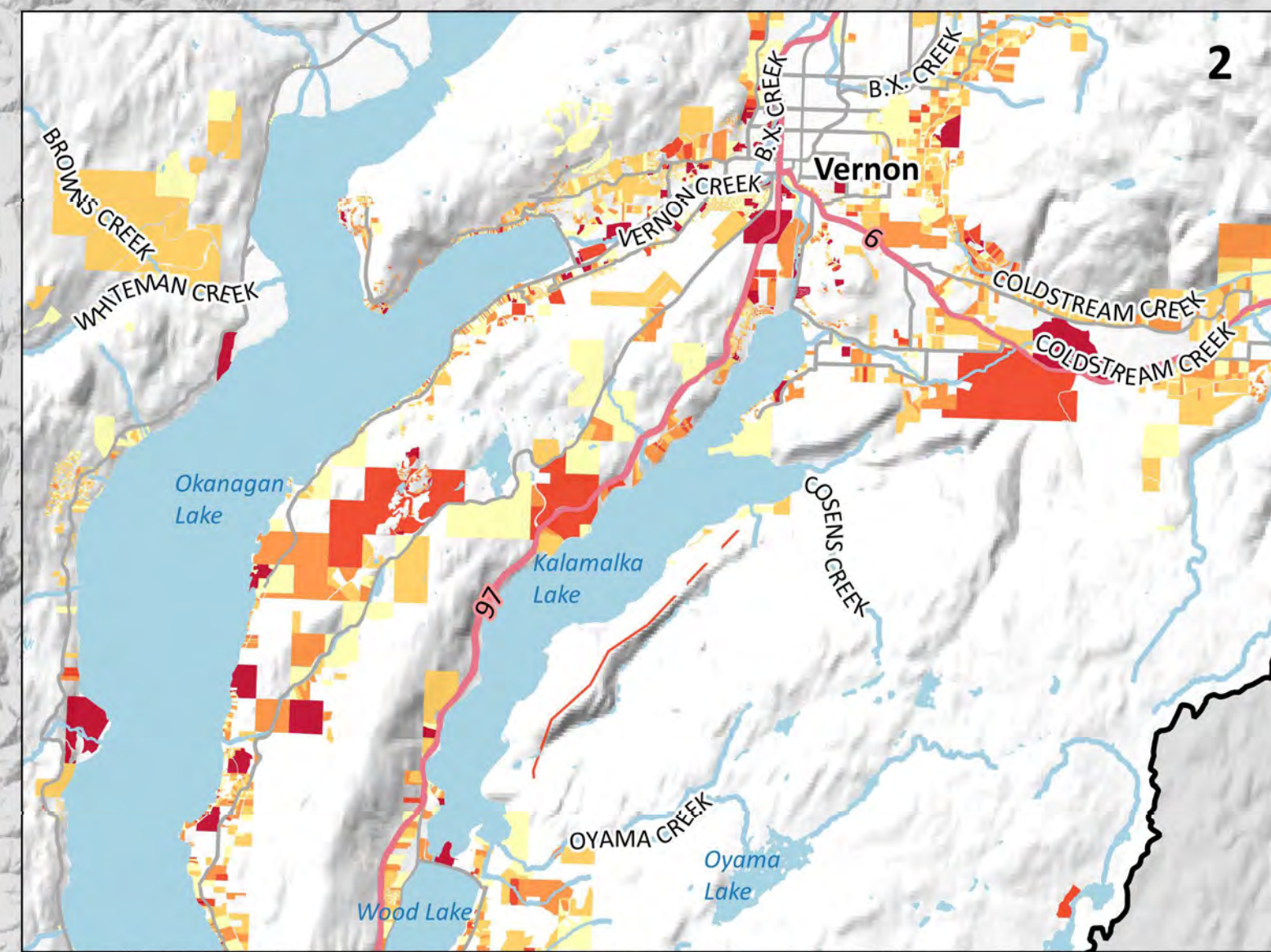
Date: 31 December 2019
 Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy

Okanagan Map



Click above map tile for Zoom-In map
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[Click here to go to Similkameen map](#)



Map Notes

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Scale
Main Map 1:400,000
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Inset Maps 1:150,000
 0 5 10 15 km

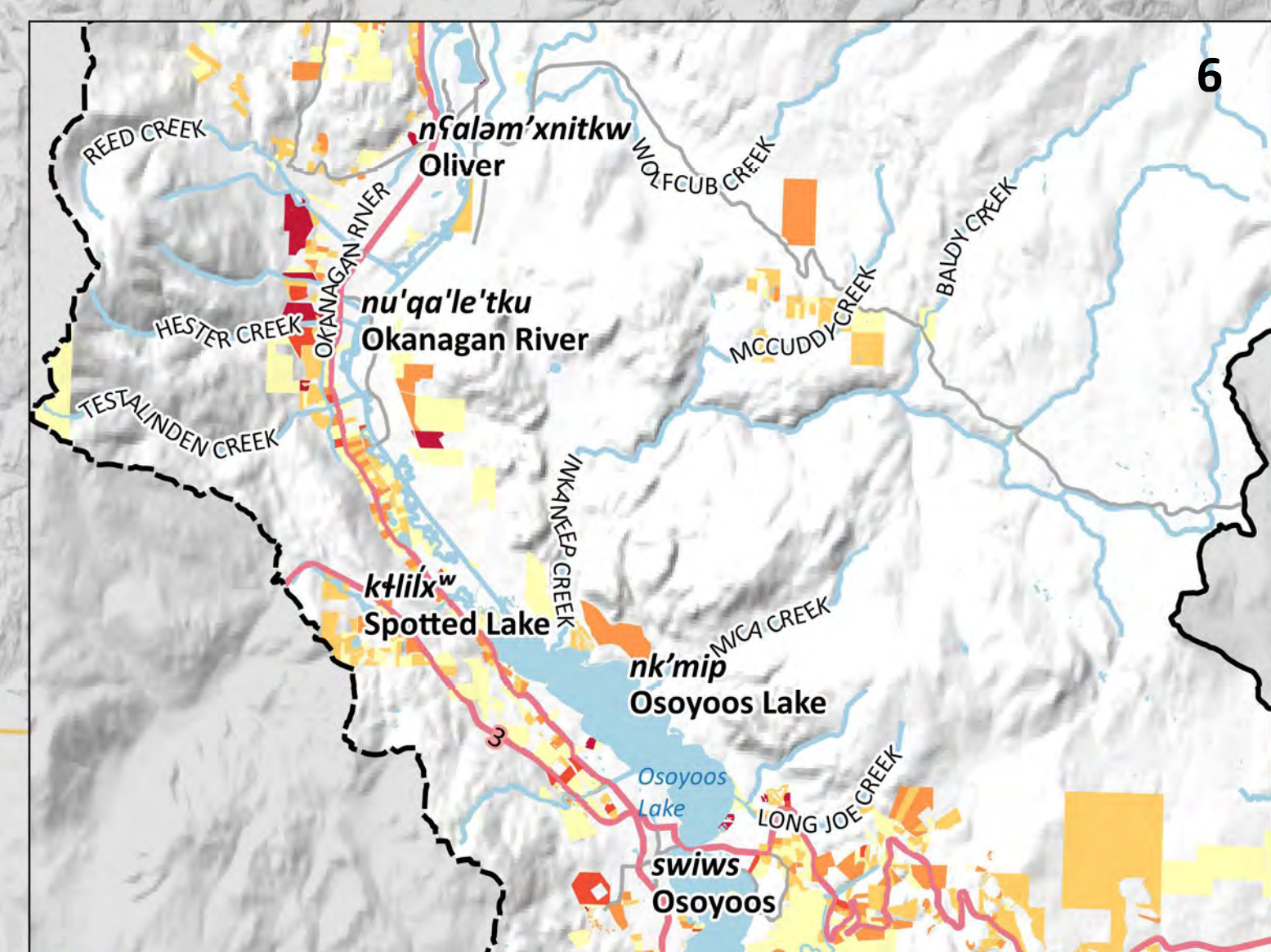
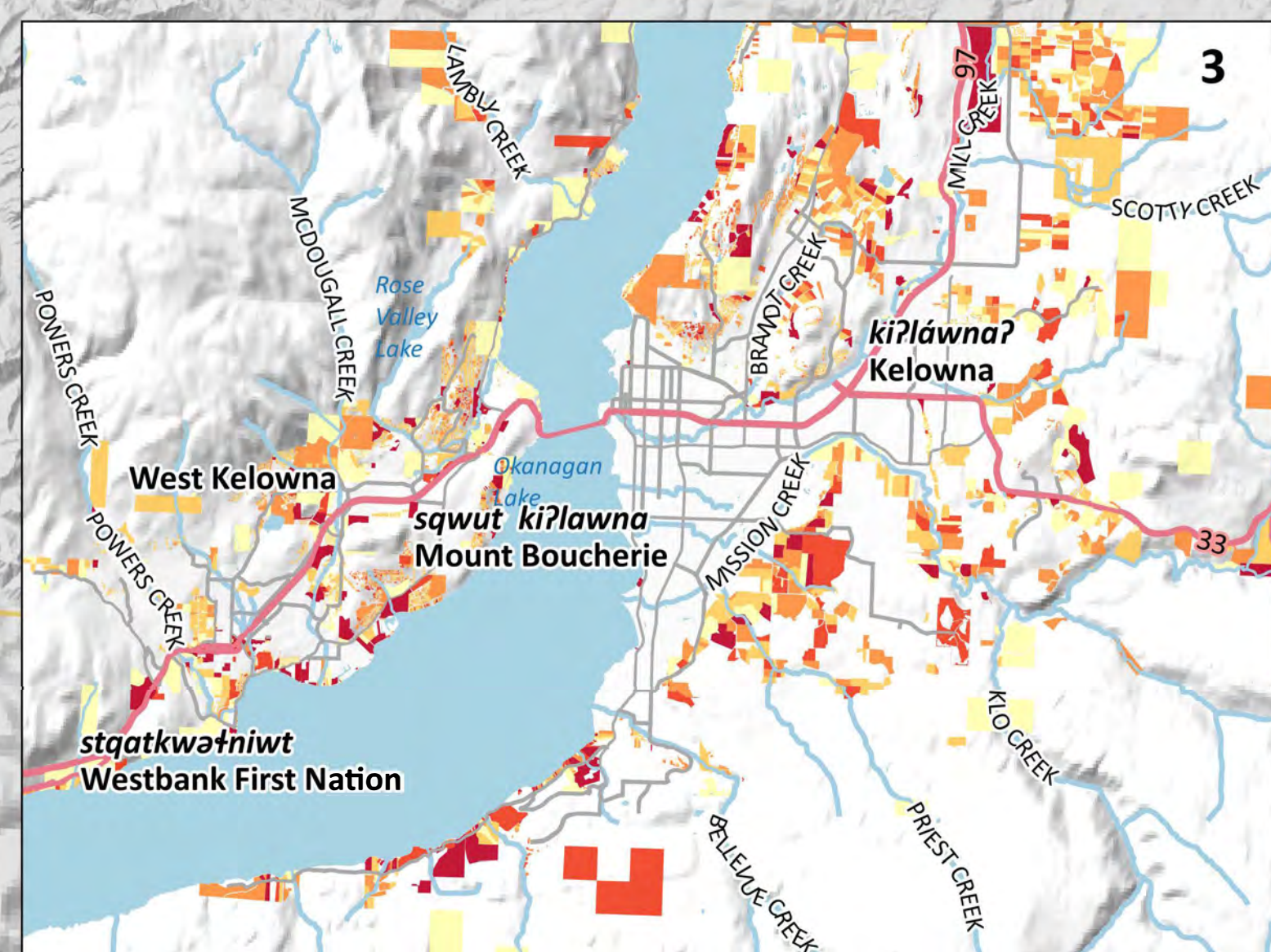
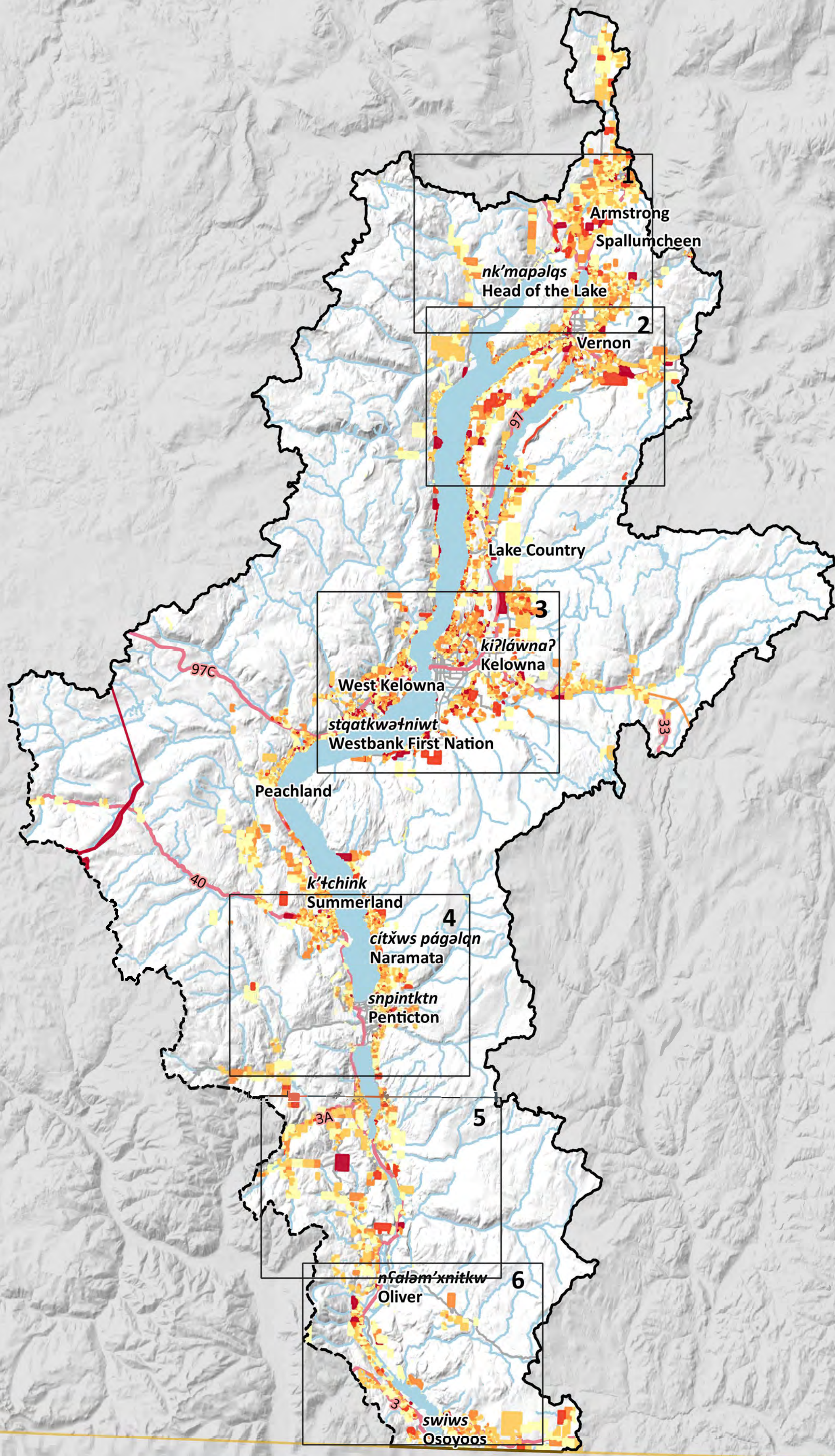
Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Boundary	Total Land Value
Canada - US Border	\$1 - \$250,000
Watercourses	\$250,000 - \$500,000
Highway	\$500,000 - \$1,000,000
Major Road	\$1,000,000 - \$2,000,000
	\$2,000,000 +

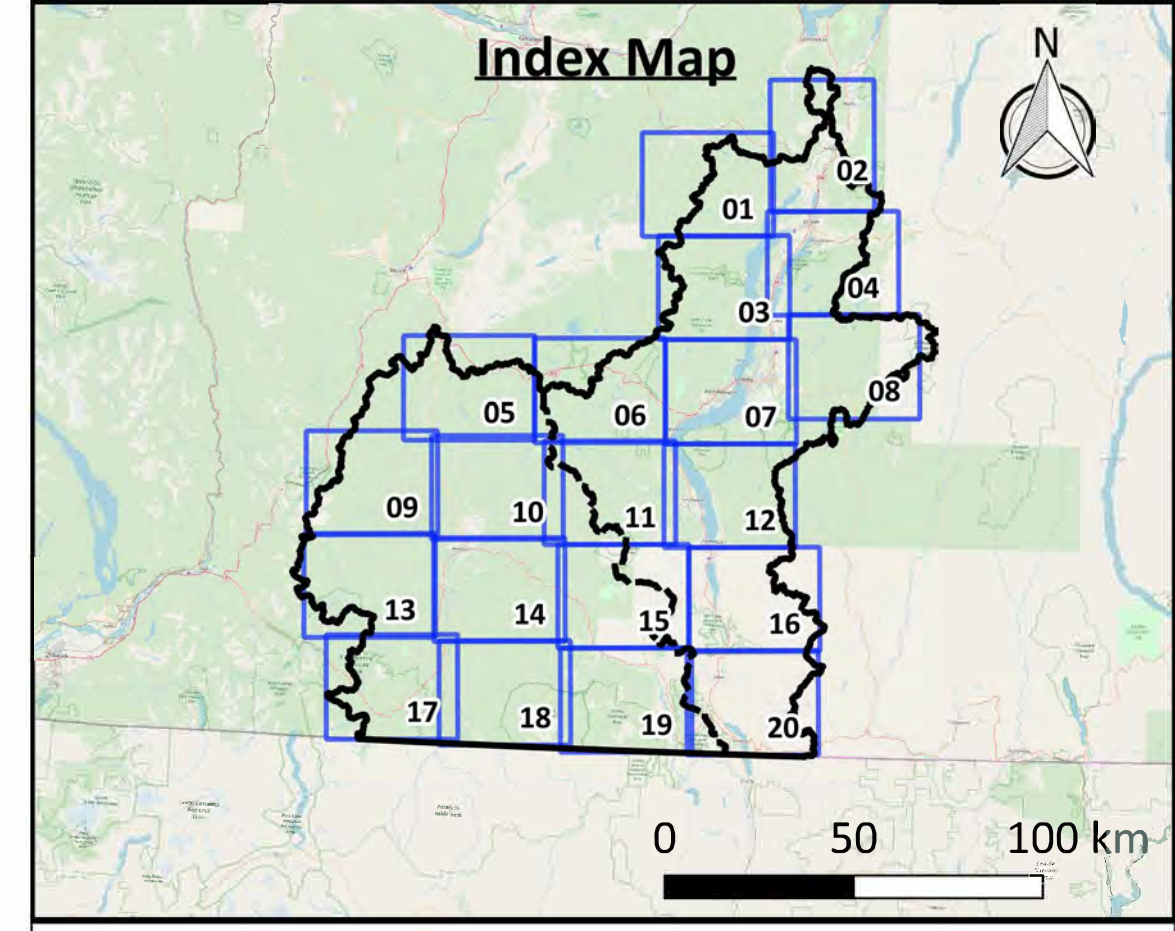
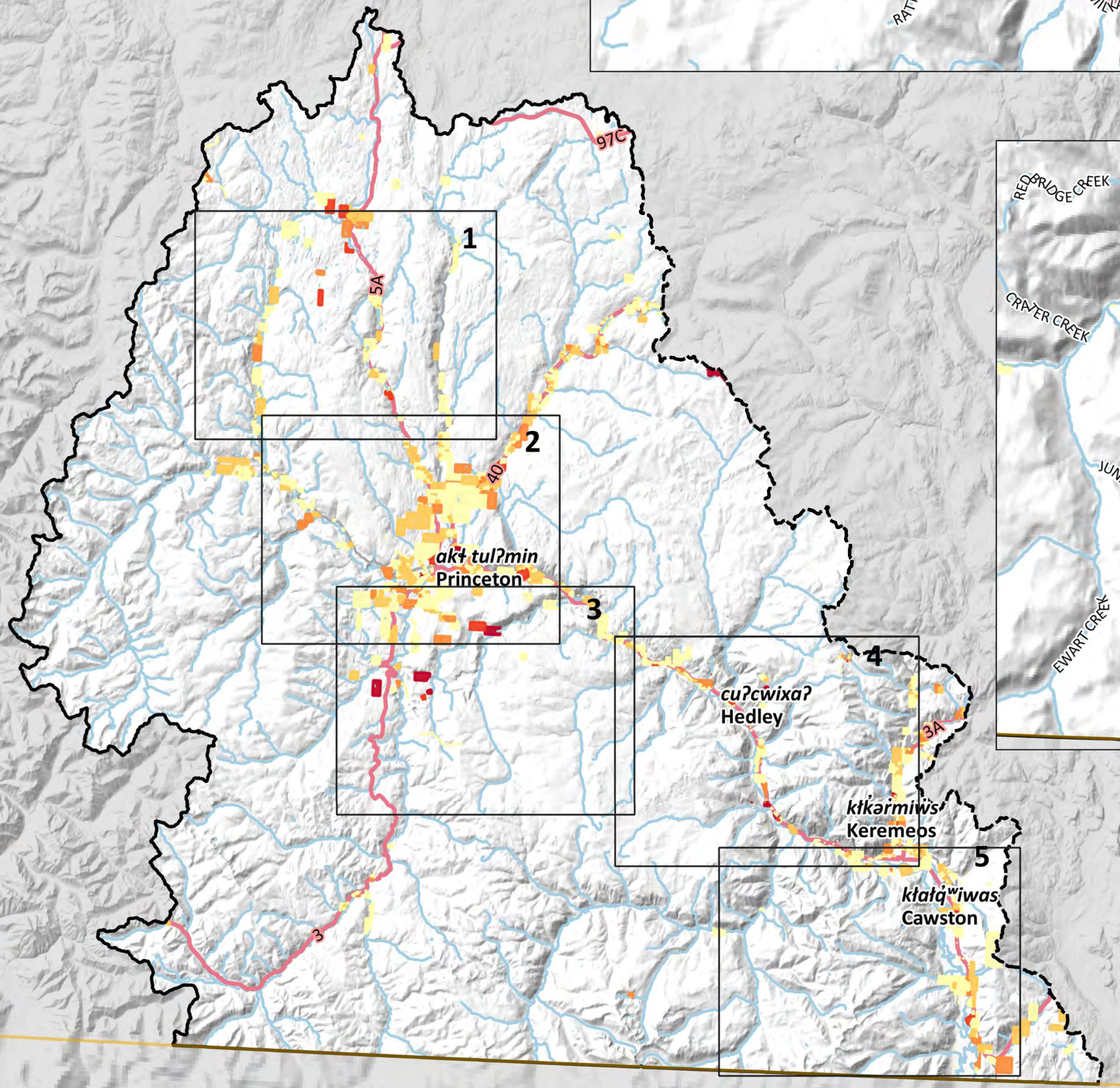
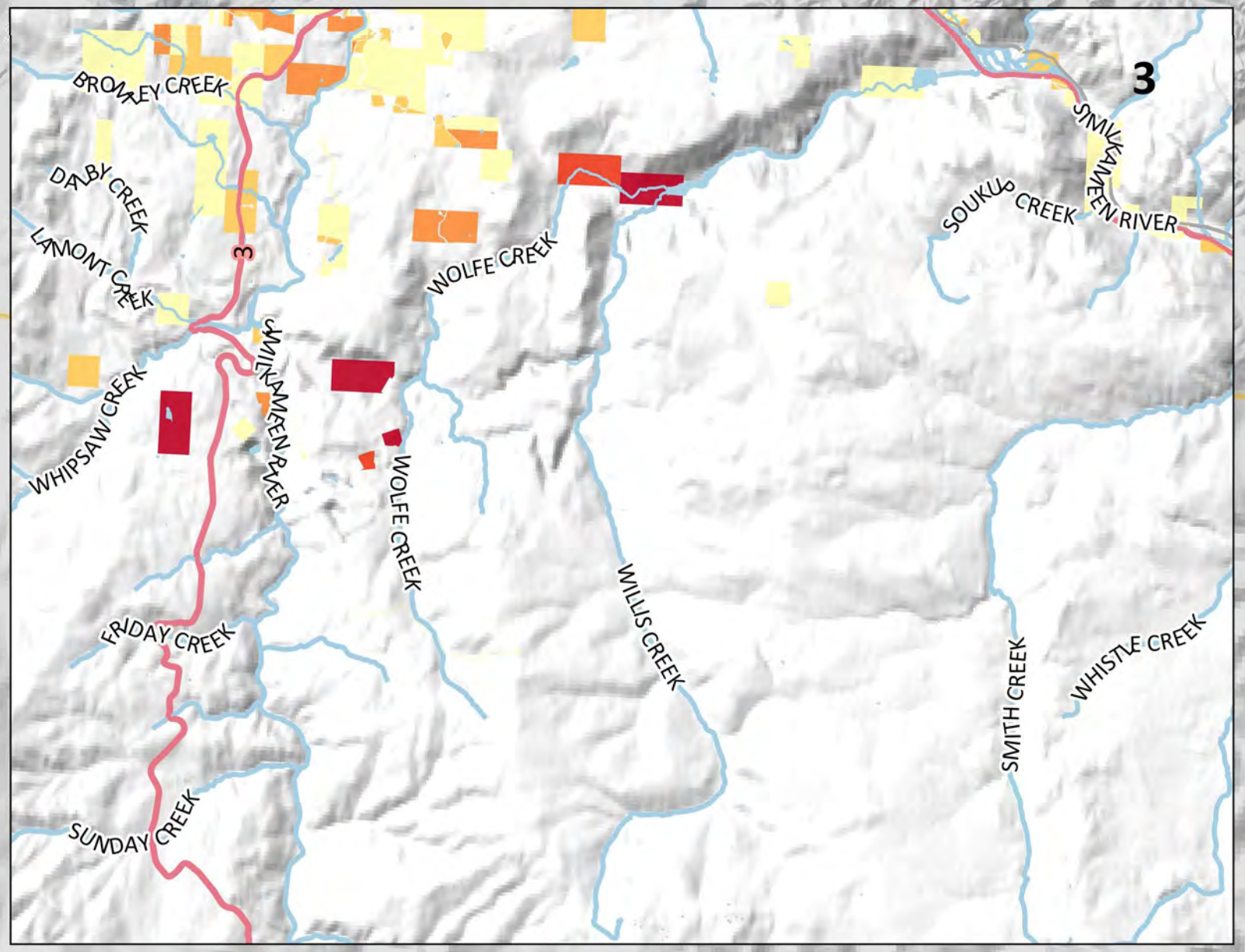
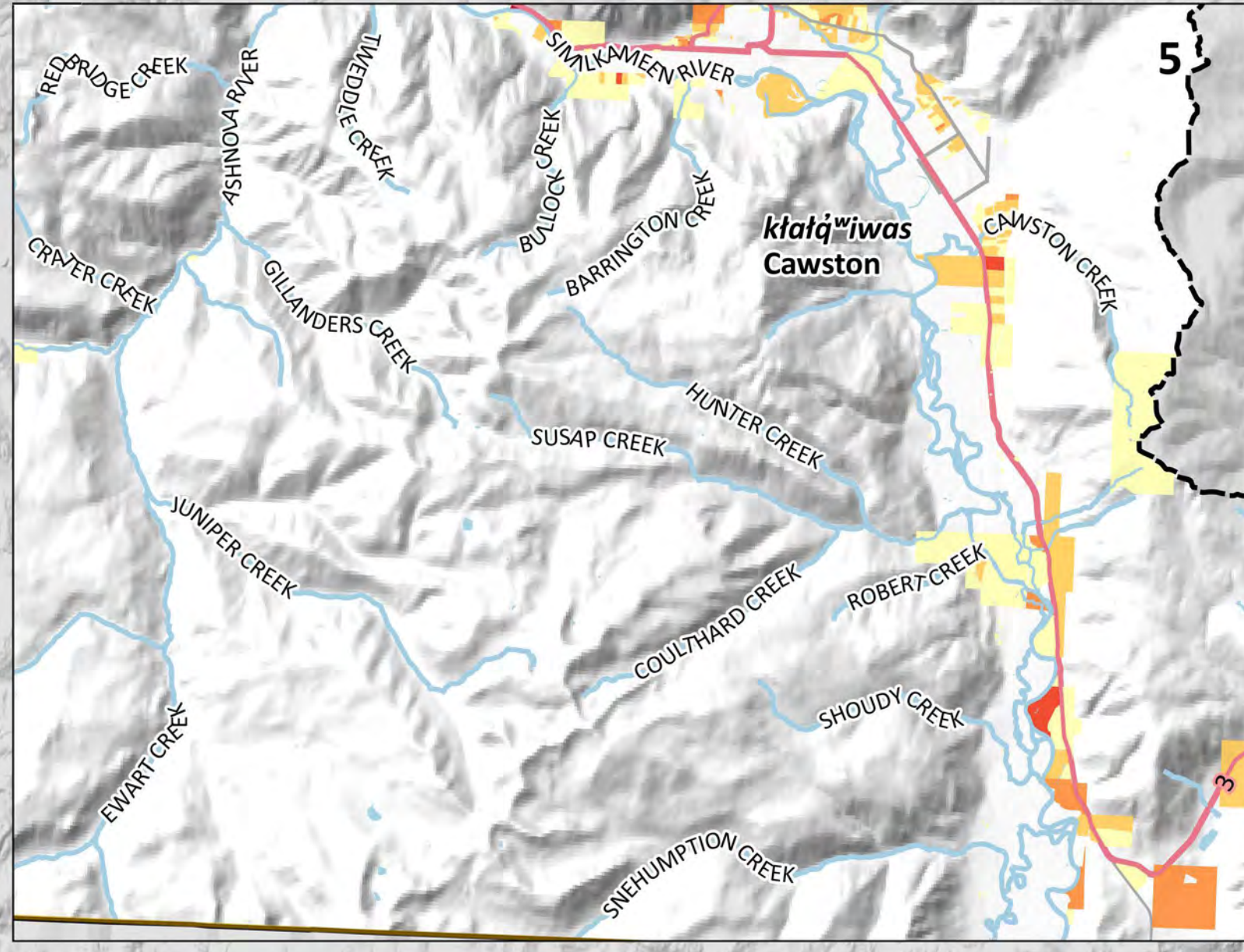
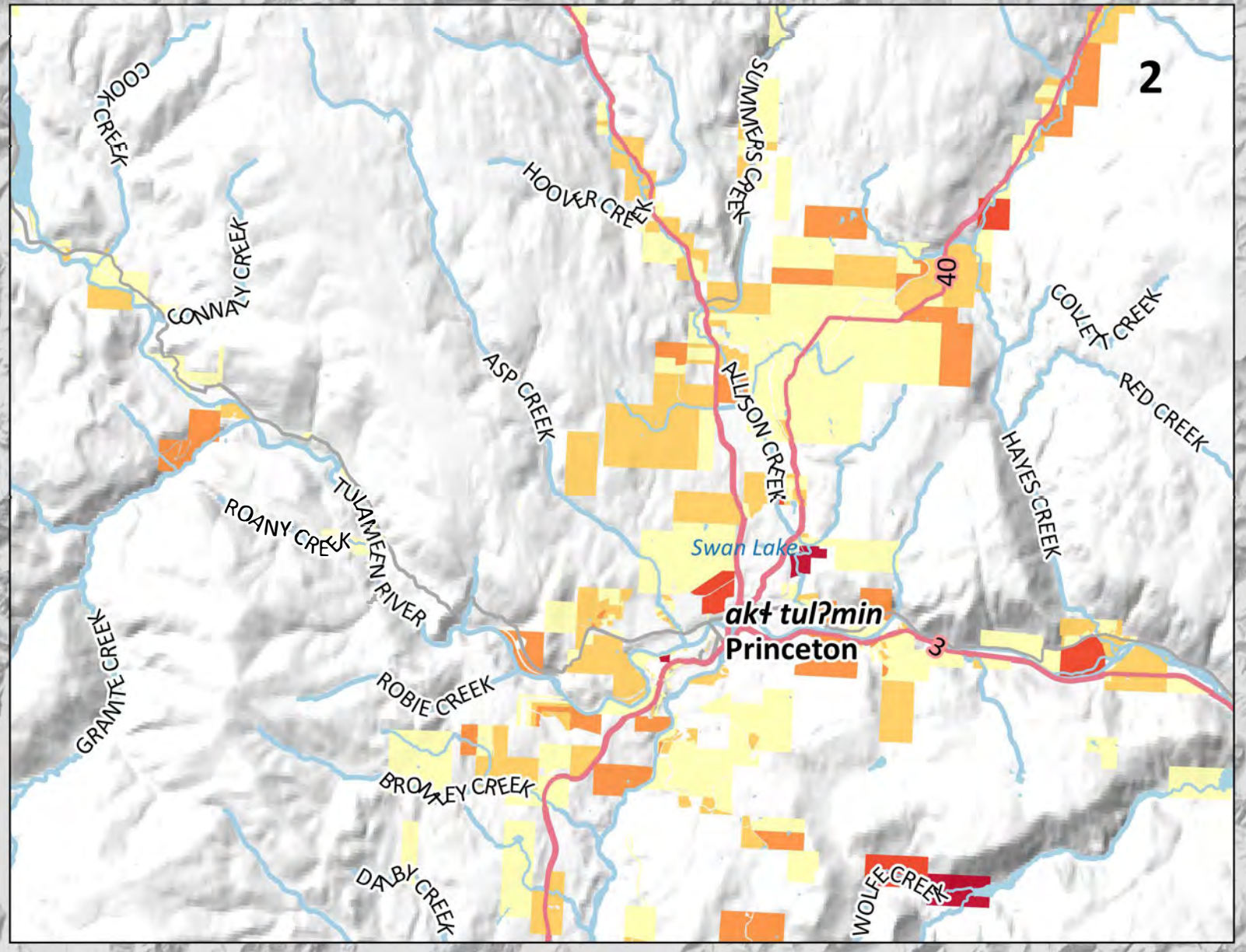
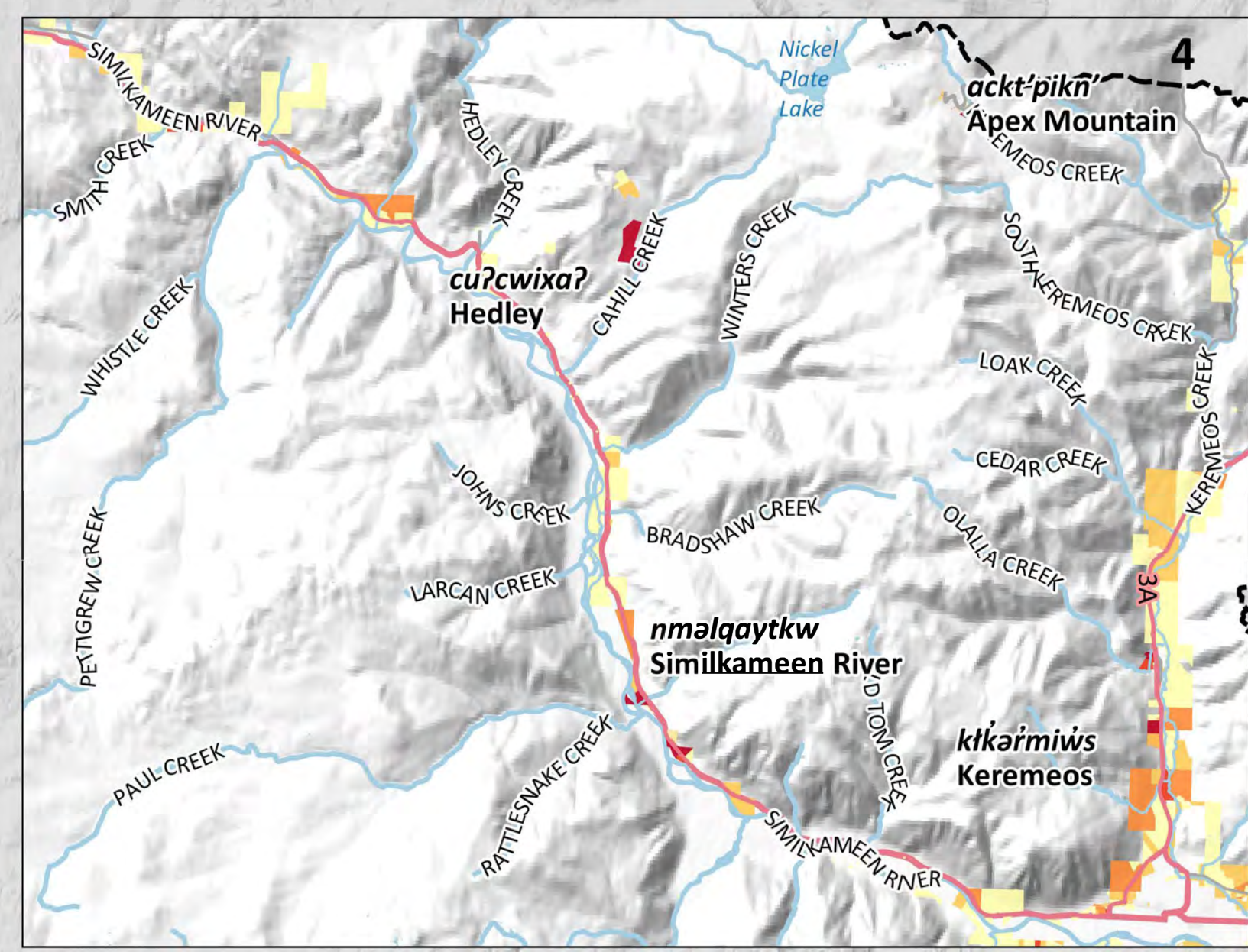
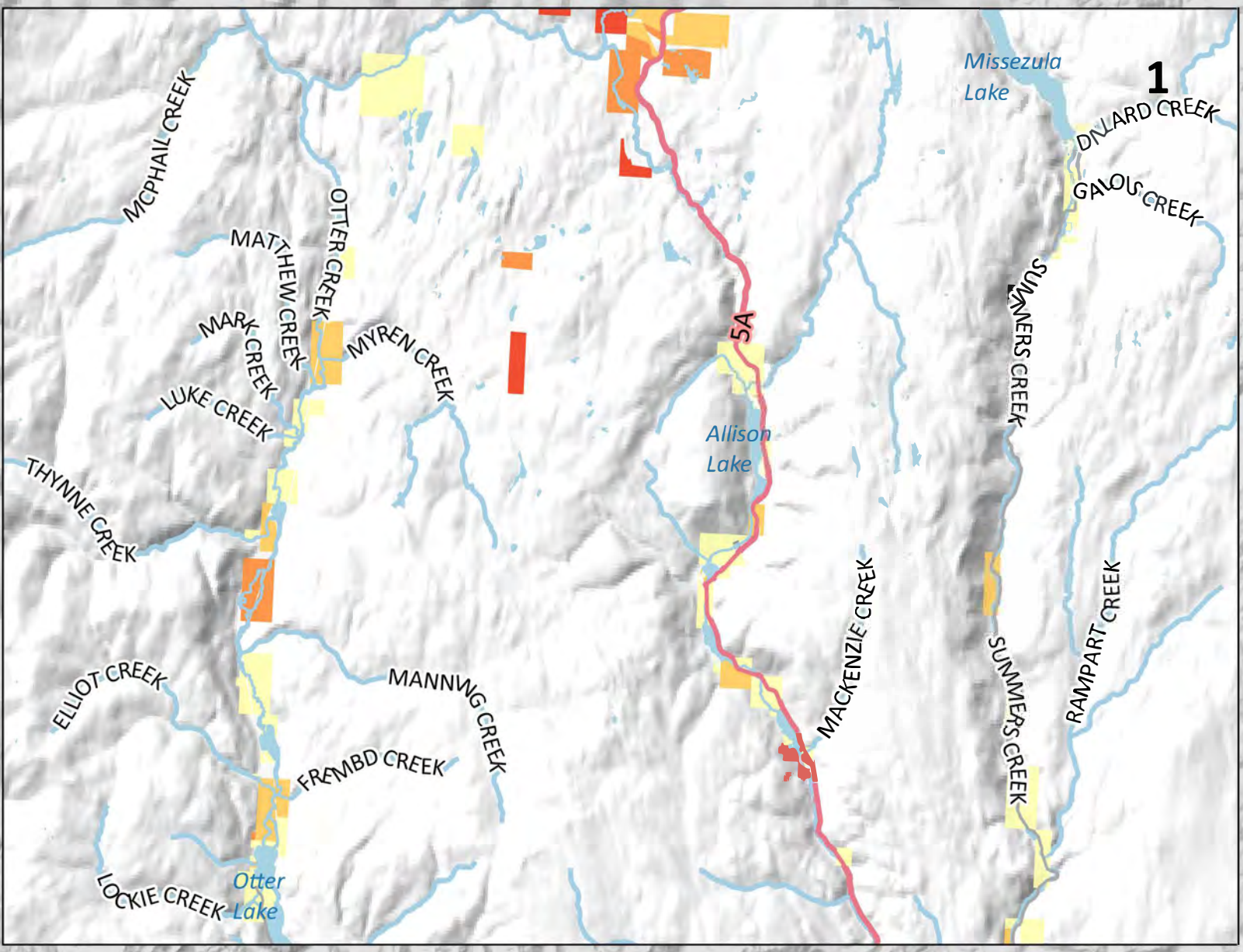
Date: 31 December 2019
 Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy - Okanagan

ANSI D - Map No. EC-D-002-002



Similkameen Map



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Map Notes

- Map produced by Ebbwater Consulting Inc.
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- The land values (exposure) layer was clipped to the debris flow hazard area. The hazard layer is shown in the hazard maps, and was produced by Palmer Environmental Consulting Group Inc. The method used to produce the hazard layer is described in the Quantitative Study.

Data Sources

- Lakes and Watercourses, Roads and Trails, and Reserves: BC Data Catalogue.
- Land Values: BC Assessment Data and Building Footprints.
- Sylx Place Names: Okanagan Nation Alliance.
- Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.

Scale
Main Map 1:400,000
 0 10 20 30 km

Inset Maps 1:150,000
 0 5 10 15 km

Legend

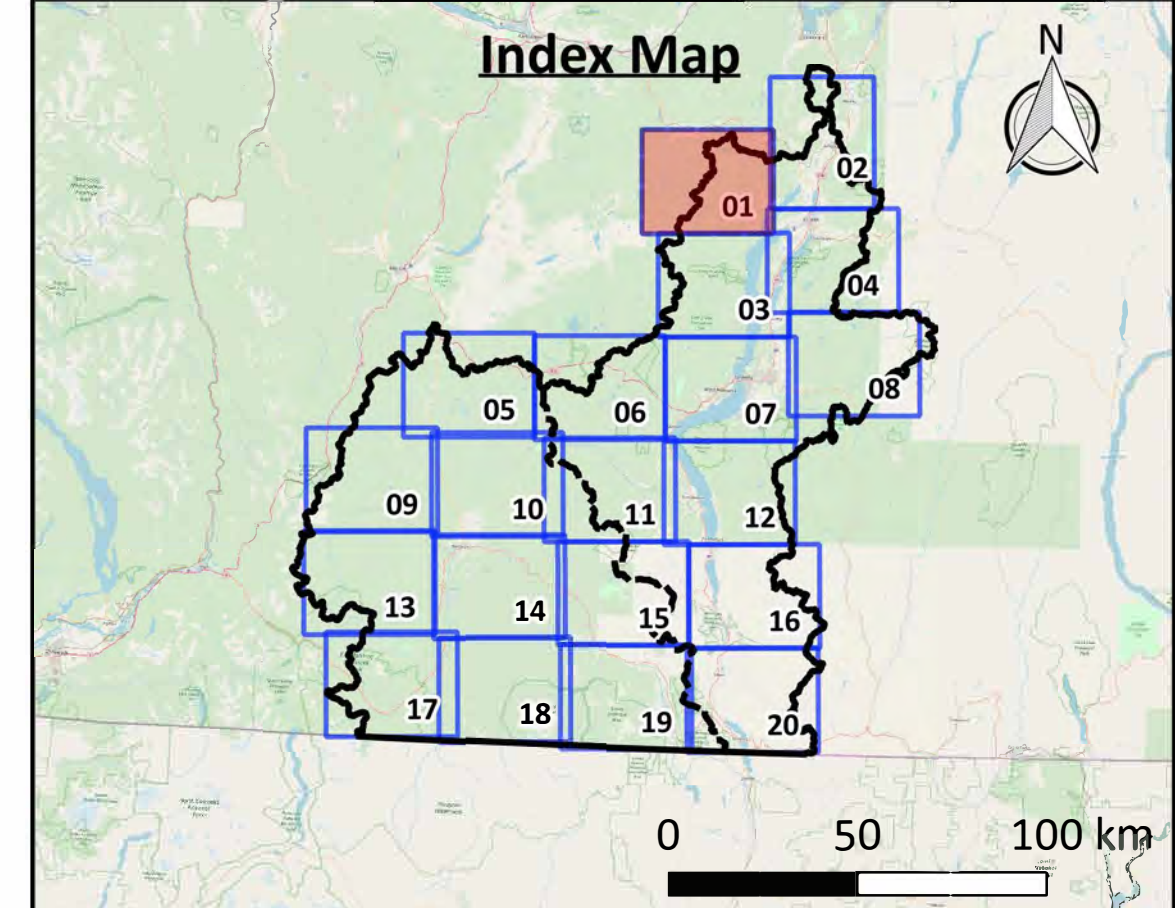
Watershed Boundary	Affected Assets Total Land Value \$1 - \$250,000
Okanagan-Similkameen Boundary	\$250,000 - \$500,000
Canada - US Border	\$500,000 - \$1,000,000
Lakes	\$1,000,000 - \$2,000,000
Watercourses	\$2,000,000 +
Highway	
Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylx (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy - Similkameen

ANSI D - Map No. EC-D-002-003

Zoom-In Map



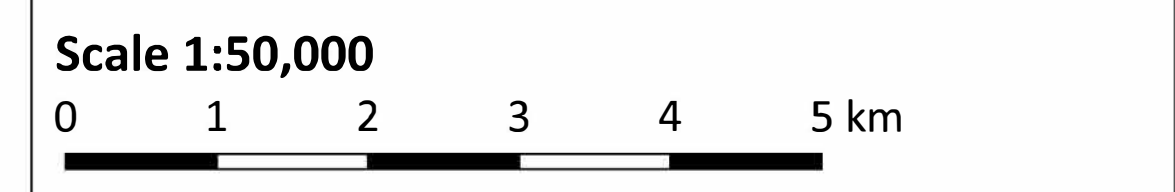
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

1. Map produced by Ebbwater Consulting Inc.
2. Land values are based on BC Assessment data using land parcels. The data are known to be incomplete, especially on reserve lands. The gap on reserve lands has been addressed by applying average property values to building footprints as a proxy.
3. The land values (exposure) layer was clipped to the debris flow hazard area. The hazard layer is shown in the hazard maps, and was produced by Palmer Environmental Consulting Group Inc. The method used to produce the hazard layer is described in the Quantitative Study.

Data Sources

1. Lakes and Watercourses, Roads and Trails, and Reserves: BC Data Catalogue.
2. Land Values: BC Assessment Data and Building Footprints.
3. Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
4. Sylix Place Names: Okanagan Nation Alliance.
5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



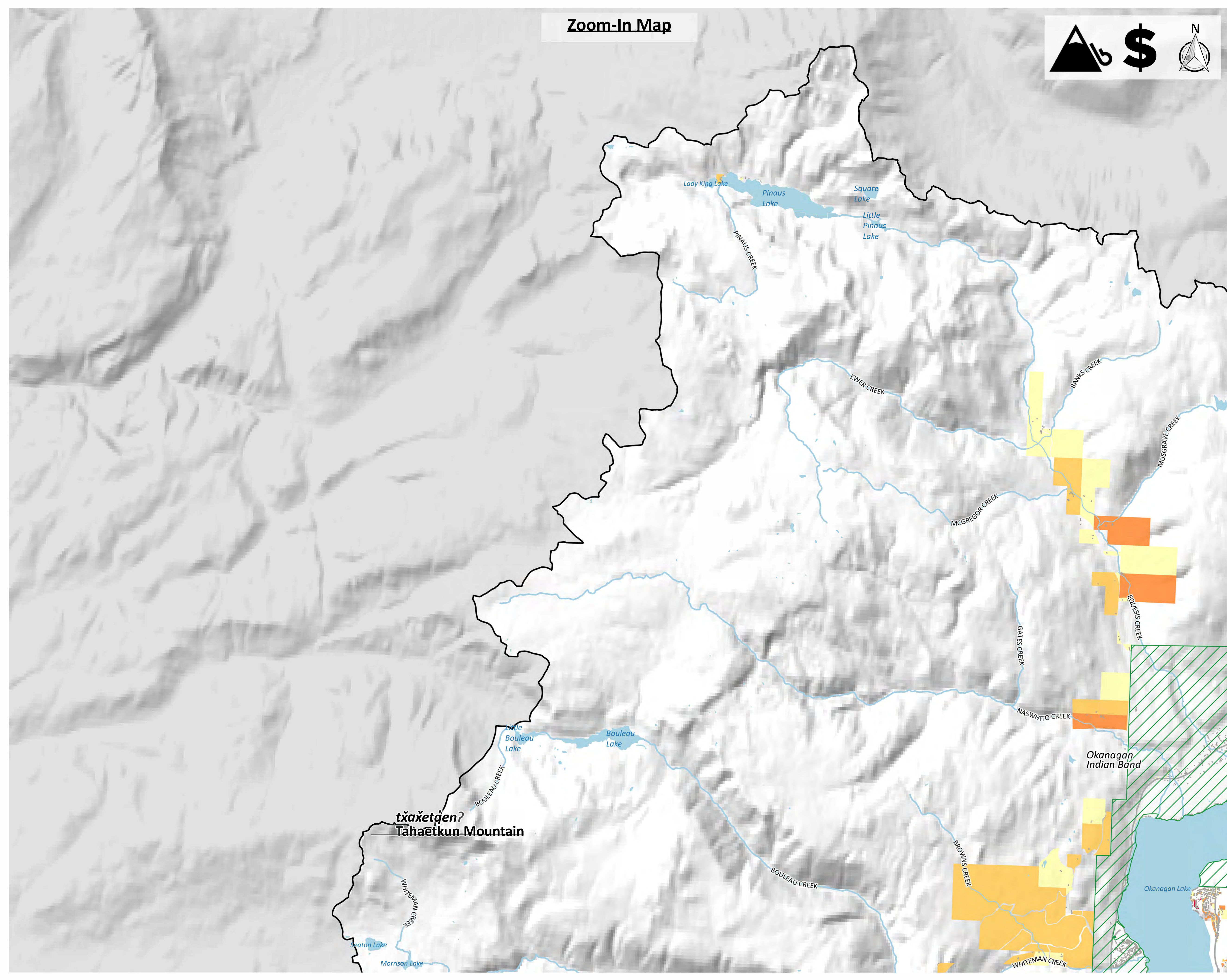
Legend

Background	Affected Assets
— Watershed Boundary	Total Land Value
- - Okanagan-Similkameen Boundary	Yellow \$1 - \$250,000
— Canada - US Border	Orange \$250,000 - \$500,000
▨ Reserves	Dark Orange \$500,000 - \$1,000,000
▨ Lakes	Red \$1,000,000 - \$2,000,000
▨ Watercourses	Dark Red \$2,000,000 +
▨ Highway	
▨ Major Road	

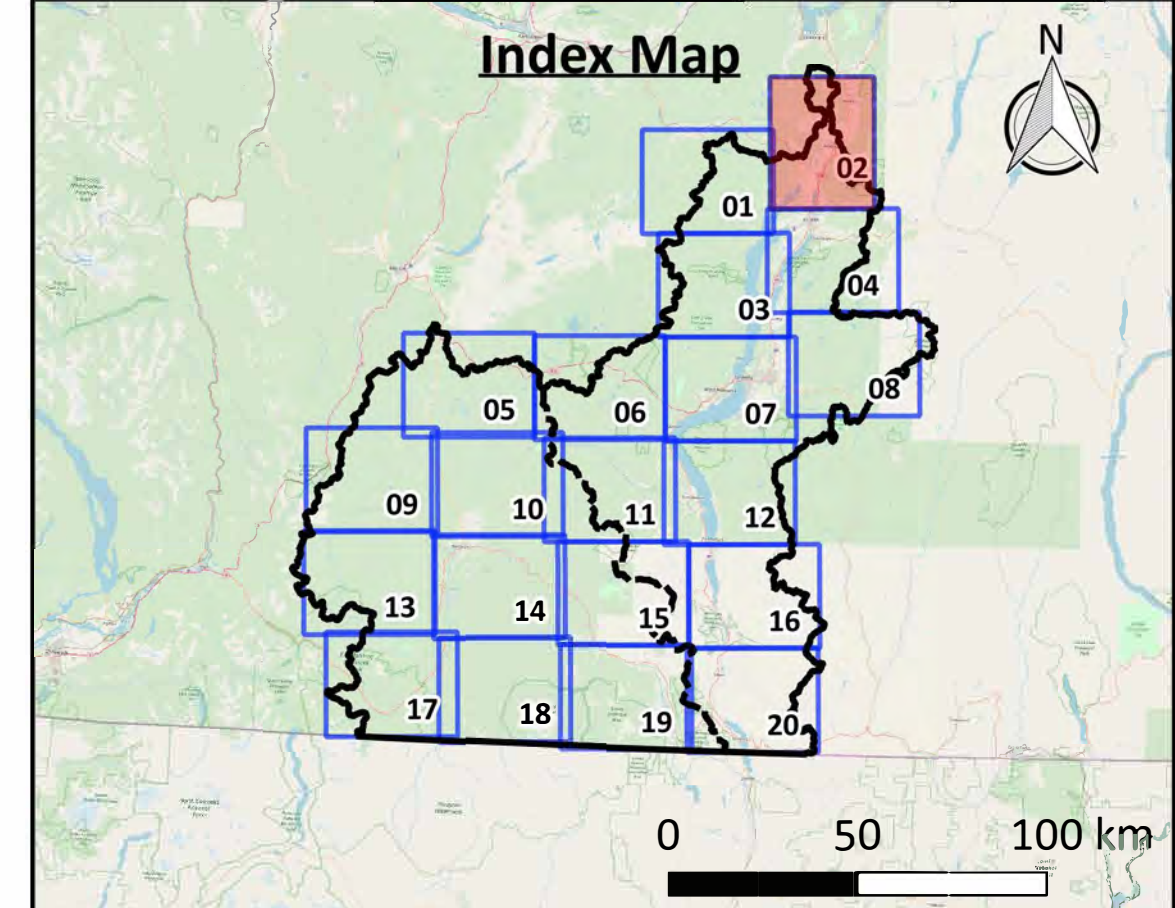
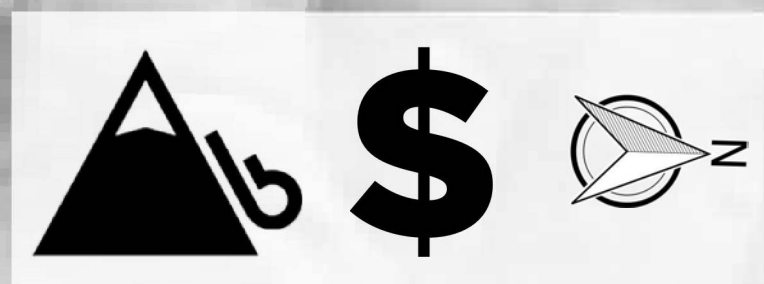
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 01 of 20

ANSI D - Map No. EC-D-001-001



Zoom-In Map



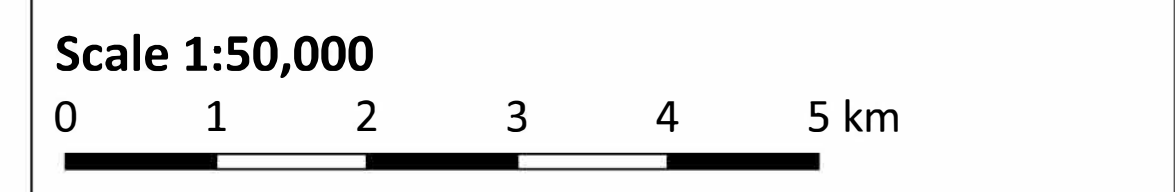
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Map Notes

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Data Sources

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5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



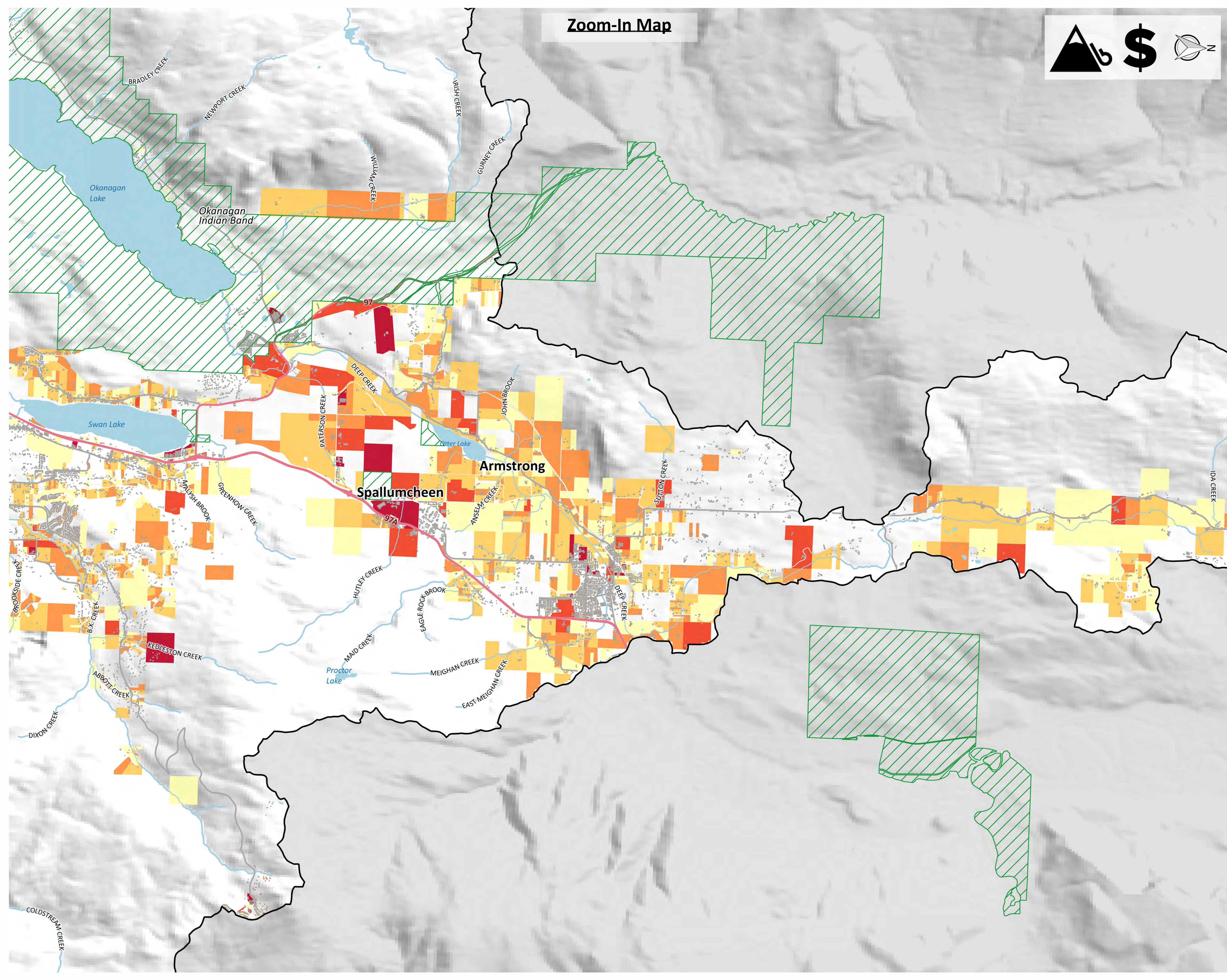
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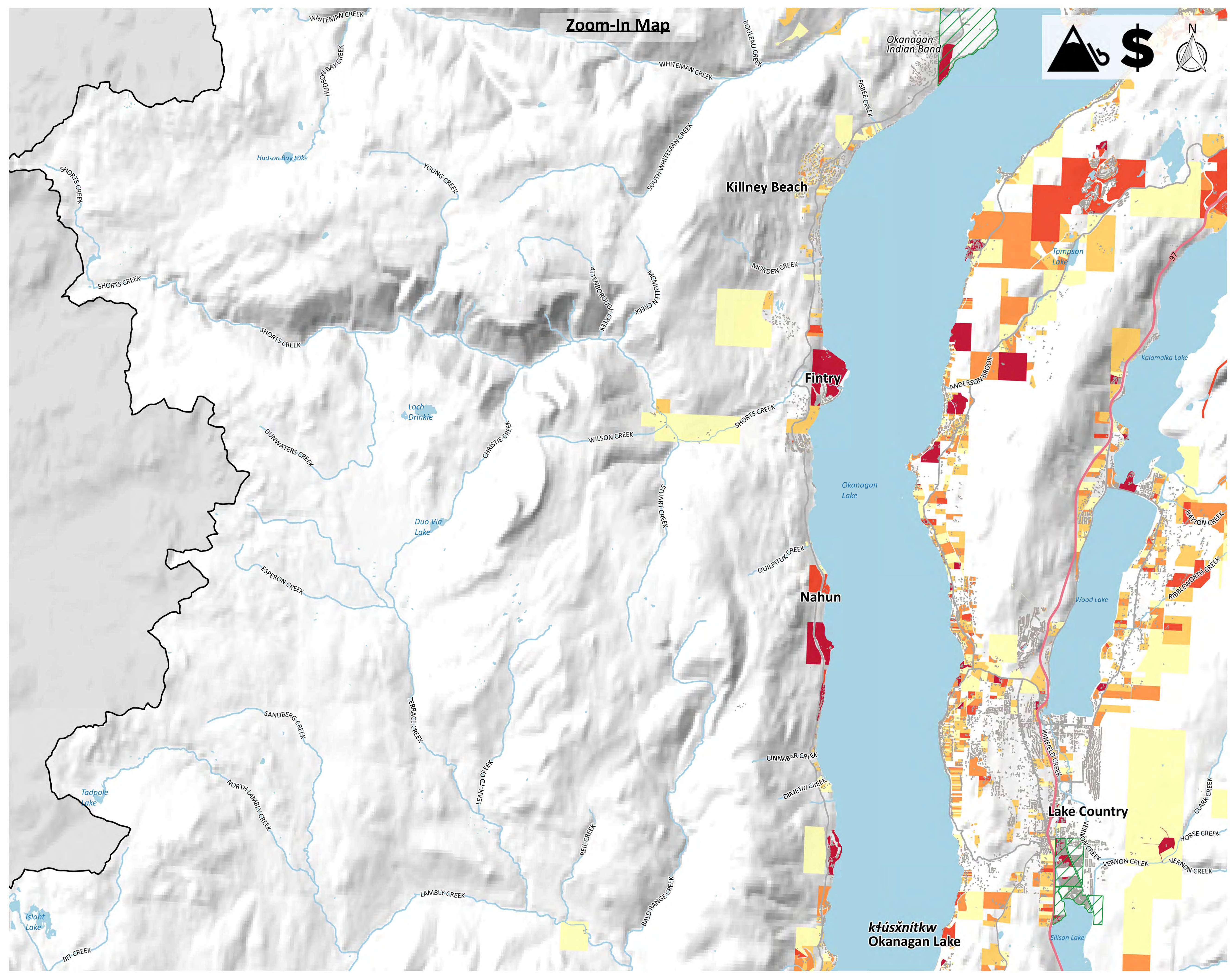
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▨ Reserves	Red-Orange: \$500,000 - \$1,000,000
— Lakes	Red: \$1,000,000 - \$2,000,000
— Watercourses	Dark Red: \$2,000,000 +
— Highway	
— Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

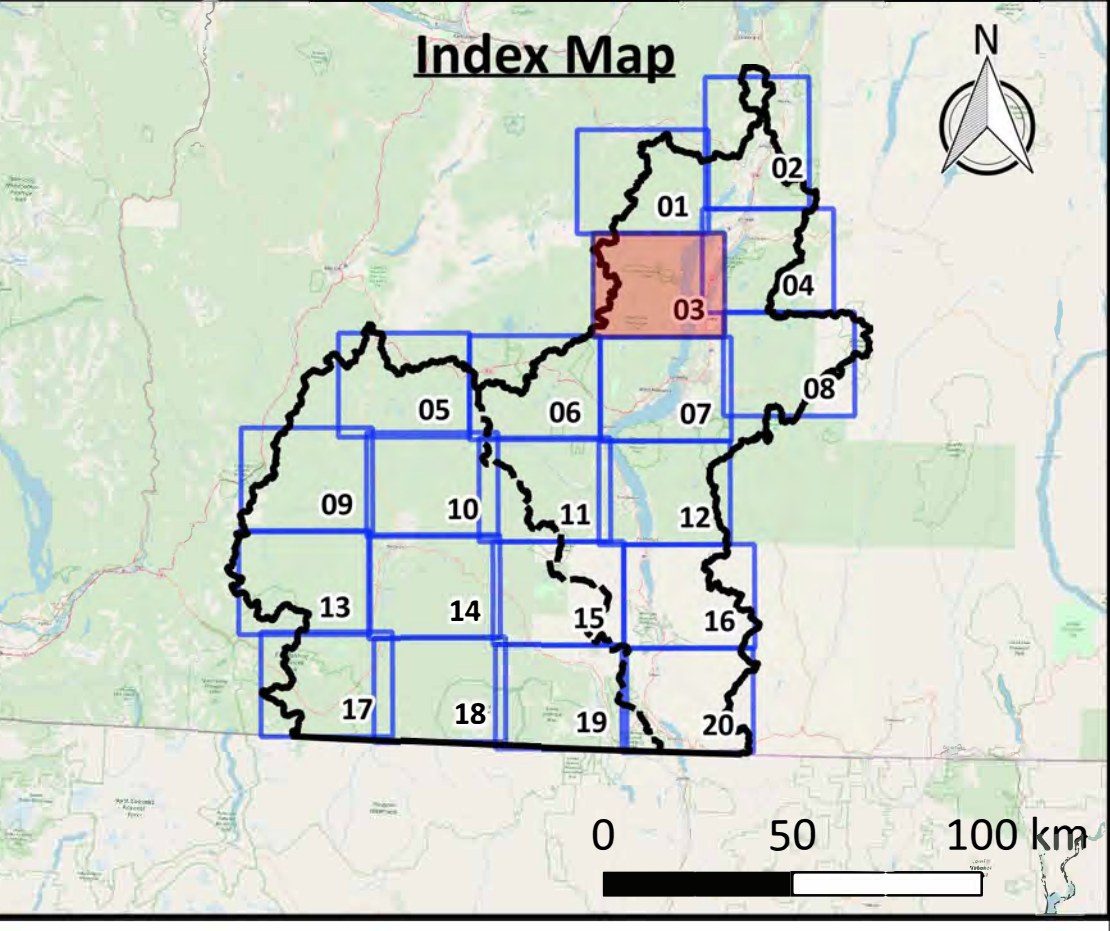
Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 02 of 20

ANSI D - Map No. EC-D-001-002





Zoom-In Map



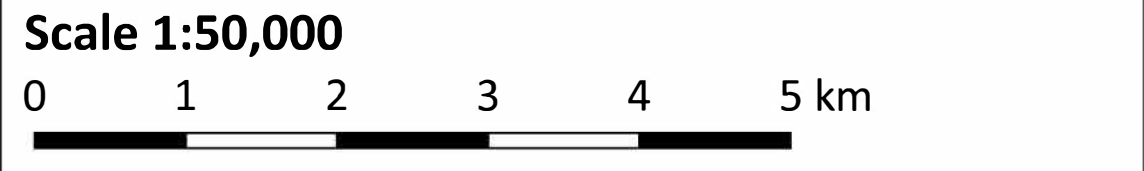
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[Click here to return to Similkameen map](#)

Map Notes

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4. Sylix Place Names: Okanagan Nation Alliance.
5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



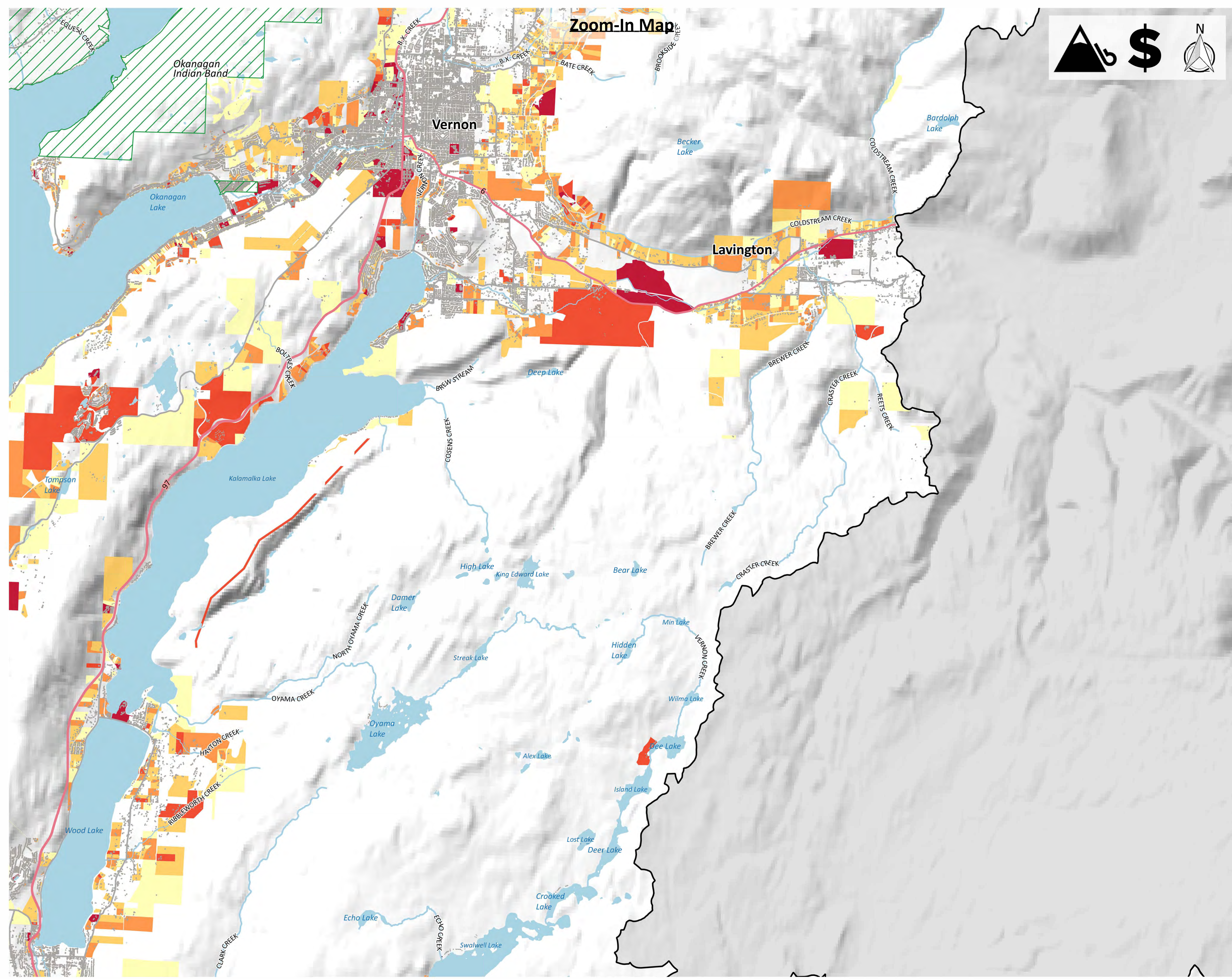
Legend

Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Light Orange: \$250,000 - \$500,000
▭ Reserves	Orange: \$500,000 - \$1,000,000
▭ Lakes	Dark Orange: \$1,000,000 - \$2,000,000
▭ Watercourses	Red: \$2,000,000 +
▭ Highway	
▭ Major Road	

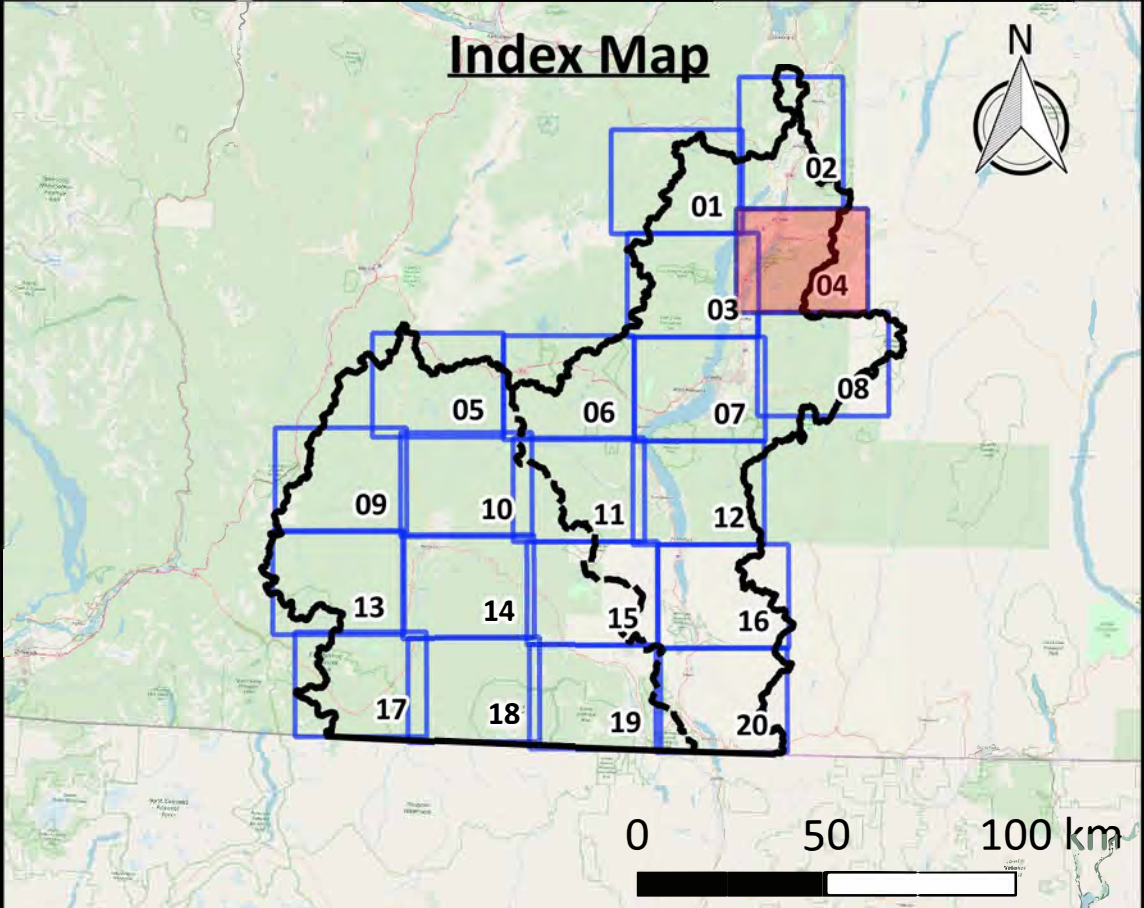
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 03 of 20

ANSI D - Map No. EC-D-001-003



Zoom-In Map



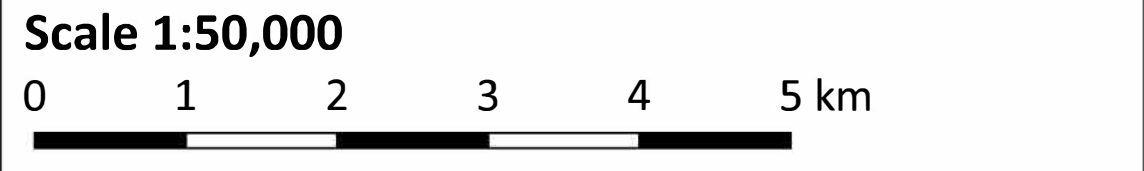
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[Click here to return to Similkameen map](#)

Map Notes

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5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



Legend

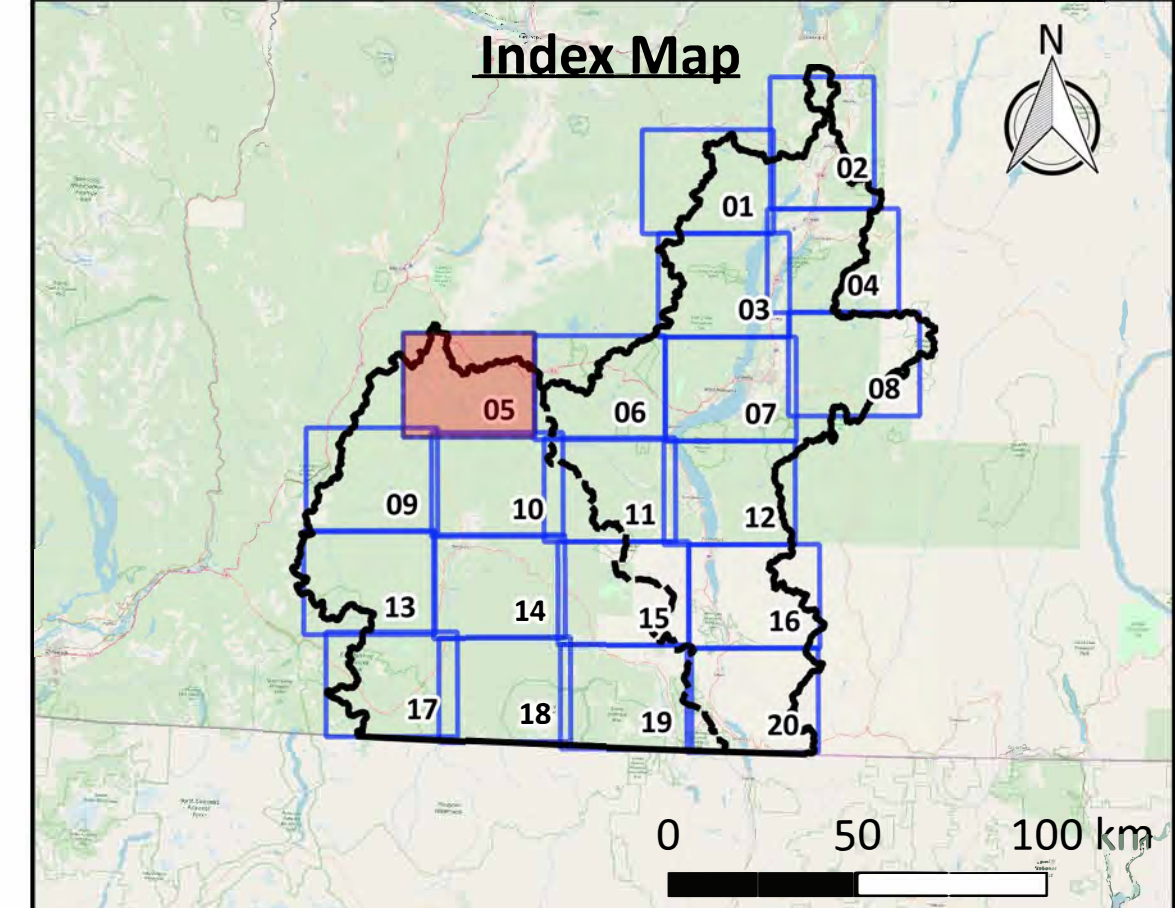
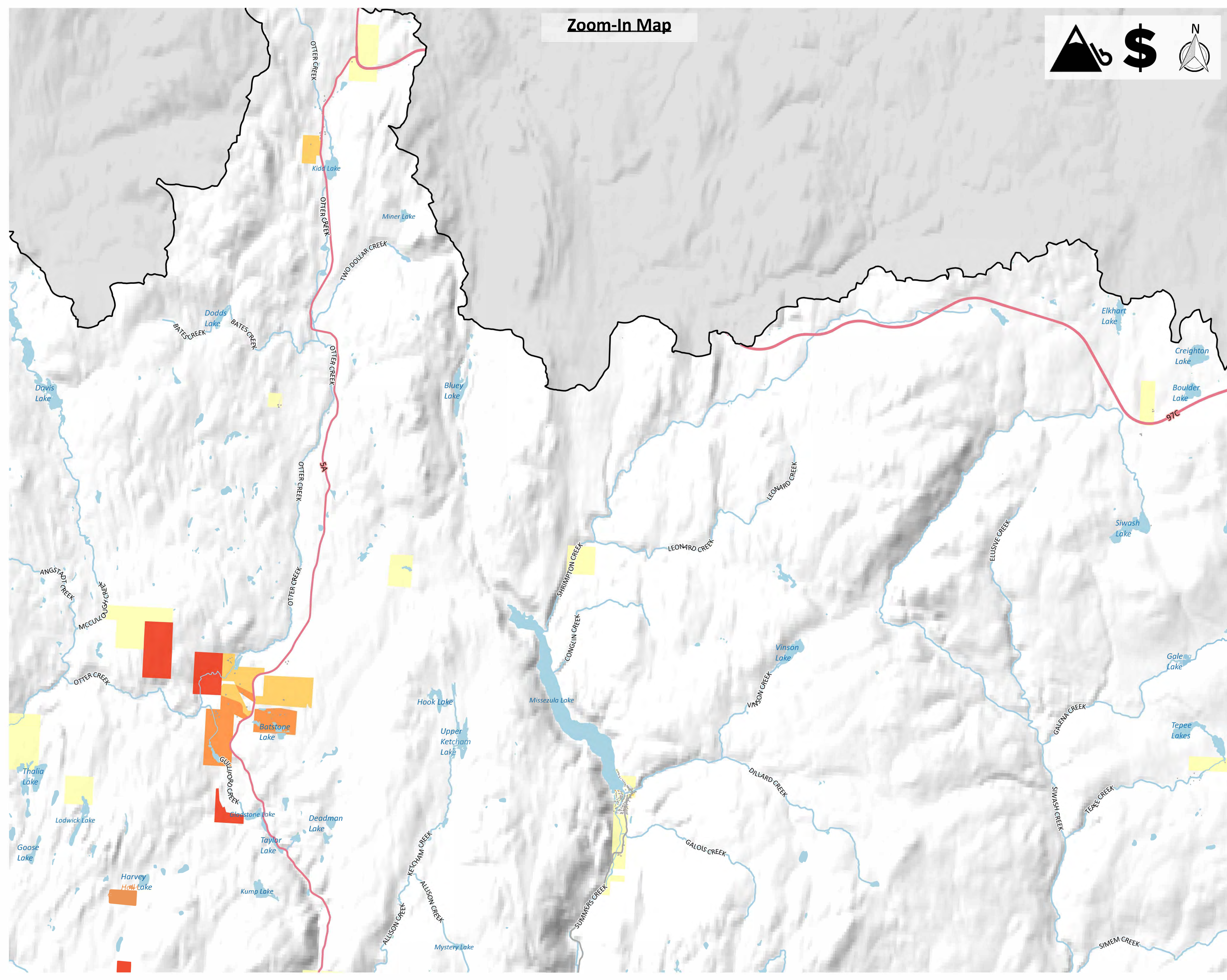
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▭ Reserves	Dark Orange: \$500,000 - \$1,000,000
▭ Lakes	Red: \$1,000,000 - \$2,000,000
▭ Watercourses	Dark Red: \$2,000,000 +
▭ Highway	
▭ Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 04 of 20

ANSI D - Map No. EC-D-001-004

Zoom-In Map



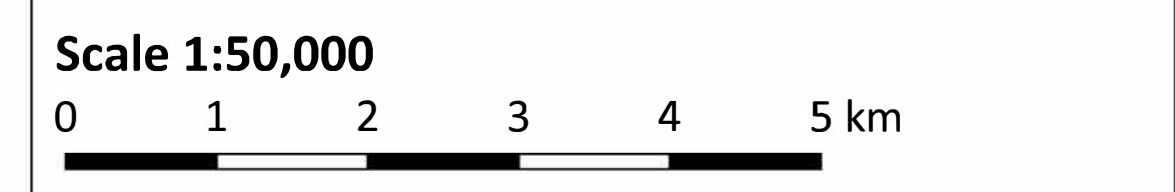
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[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

1. Map produced by Ebbwater Consulting Inc.
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Data Sources

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4. Sylix Place Names: Okanagan Nation Alliance.
5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



Legend

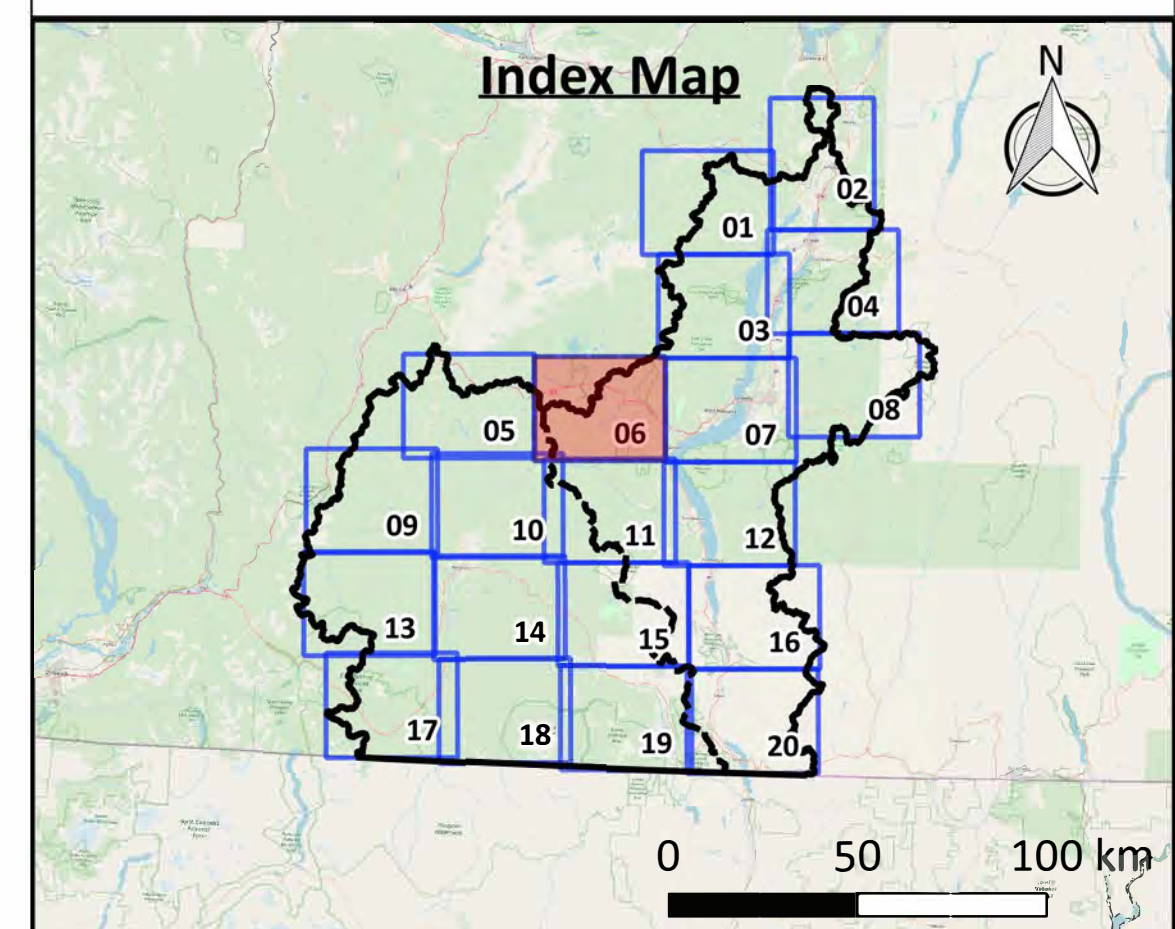
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow \$1 - \$250,000
— Canada - US Border	Orange \$250,000 - \$500,000
▨ Reserves	Red \$500,000 - \$1,000,000
— Watercourses	Dark Red \$1,000,000 - \$2,000,000
— Highway	Black \$2,000,000 +
— Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 05 of 20

ANSI D - Map No. EC-D-001-005

Zoom-In Map



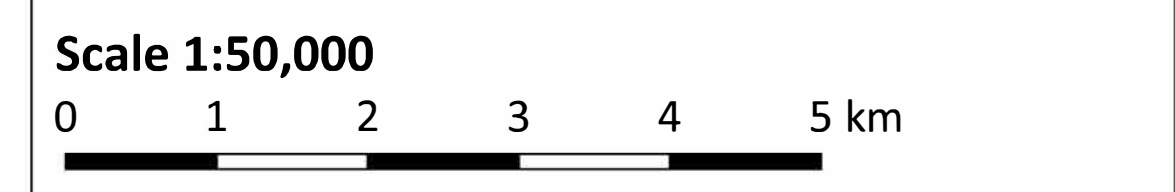
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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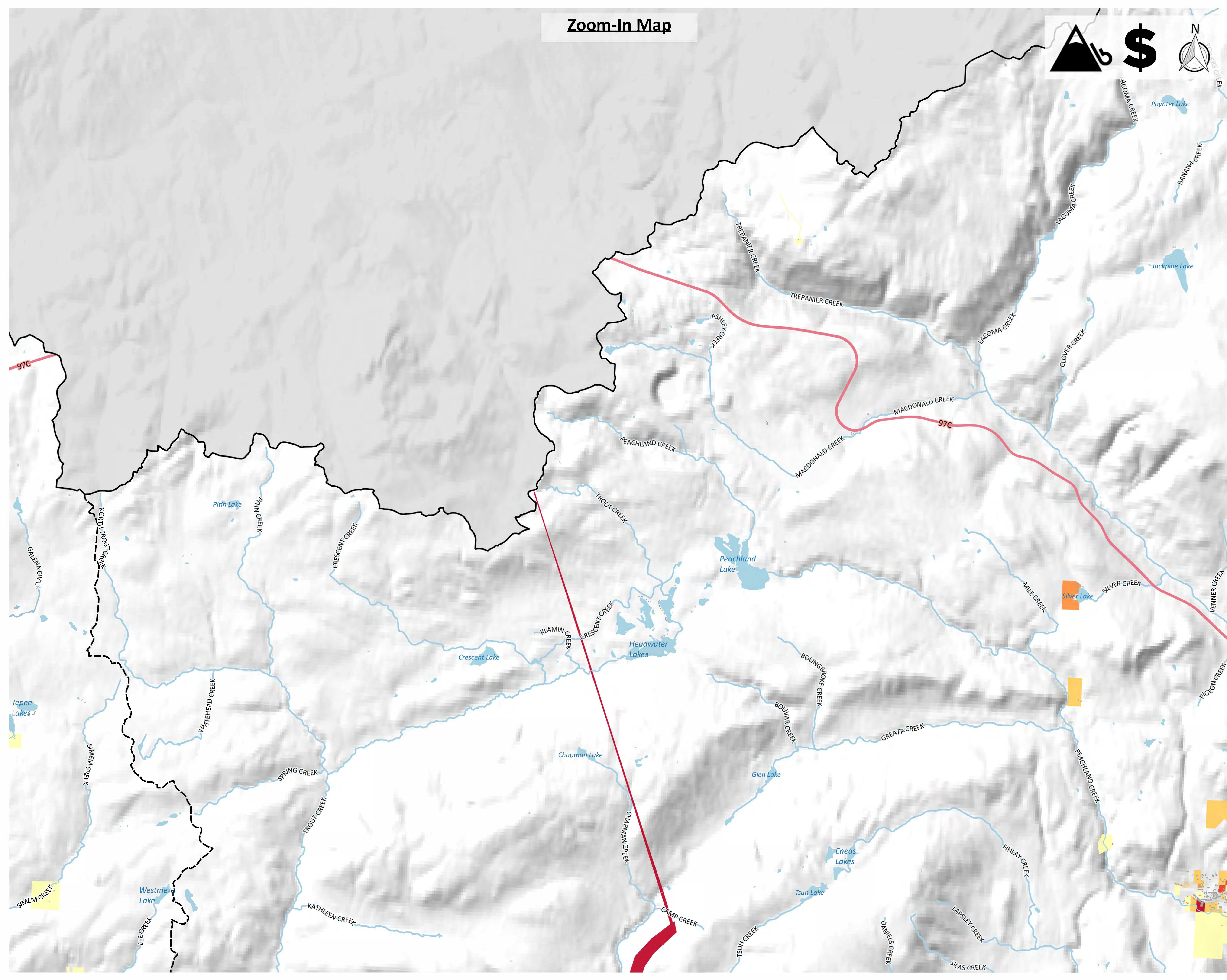
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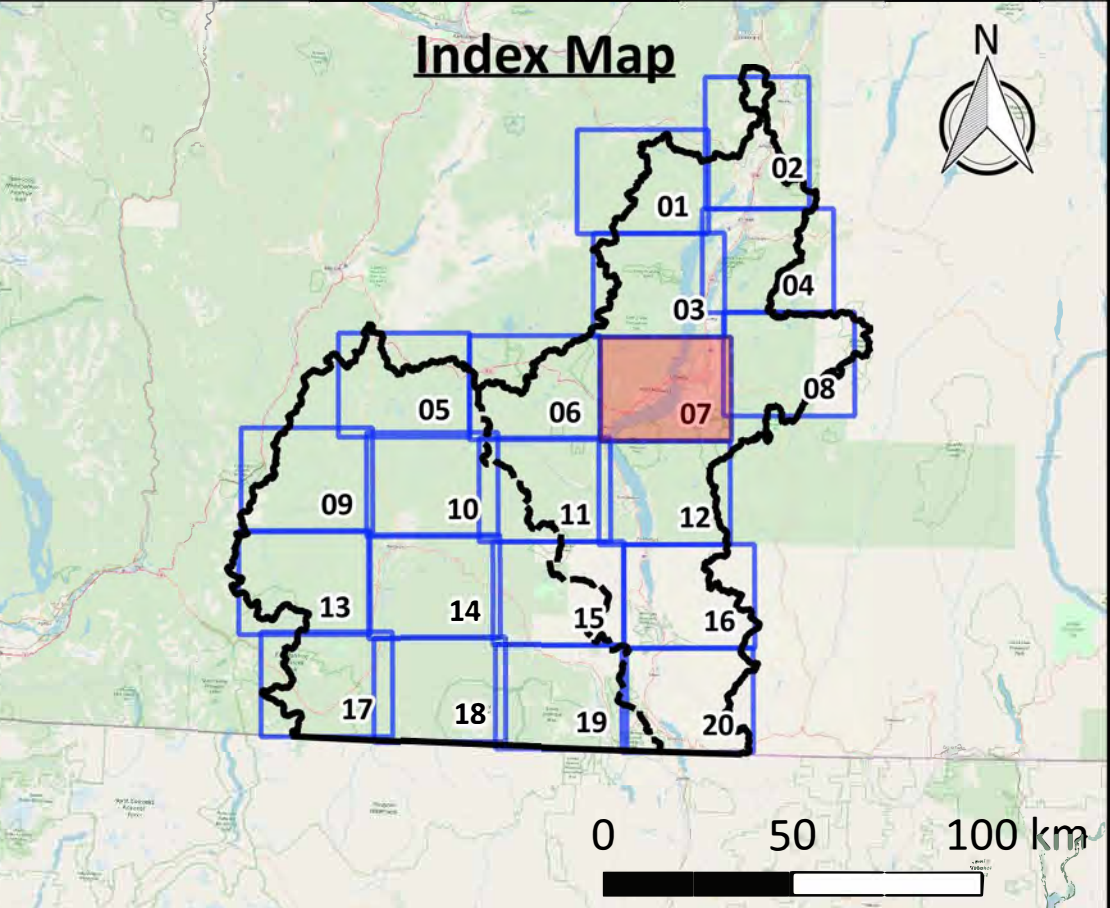
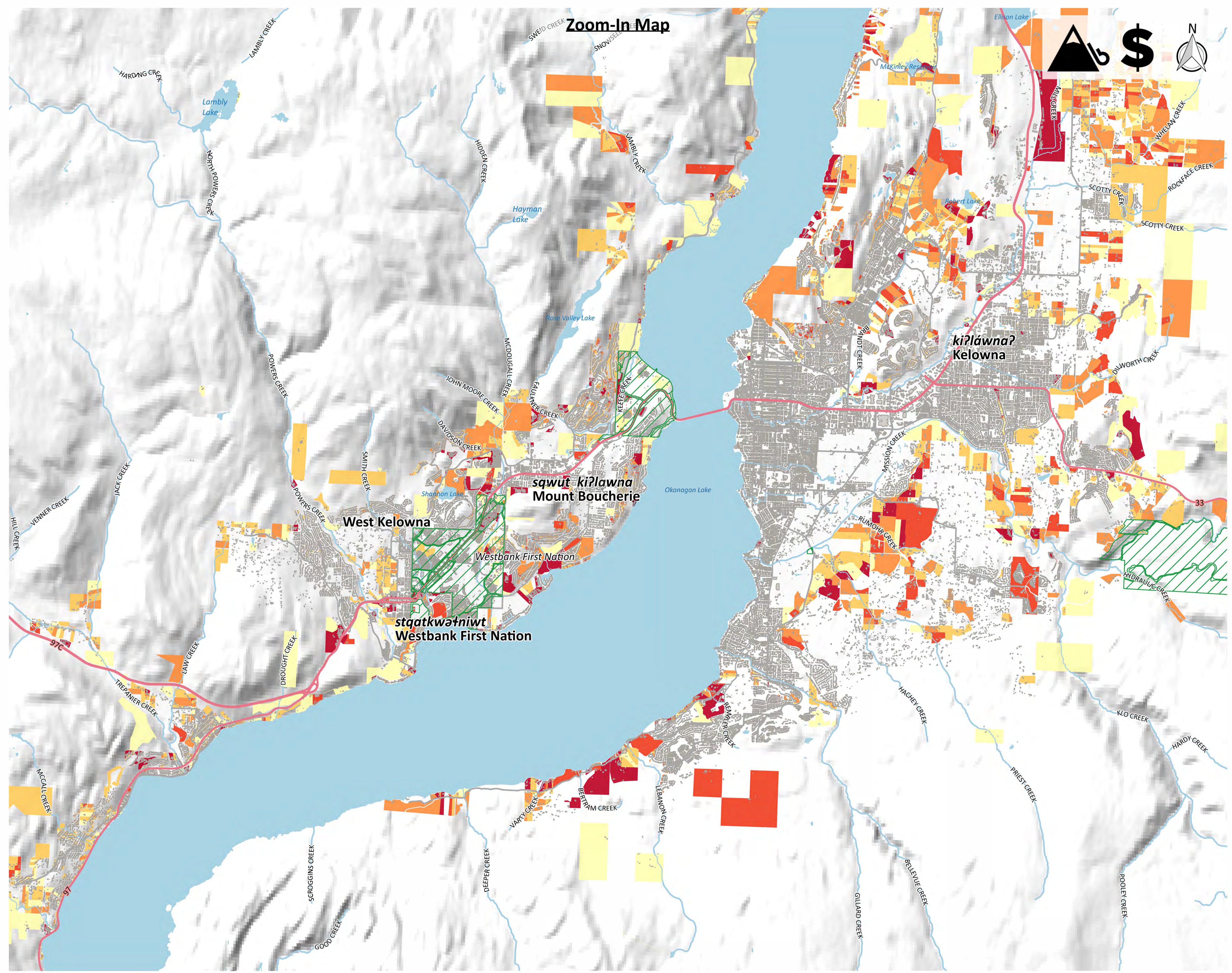
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▭ Reserves	Light Blue: \$500,000 - \$1,000,000
▭ Lakes	Dark Blue: \$1,000,000 - \$2,000,000
▭ Watercourses	Red: \$2,000,000 +
▭ Highway	
▭ Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
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ANSI D - Map No. EC-D-001-006





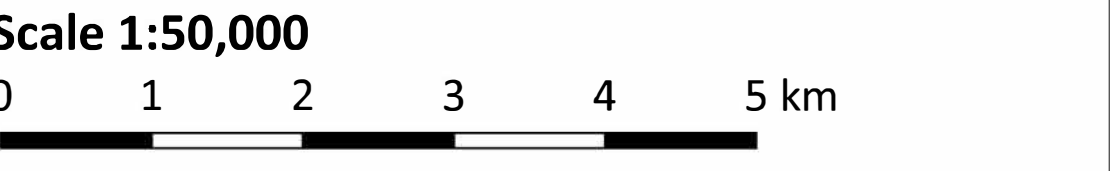
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[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

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Data Sources

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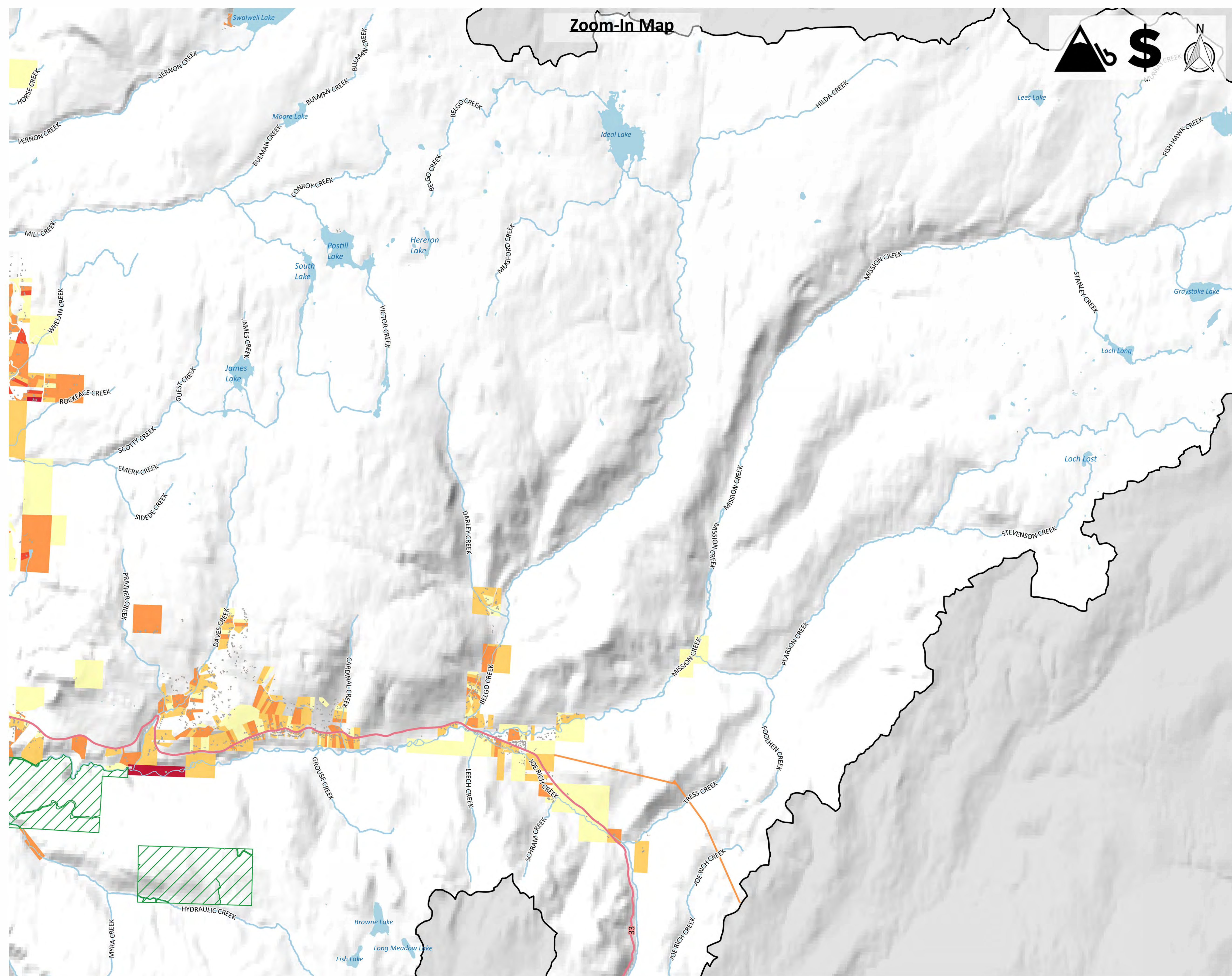


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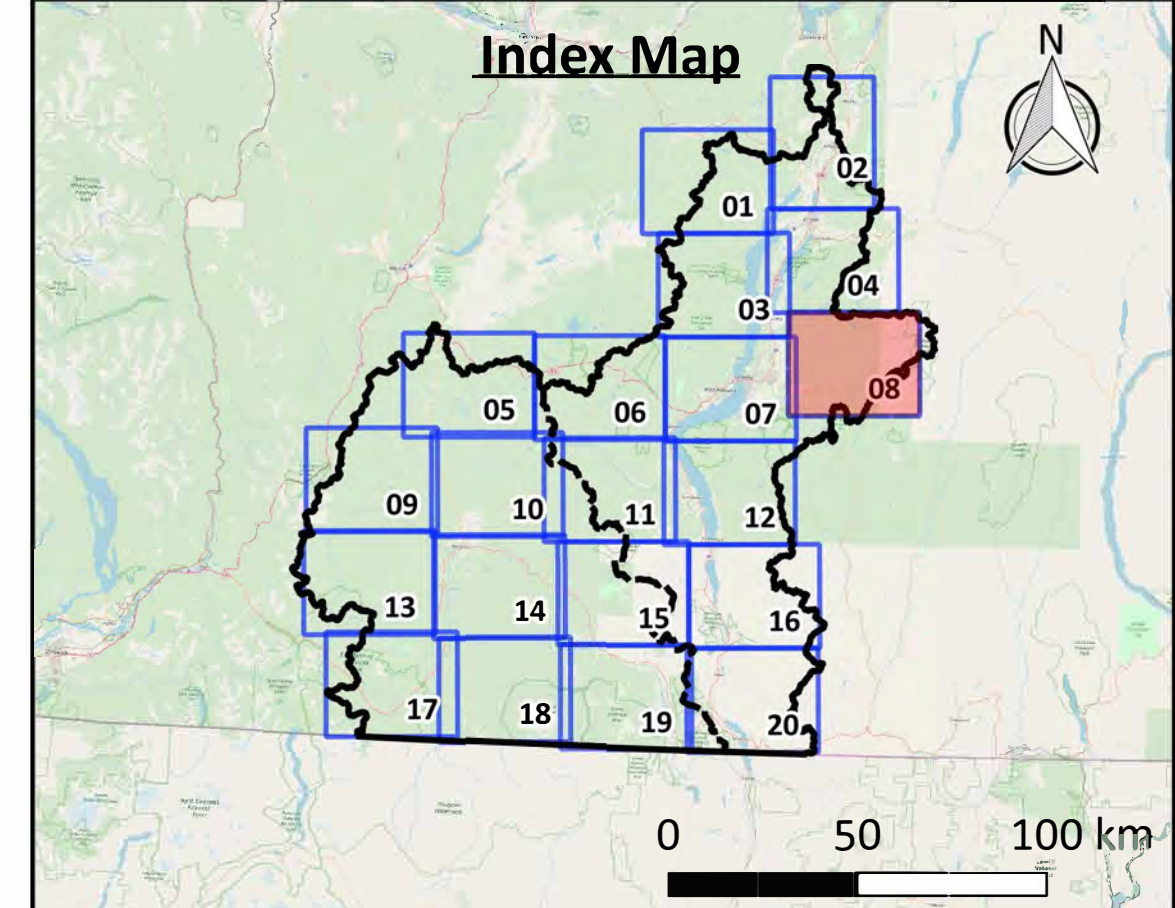
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▭ Reserves	Dark Orange: \$500,000 - \$1,000,000
▭ Lakes	Red: \$1,000,000 - \$2,000,000
▭ Watercourses	Dark Red: \$2,000,000 +
▭ Highway	
▭ Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 07 of 20



Zoom-In Map



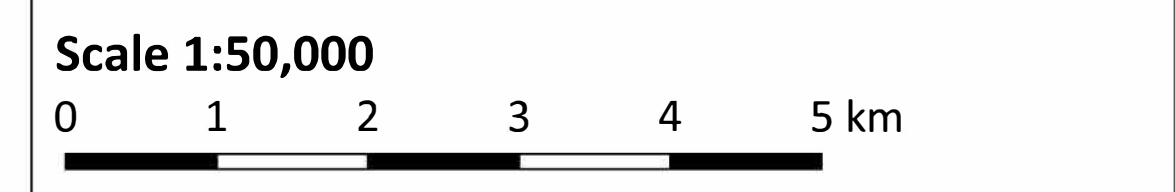
[Click above map tile for Zoom-In map](#)
[Click here to return to Project Area map](#)
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[Click here to return to Similkameen map](#)

Map Notes

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Legend

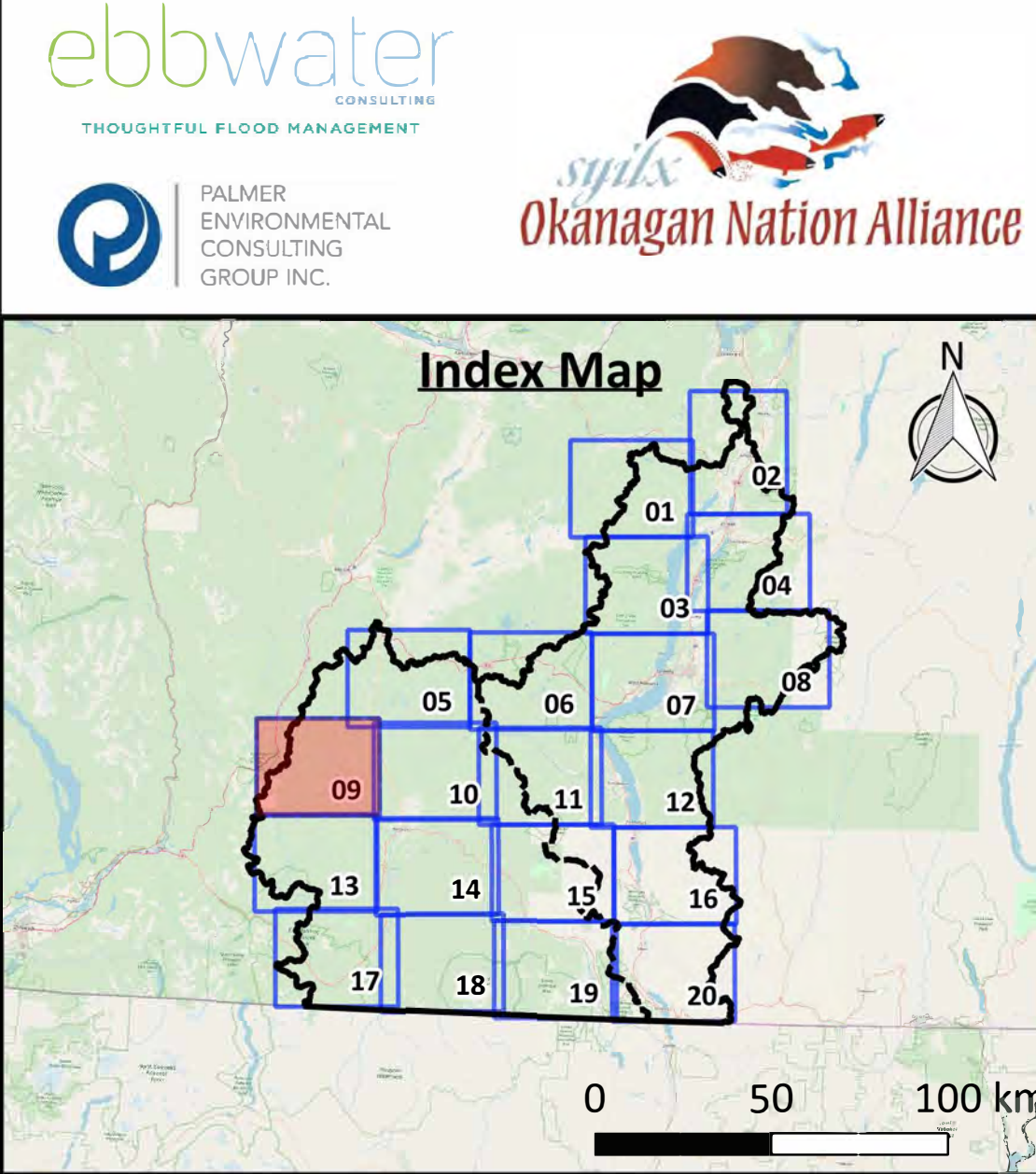
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▨ Reserves	Red-Orange: \$500,000 - \$1,000,000
— Lakes	Red: \$1,000,000 - \$2,000,000
— Watercourses	Dark Red: \$2,000,000 +
— Highway	
— Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
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ANSI D - Map No. EC-D-001-008

Zoom-In Map



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[Click here to return to Similkameen map](#)

- Map Notes**
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- Data Sources**
1. Lakes and Watercourses, Roads and Trails, and Reserves: BC Data Catalogue.
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 5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



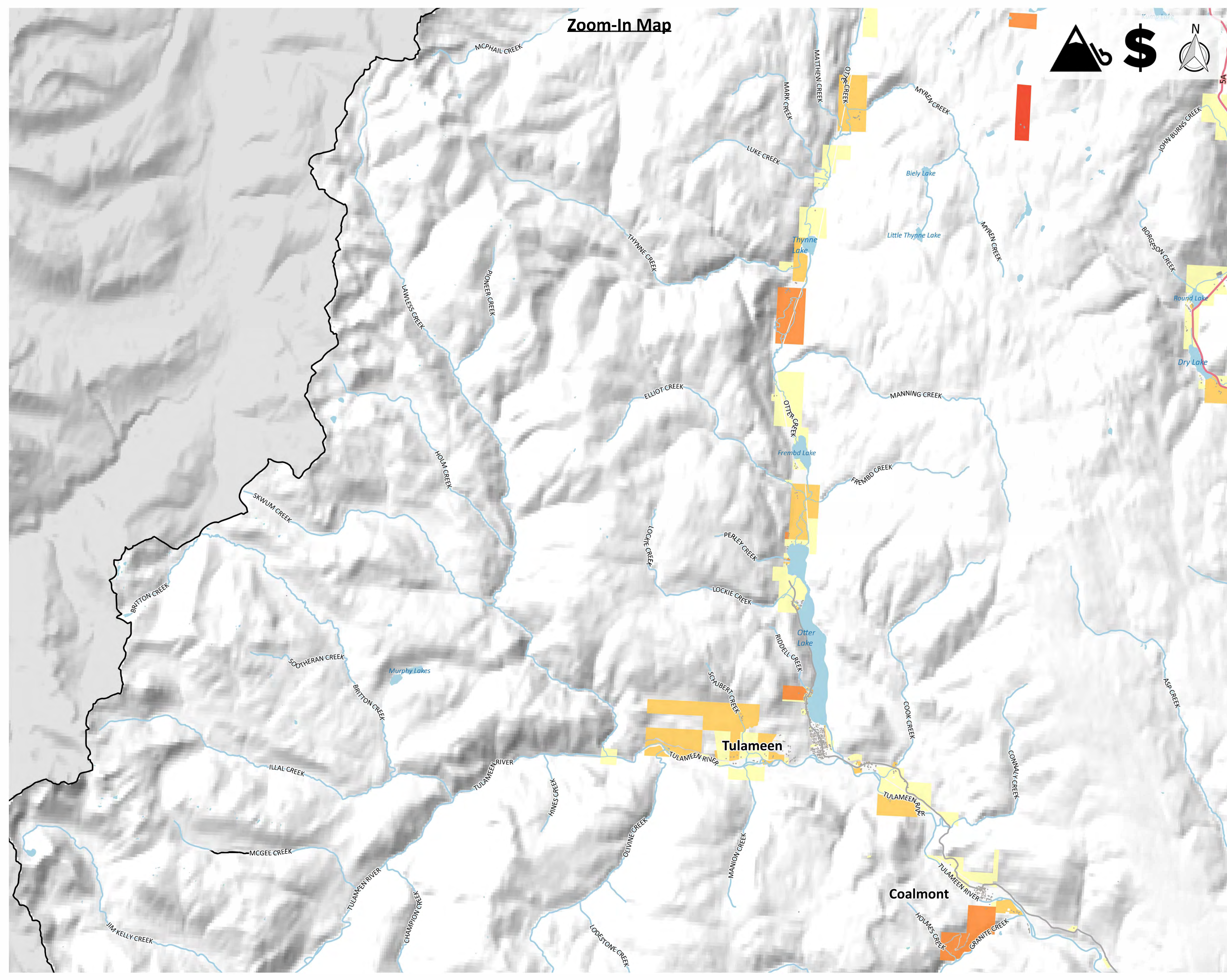
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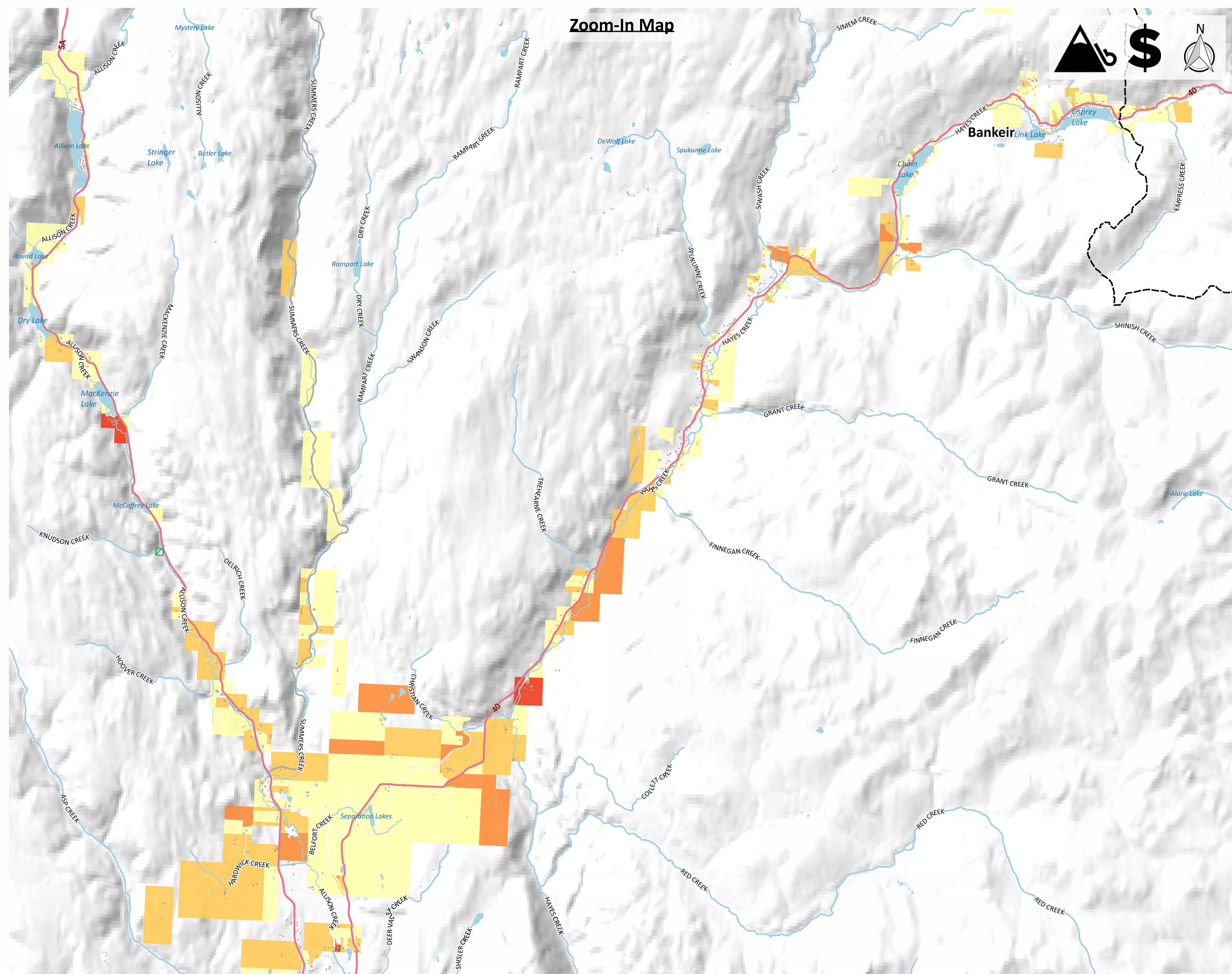
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - Okanagan-Similkameen Boundary	Light Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▭ Reserves	Dark Orange: \$500,000 - \$1,000,000
▭ Lakes	Red: \$1,000,000 - \$2,000,000
▭ Watercourses	Dark Red: \$2,000,000 +
▬ Highway	
▬ Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

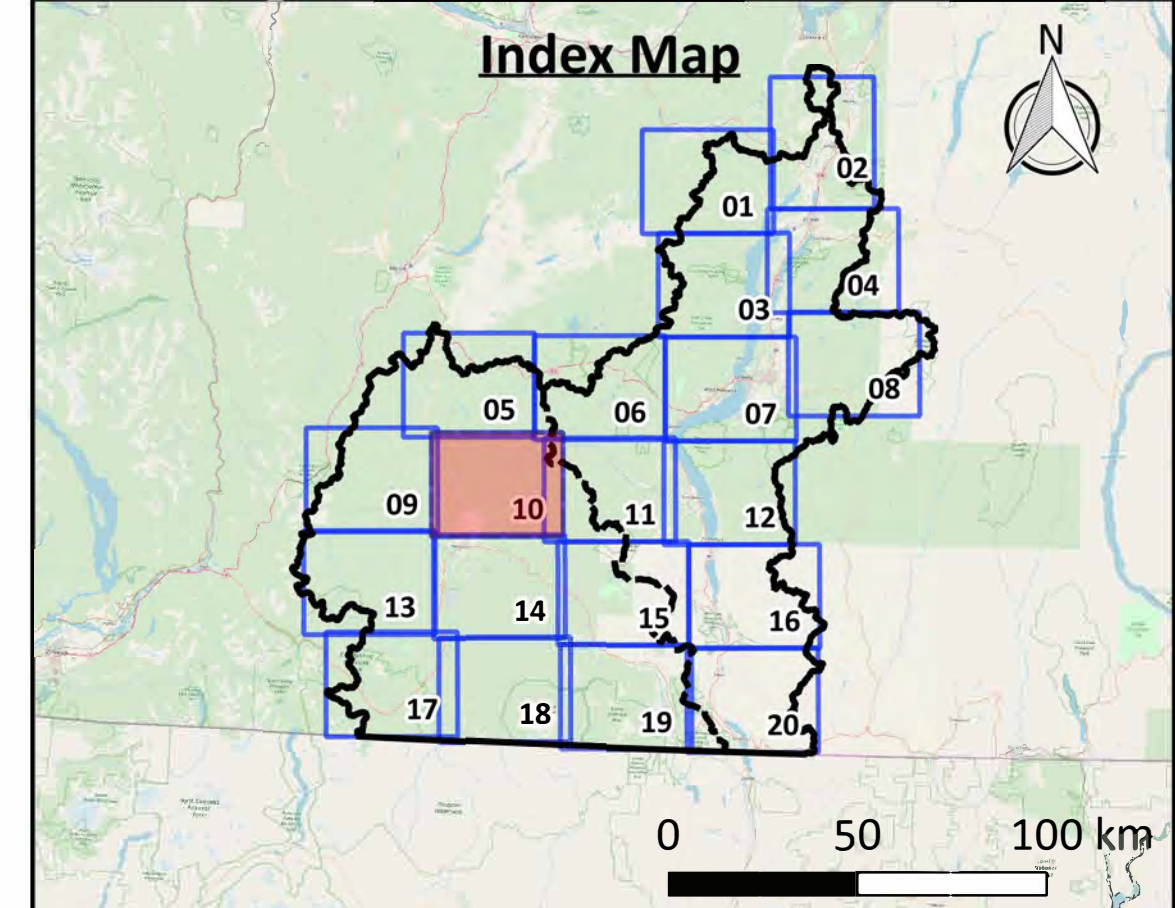
Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
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ANSI D - Map No. EC-D-001-009





Zoom-In Map



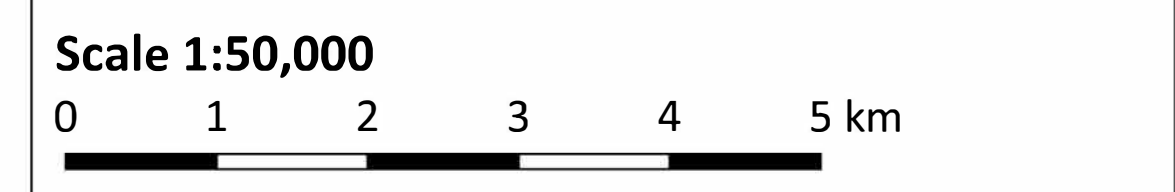
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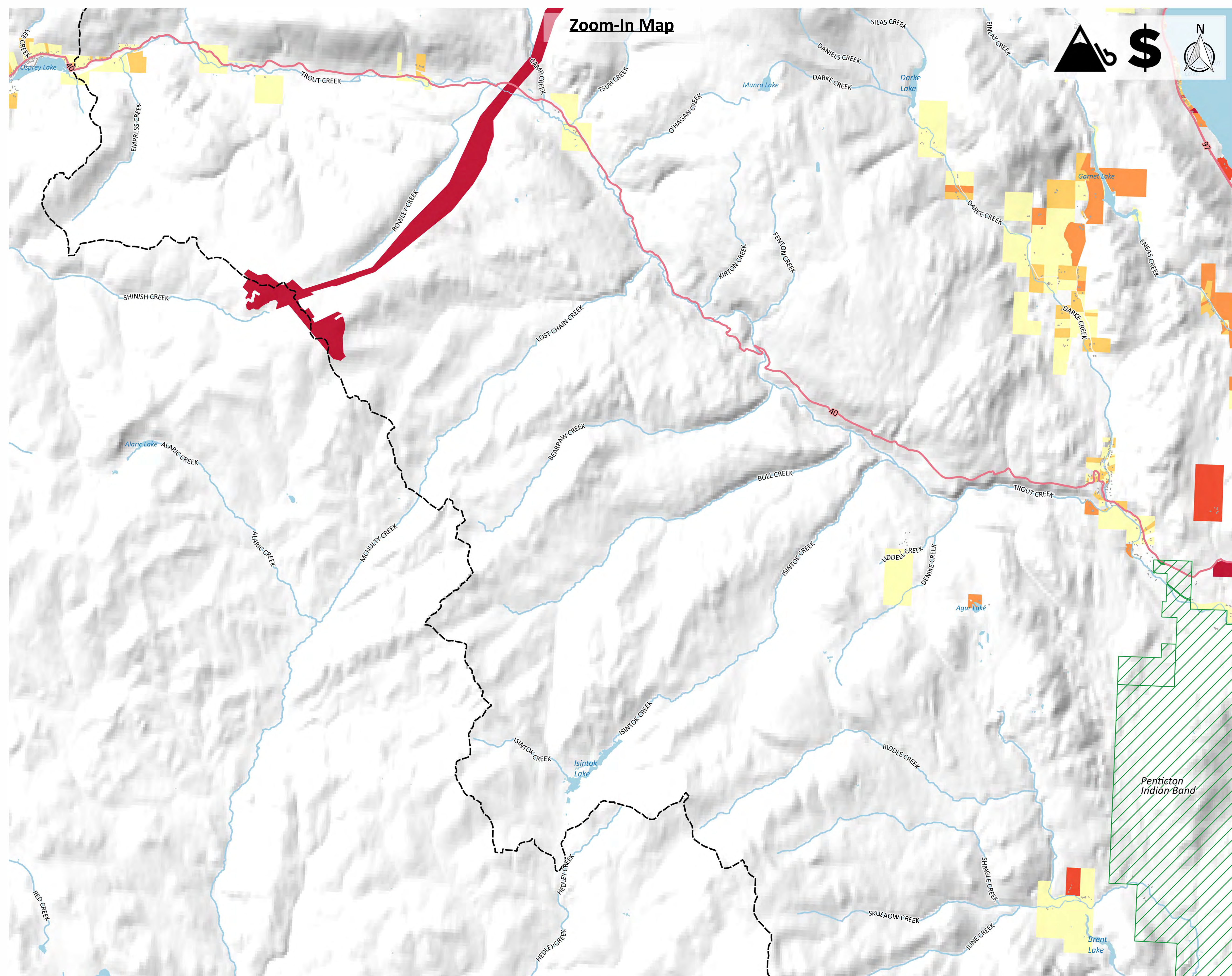
Legend

Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Light Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▭ Reserves	Dark Orange: \$500,000 - \$1,000,000
— Lakes	Red: \$1,000,000 - \$2,000,000
— Watercourses	Dark Red: \$2,000,000 +
— Highway	
— Major Road	

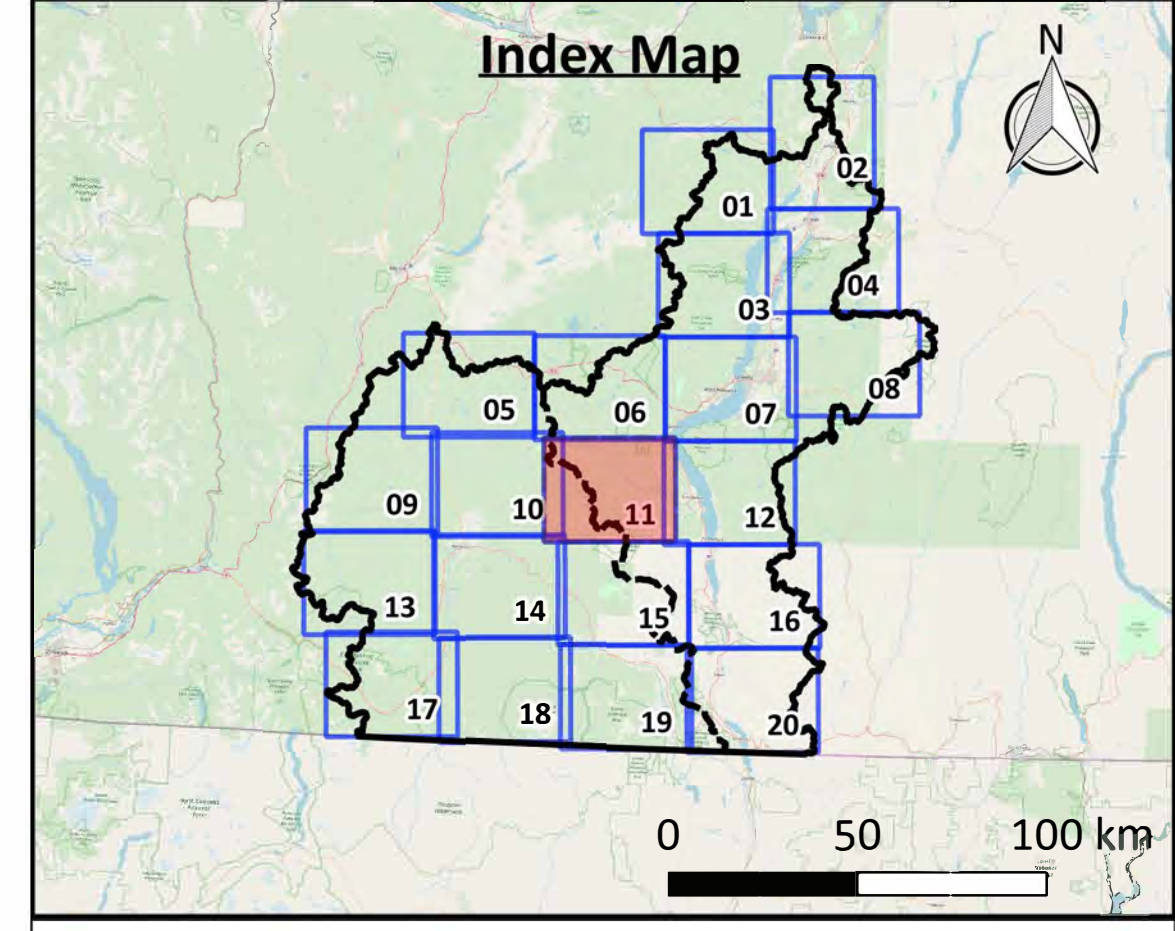
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
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ANSI D - Map No. EC-D-001-010



Zoom-In Map



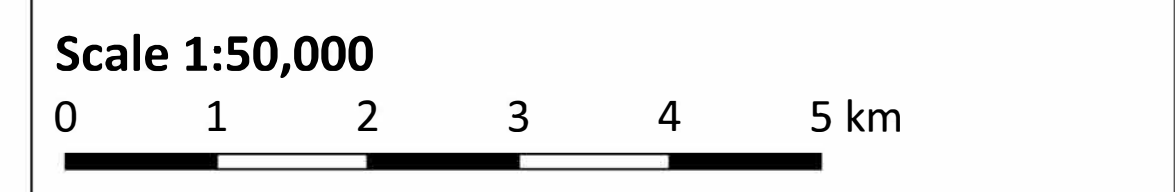
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[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

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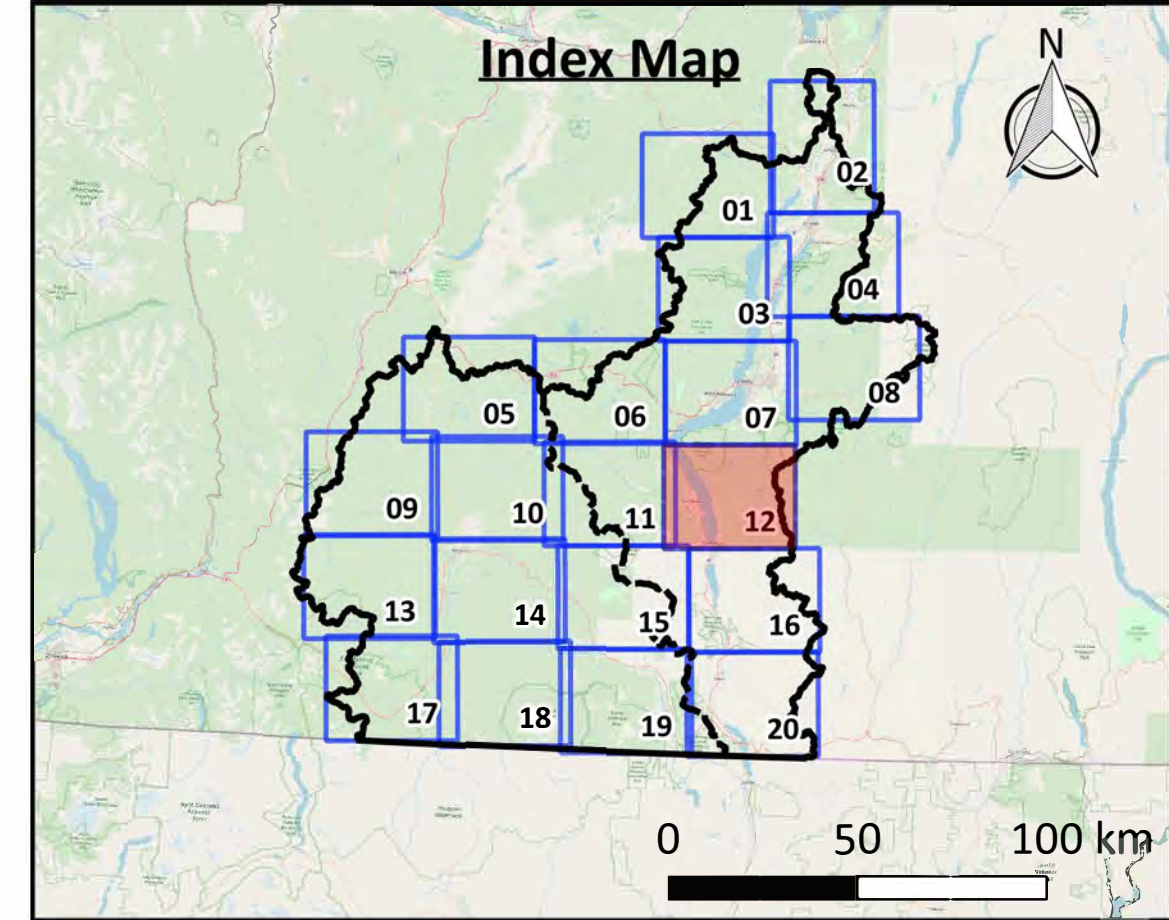
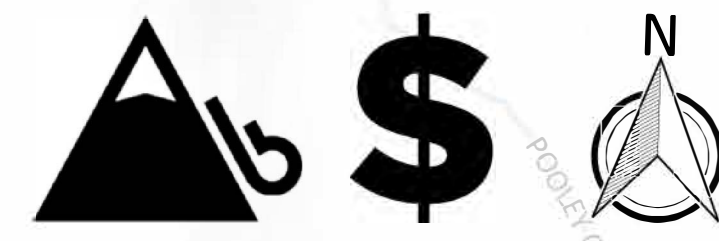
Legend

Background	Affected Assets
— Watershed Boundary	Total Land Value
- - Okanagan-Similkameen Boundary	Yellow \$1 - \$250,000
— Canada - US Border	Orange \$250,000 - \$500,000
▨ Reserves	Red \$500,000 - \$1,000,000
▨ Lakes	Dark Red \$1,000,000 - \$2,000,000
▨ Watercourses	Red \$2,000,000 +
▨ Highways	
▨ Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
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Zoom-In Map



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Scale 1:50,000
 0 1 2 3 4 5 km

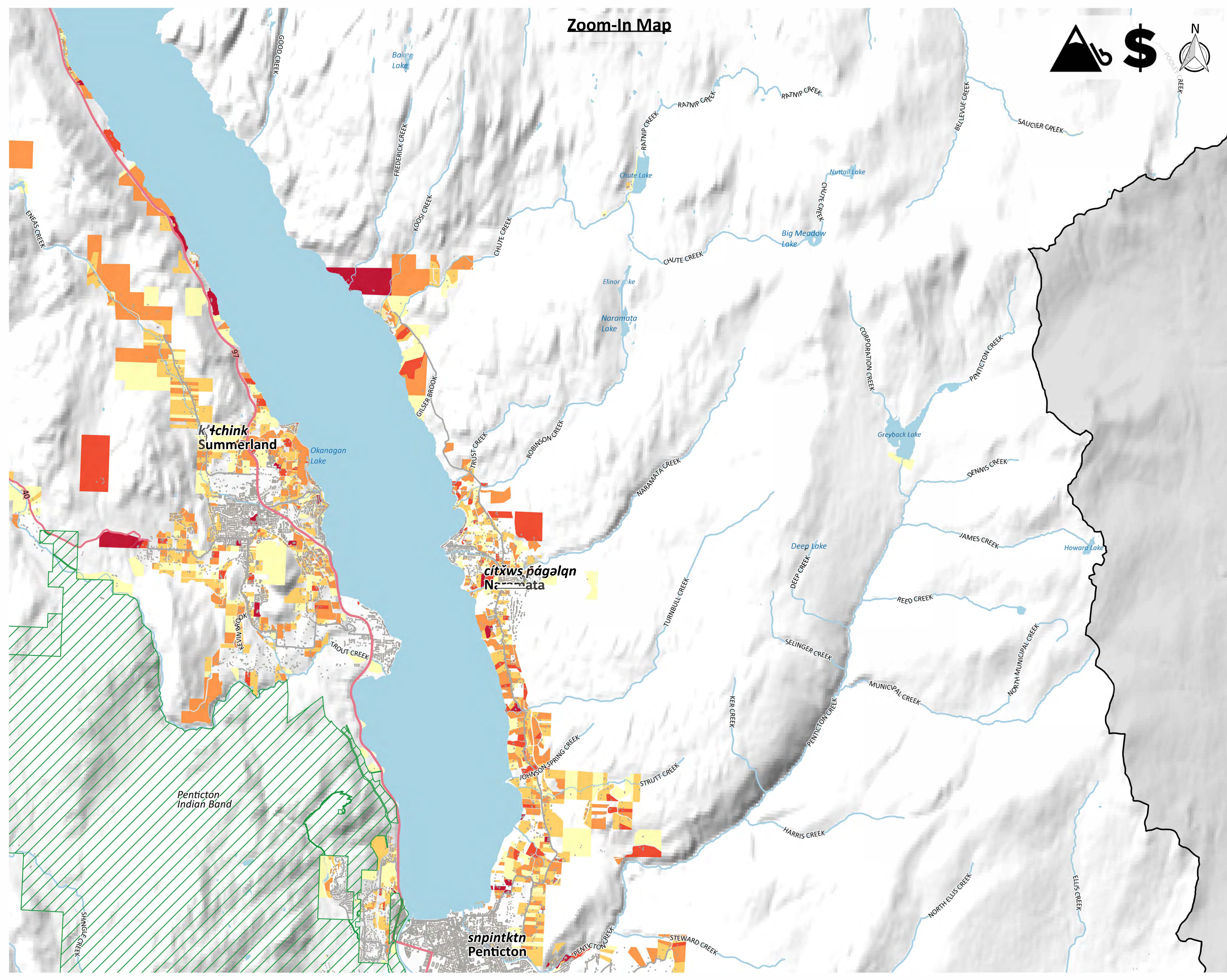
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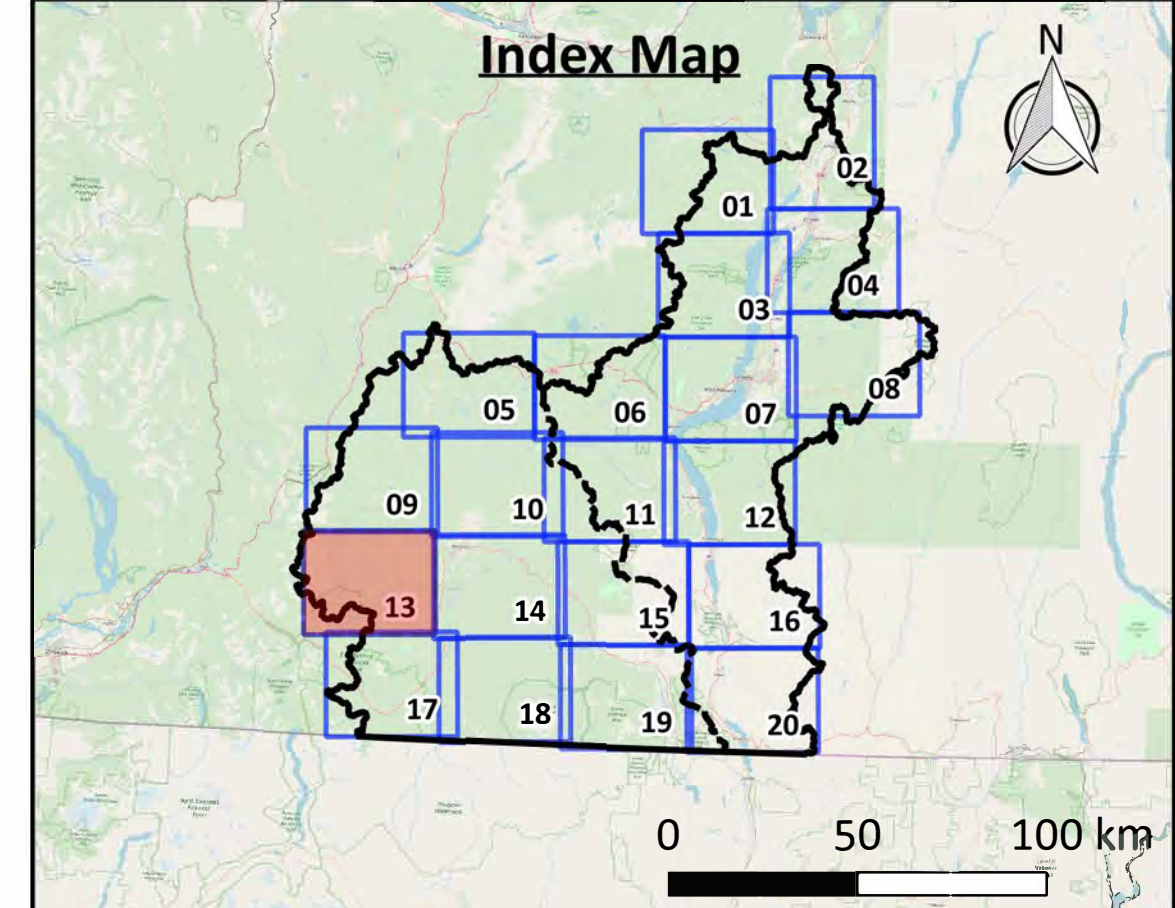
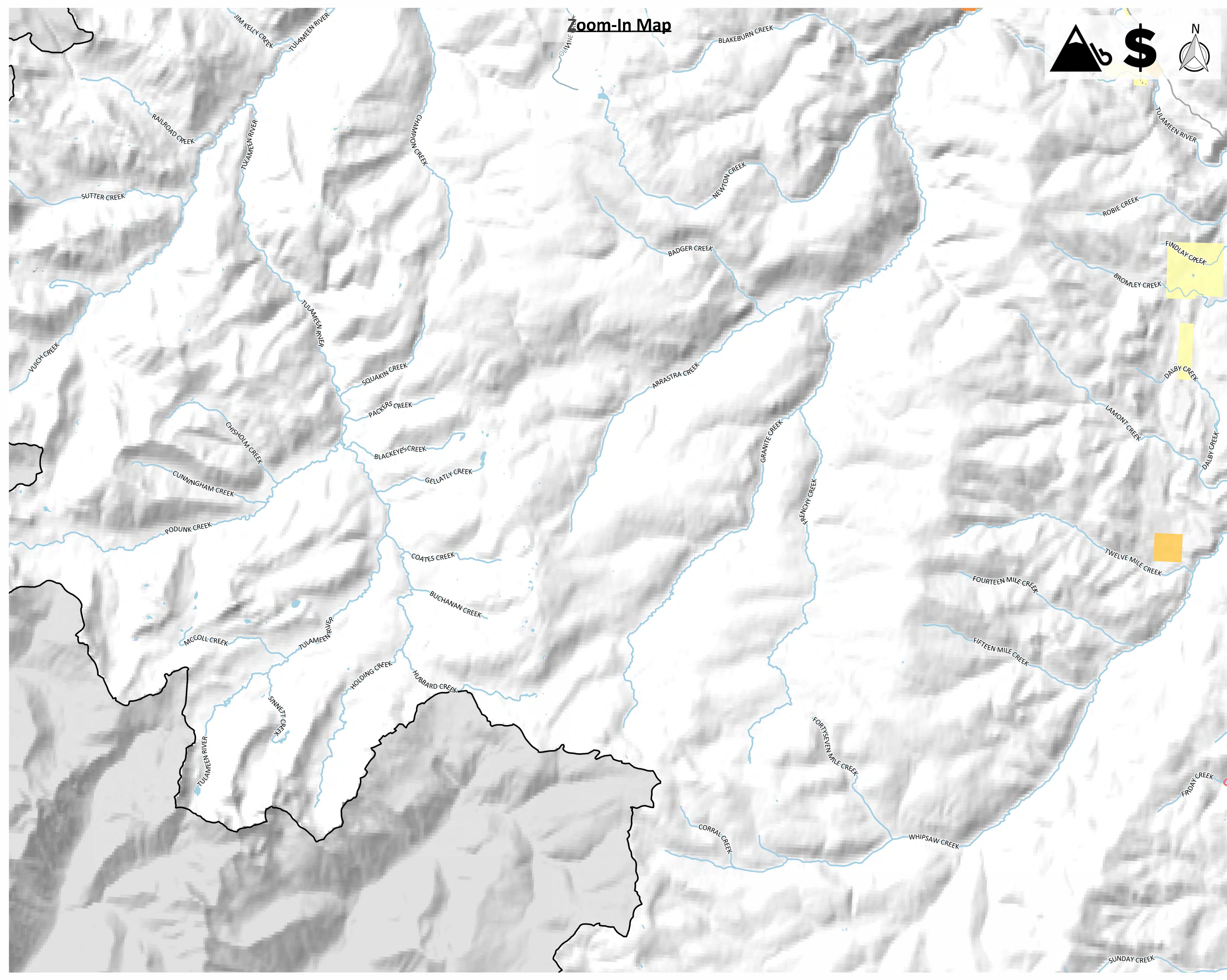
Background	Affected Assets
— Watershed Boundary	Total Land Value
-- Okanagan-Similkameen Boundary	Yellow \$1 - \$250,000
Canada - US Border	Orange \$250,000 - \$500,000
Reserves	Light Orange \$500,000 - \$1,000,000
Lakes	Red \$1,000,000 - \$2,000,000
Watercourses	Dark Red \$2,000,000 +
Highway	
Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
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ANSI D - Map No. EC-D-001-012





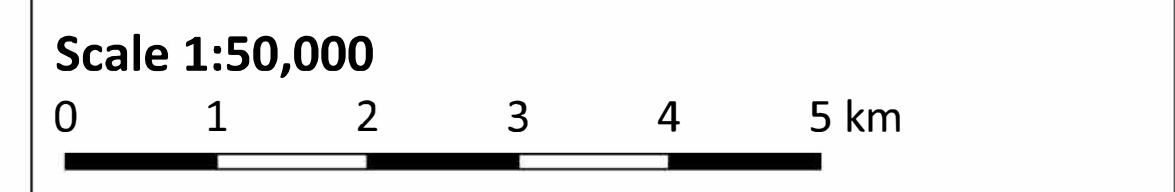
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[Click here to return to Similkameen map](#)

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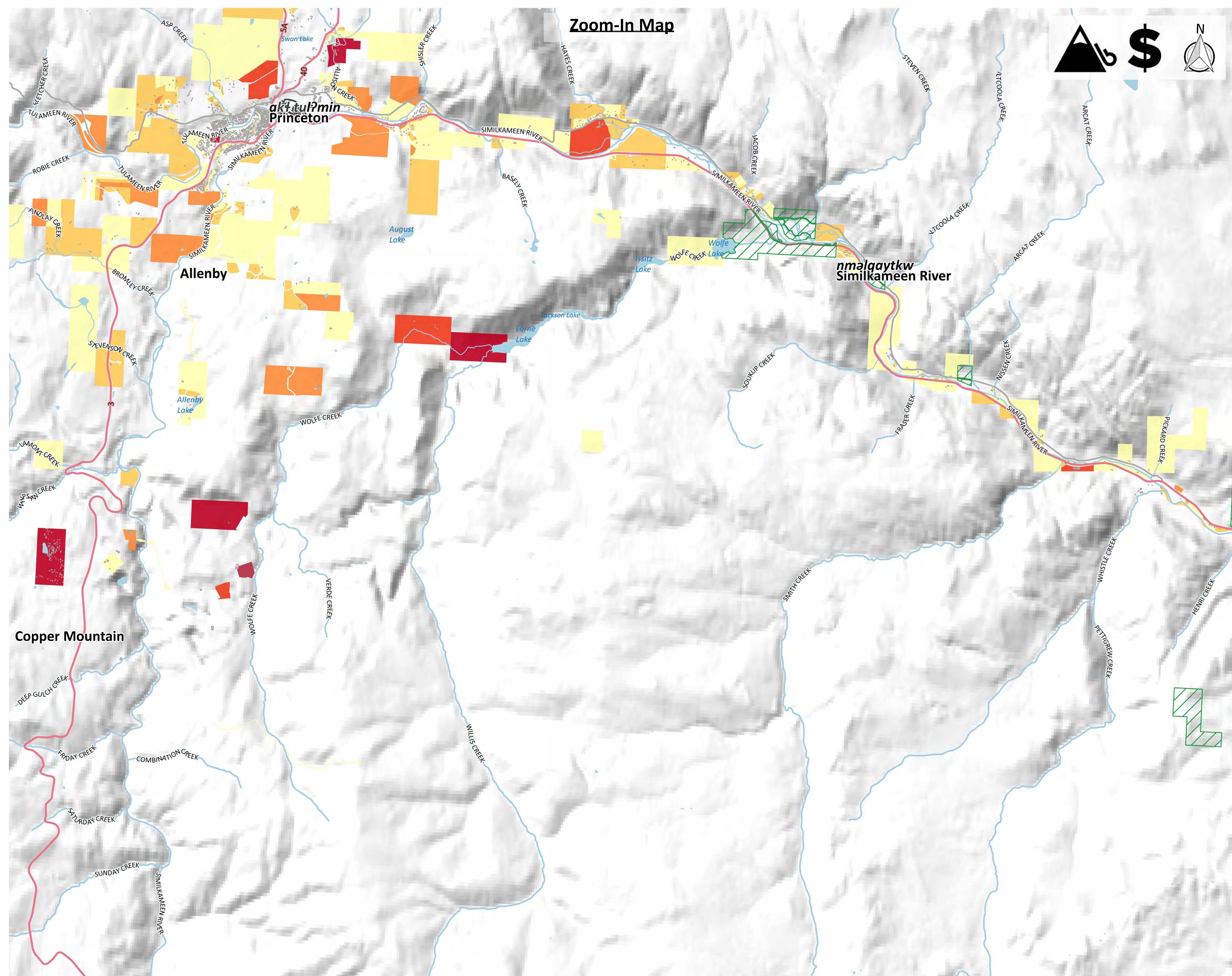


Legend

Watershed Boundary	Affected Assets
Okanagan-Similkameen Boundary	
Canada - US Border	Total Land Value
Reserves	\$1 - \$250,000
Lakes	\$250,000 - \$500,000
Watercourses	\$500,000 - \$1,000,000
Highway	\$1,000,000 - \$2,000,000
Major Road	\$2,000,000 +

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
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Zoom-In Map



ebbwater CONSULTING
THOUGHTFUL FLOOD MANAGEMENT

Palmer Environmental Consulting Group Inc.

Sylix Okanagan Nation Alliance

Index Map

0 50 100 km

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Scale 1:50,000

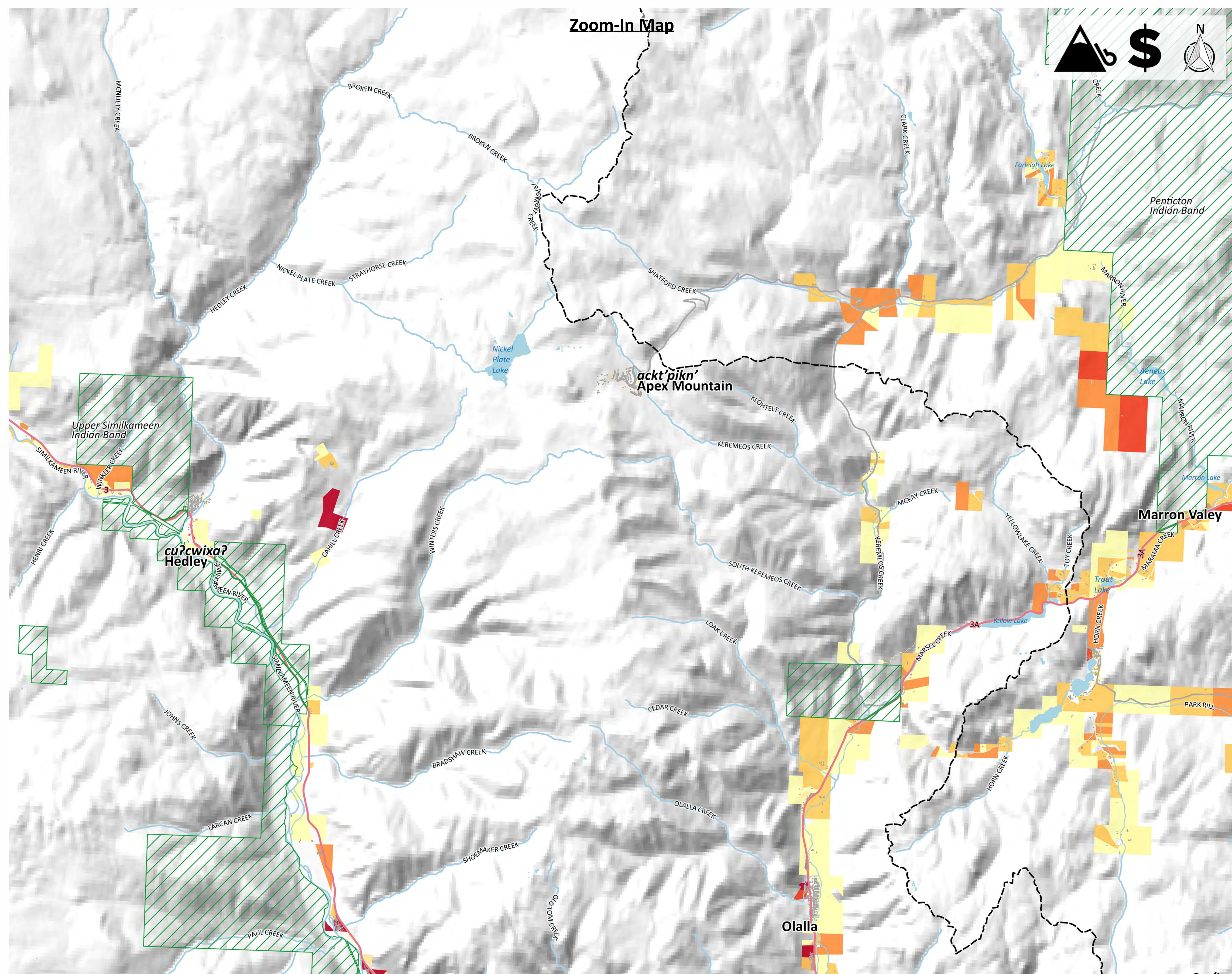
Legend

Background	Affected Assets
— Watershed Boundary	Total Land Value
- - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▨ Reserves	Dark Orange: \$500,000 - \$1,000,000
— Lakes	Red: \$1,000,000 - \$2,000,000
— Watercourses	Dark Red: \$2,000,000 +
— Highway	
— Major Road	

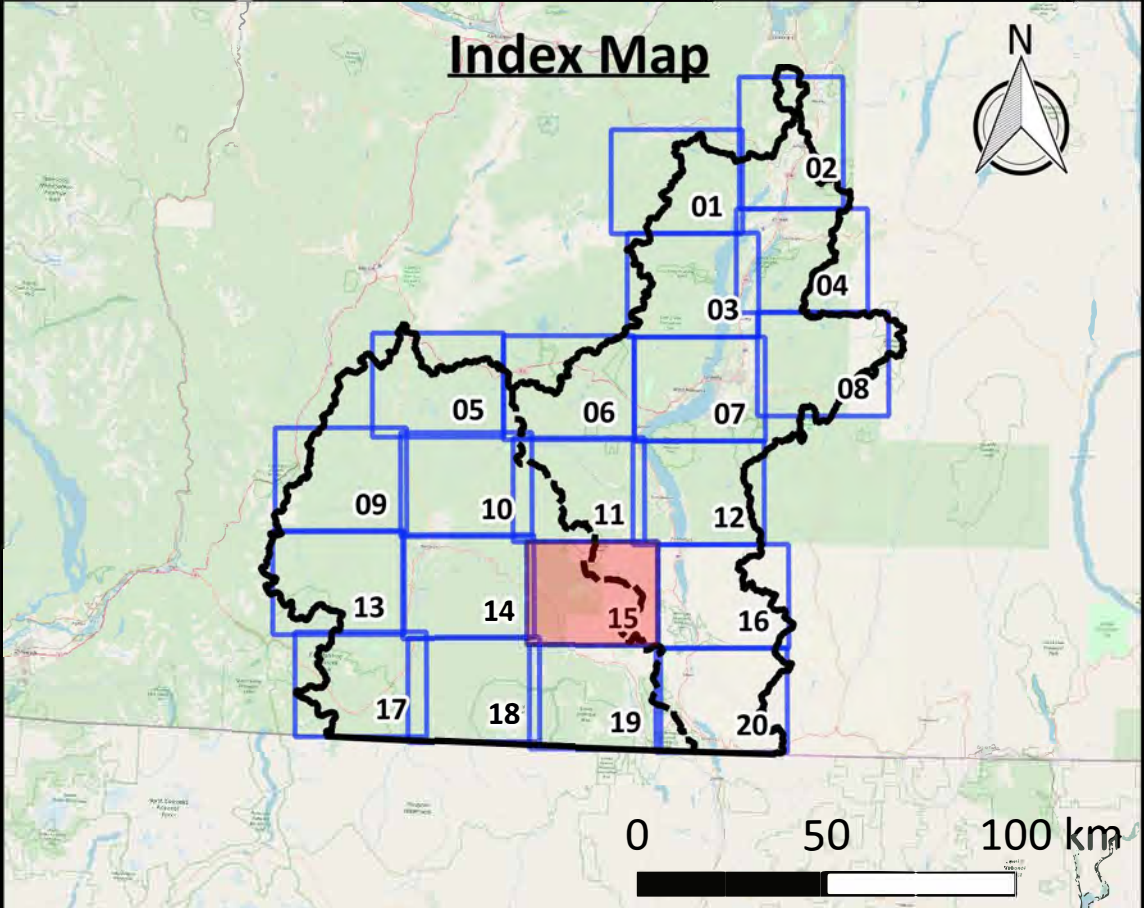
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
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ANSI D - Map No. EC-D-001-014



Zoom-In Map



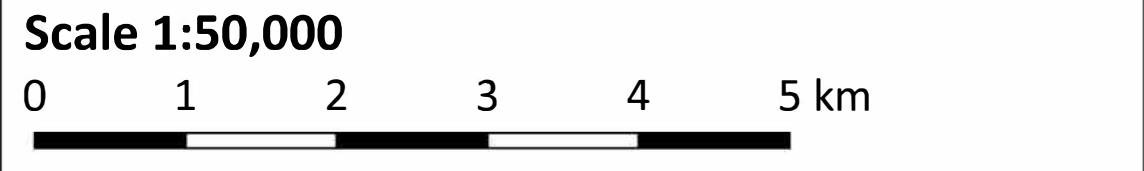
Click above map tile for Zoom-In map
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

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Legend

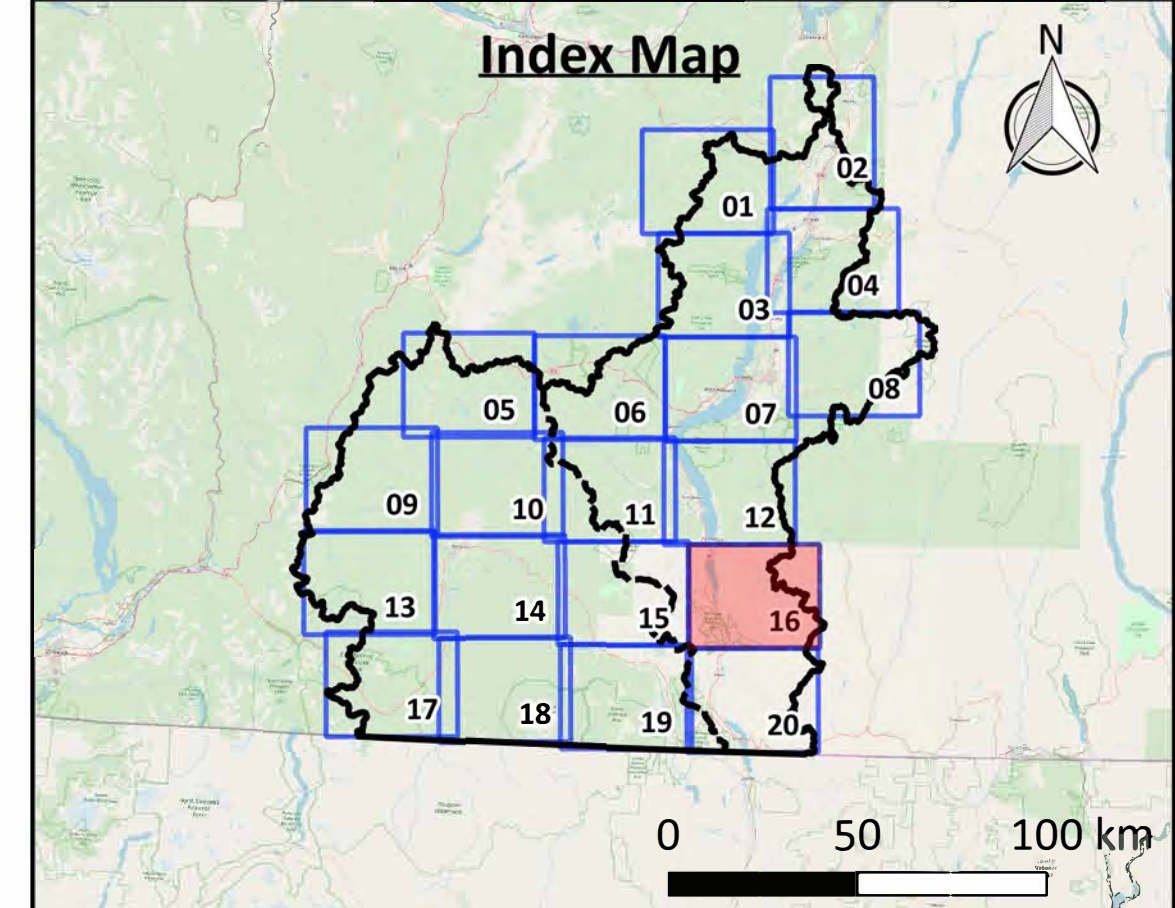
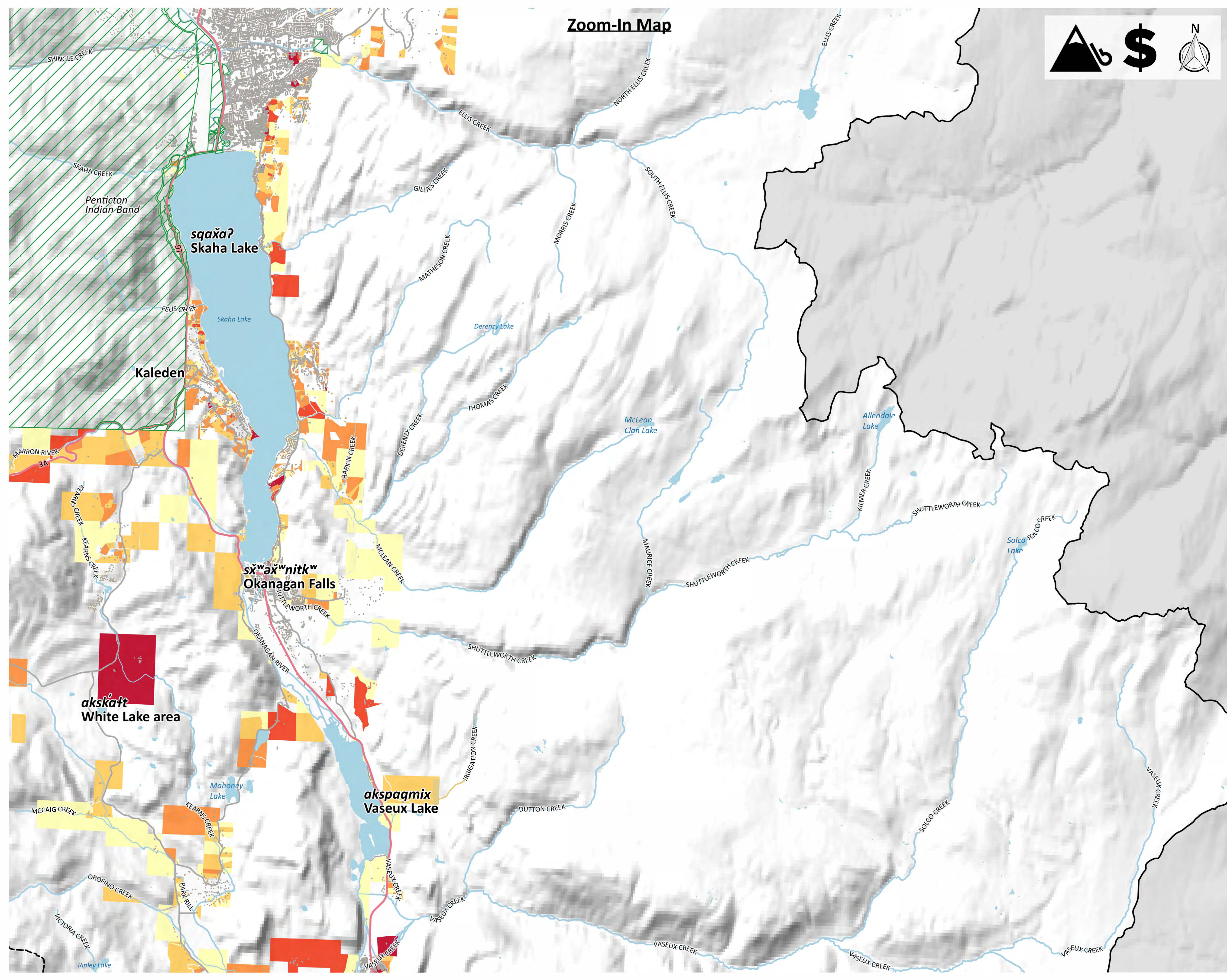
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow \$1 - \$250,000
— Canada - US Border	Orange \$250,000 - \$500,000
▨ Reserves	Red \$500,000 - \$1,000,000
— Lakes	Dark Red \$1,000,000 - \$2,000,000
— Watercourses	Dark Red \$2,000,000 +
— Highway	
— Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 15 of 20

ANSI D - Map No. EC-D-001-015

Zoom-In Map



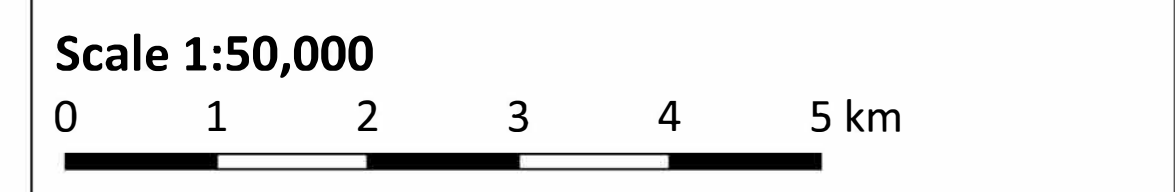
[Click above map tile for Zoom-In map](#)
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

Map Notes

1. Map produced by Ebbwater Consulting Inc.
2. Land values are based on BC Assessment data using land parcels. The data are known to be incomplete, especially on reserve lands. The gap on reserve lands has been addressed by applying average property values to building footprints as a proxy.
3. The land values (exposure) layer was clipped to the debris flow hazard area. The hazard layer is shown in the hazard maps, and was produced by Palmer Environmental Consulting Group Inc. The method used to produce the hazard layer is described in the Quantitative Study.

Data Sources

1. Lakes and Watercourses, Roads and Trails, and Reserves: BC Data Catalogue.
2. Land Values: BC Assessment Data and Building Footprints.
3. Building Footprints: Regional districts, municipalities, WFN and hand digitized using Bing Satellite Imagery.
4. Sylix Place Names: Okanagan Nation Alliance.
5. Base Layer: OpenStreetMap data – openstreetmap.org (© OpenStreetMap contributors; cartography licence CC BY-SA) and hill shade created using CDEM and USGM GMTED2010.



Legend

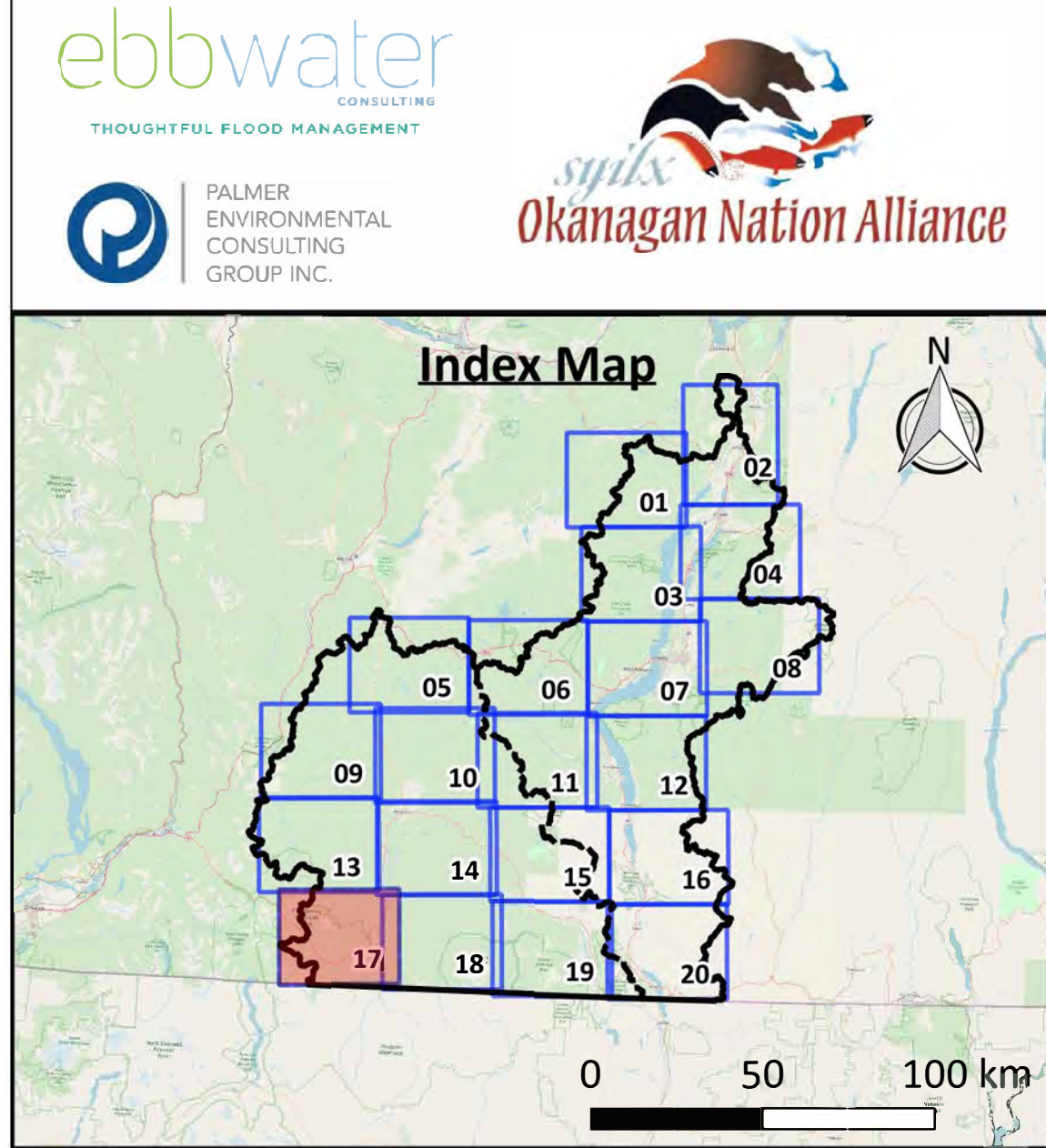
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▨ Reserves	Red-Orange: \$500,000 - \$1,000,000
▨ Lakes	Red: \$1,000,000 - \$2,000,000
▨ Watercourses	Dark Red: \$2,000,000 +
▨ Highway	
▨ Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 16 of 20

ANSI D - Map No. EC-D-001-016

Zoom-In Map



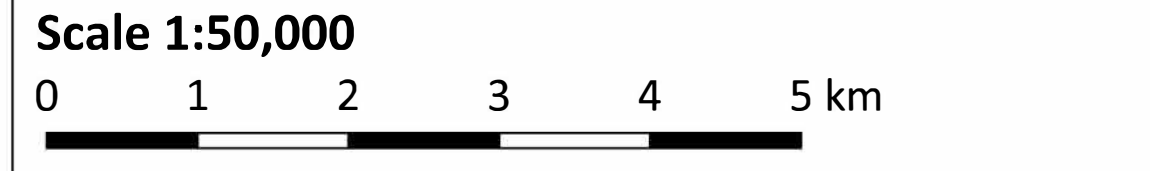
[Click above map tile for Zoom-In map](#)
[Click here to return to Project Area map](#)
[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

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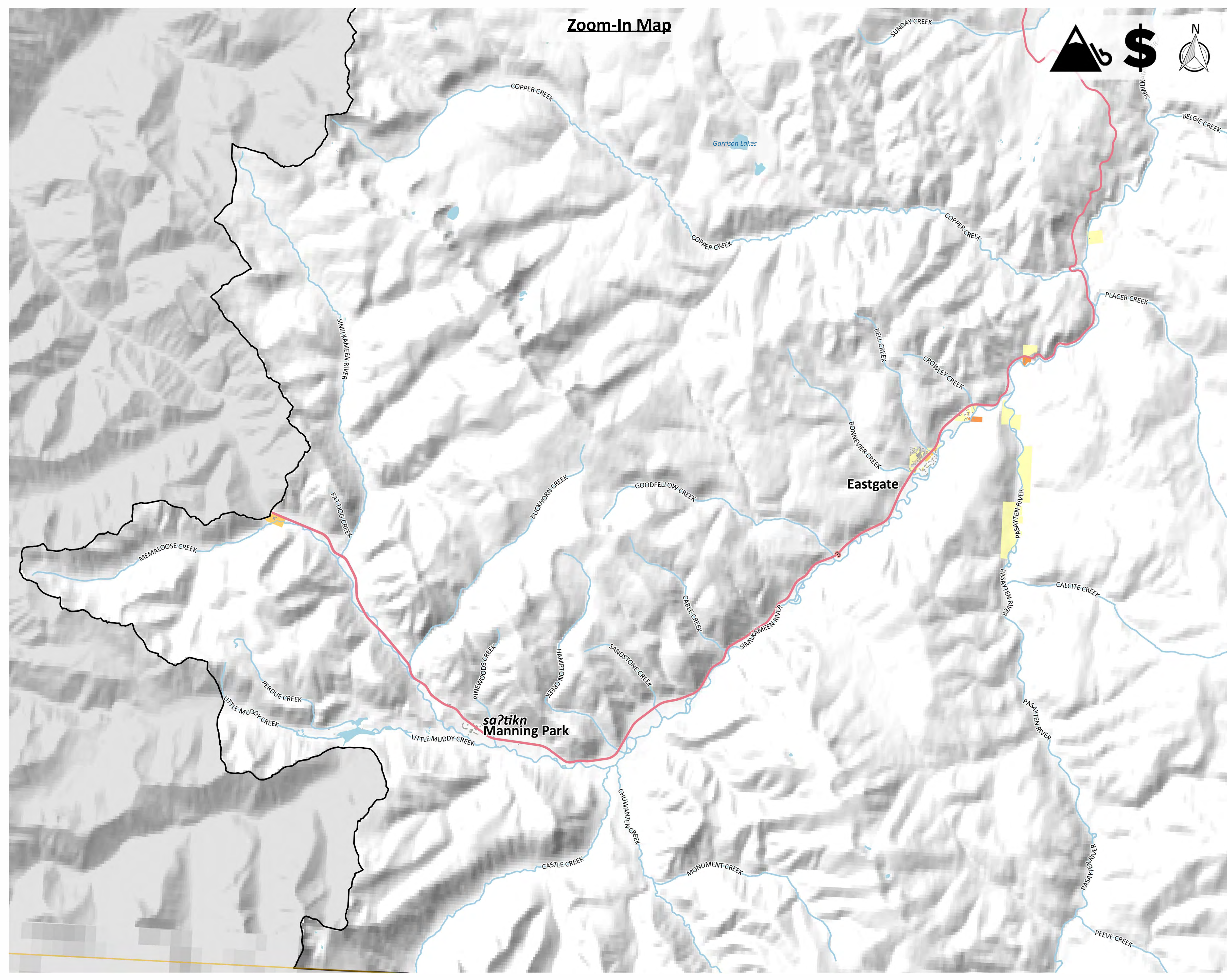
Legend

Background		Affected Assets	
—	Watershed Boundary	Yellow	\$1 - \$250,000
- - -	Okanagan-Similkameen Boundary	Orange	\$250,000 - \$500,000
—	Canada - US Border	Red	\$500,000 - \$1,000,000
▨	Reserves	Dark Red	\$1,000,000 - \$2,000,000
—	Lakes	Dark Red	\$2,000,000 +
—	Watercourses		
—	Highway		
—	Major Road		

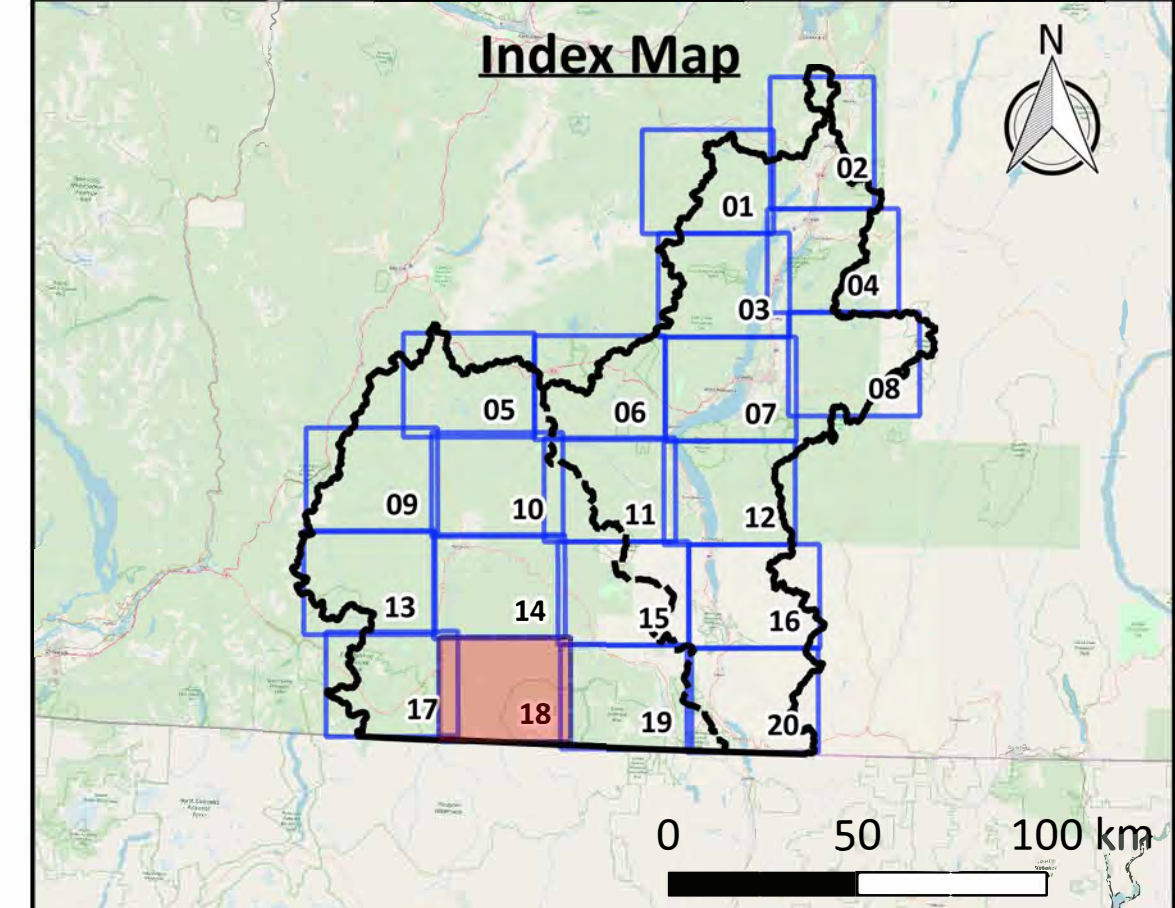
Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 17 of 20

ANSI D - Map No. EC-D-001-017



Zoom-In Map



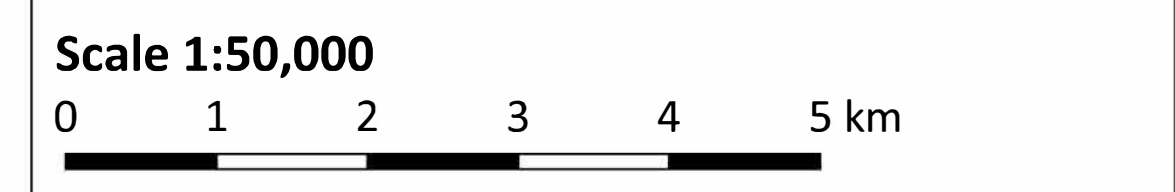
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[Click here to return to Okanagan map](#)
[Click here to return to Similkameen map](#)

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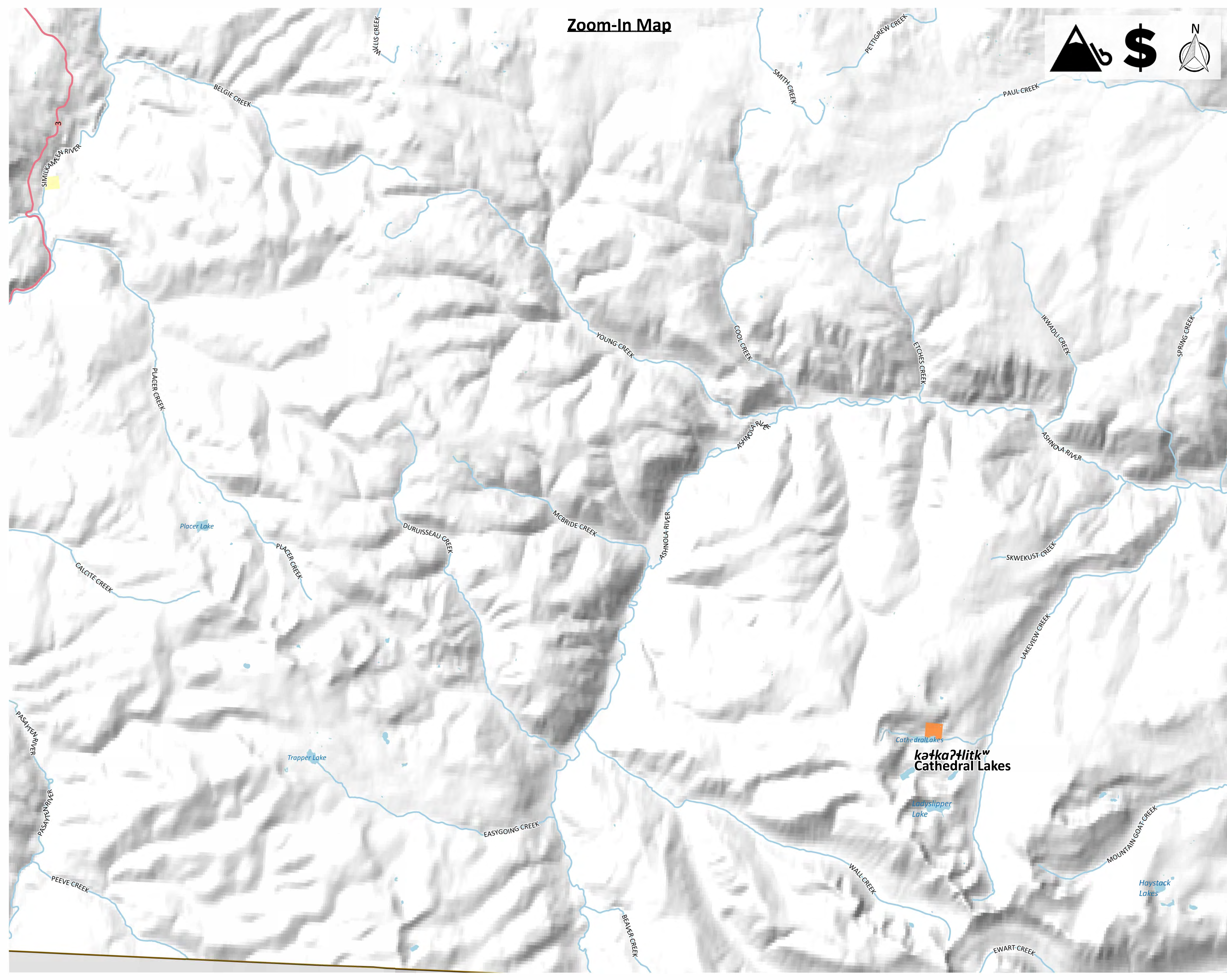
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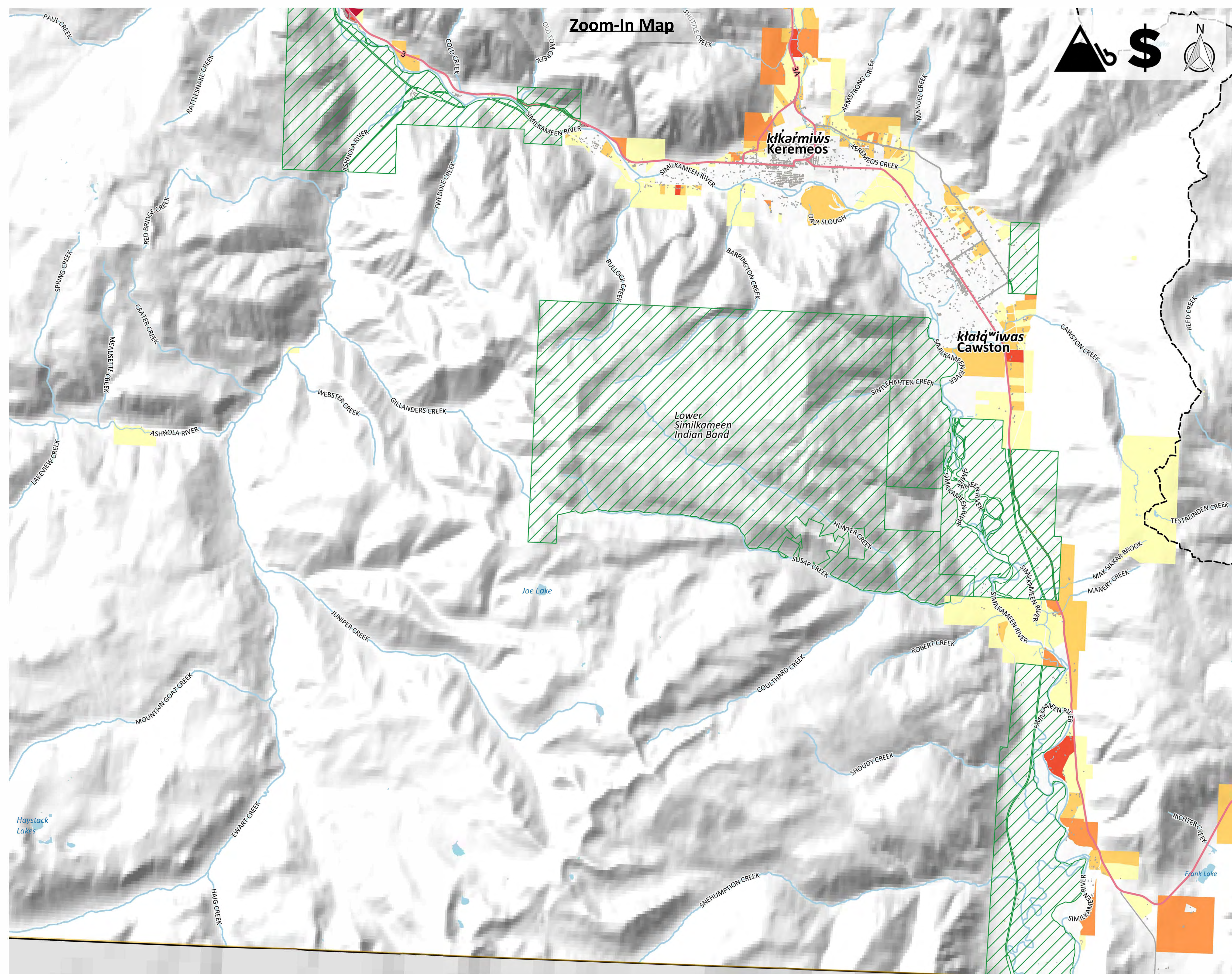
Background	Affected Assets
— Watershed Boundary	Total Land Value
- - - Okanagan-Similkameen Boundary	Yellow: \$1 - \$250,000
— Canada - US Border	Orange: \$250,000 - \$500,000
▭ Reserves	Red-Orange: \$500,000 - \$1,000,000
▭ Lakes	Red: \$1,000,000 - \$2,000,000
▭ Watercourses	Dark Red: \$2,000,000 +
▬ Highway	
▬ Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

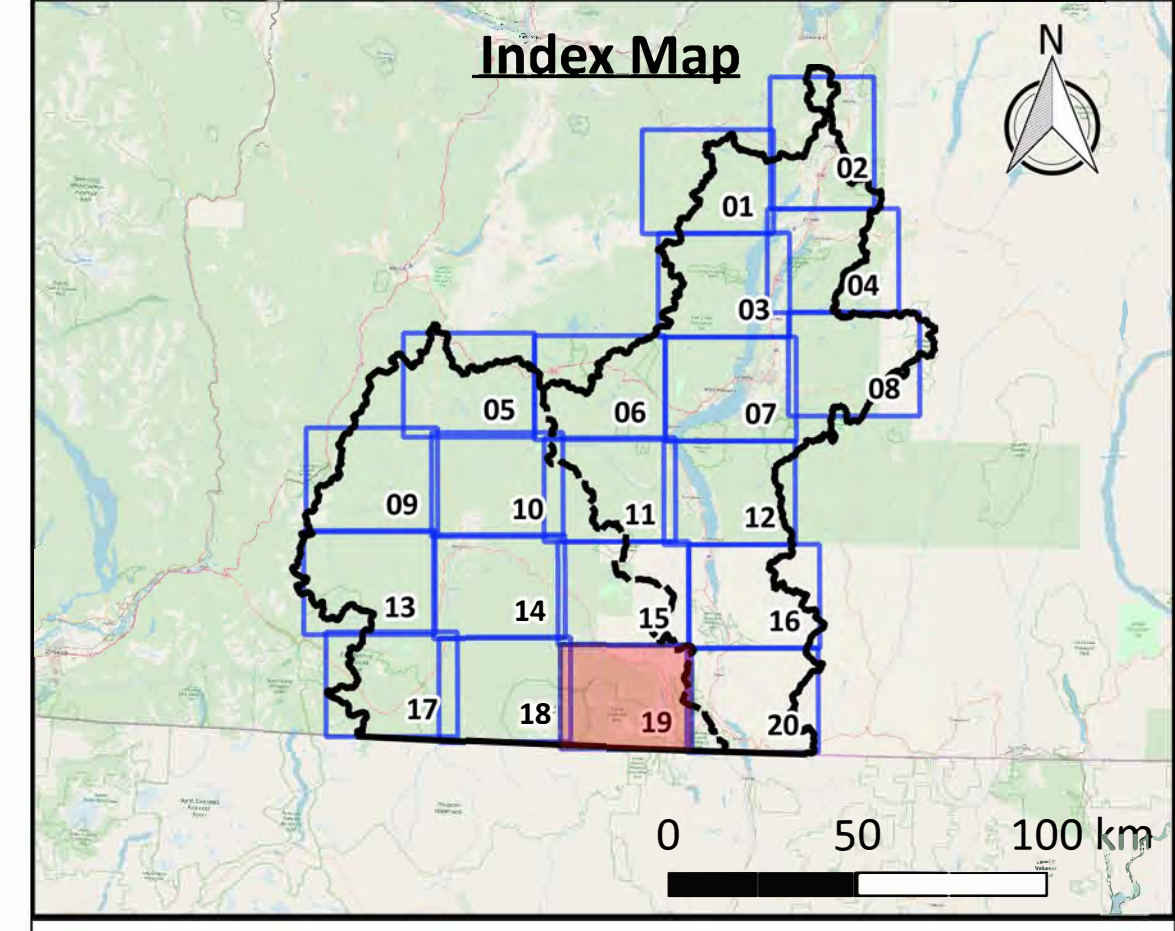
Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 18 of 20

ANSI D - Map No. EC-D-001-018





Zoom-In Map



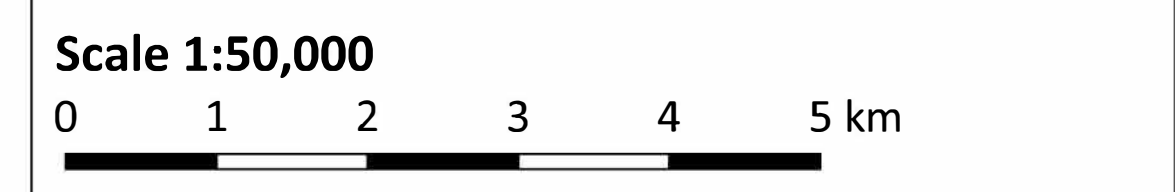
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[Click here to return to Okanagan map](#)
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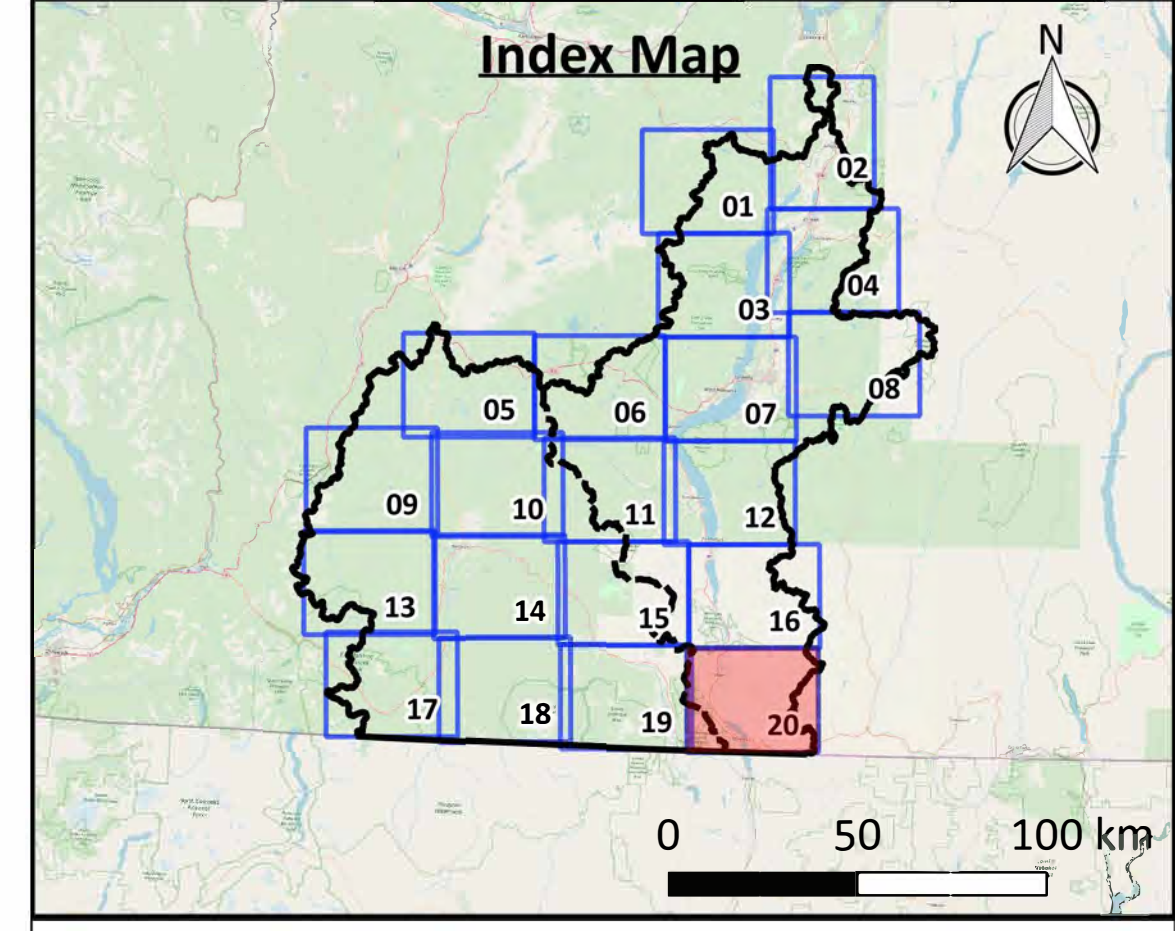
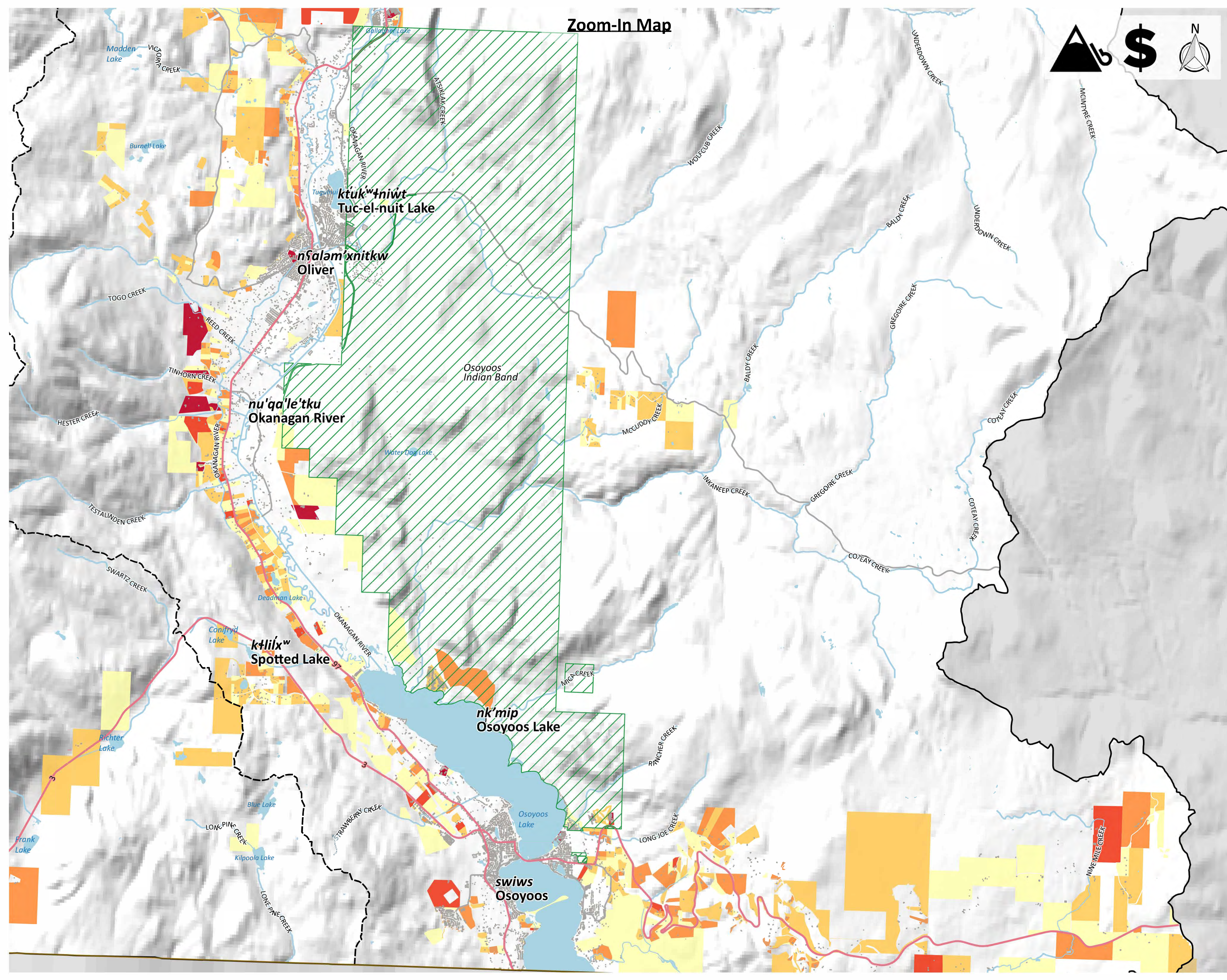


Legend

Background	Affected Assets
— Watershed Boundary	Total Land Value
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— Canada - US Border	Orange: \$250,000 - \$500,000
▨ Reserves	Red-Orange: \$500,000 - \$1,000,000
— Lakes	Red: \$1,000,000 - \$2,000,000
— Watercourses	Dark Red: \$2,000,000 +
— Highway	
— Major Road	

Date: 31 December 2019
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Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
Map Tile 19 of 20



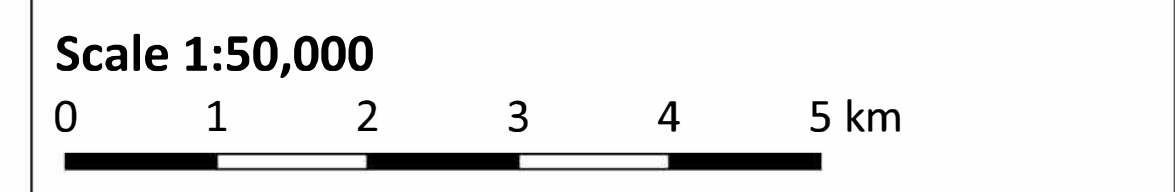
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Legend

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— Watershed Boundary	Total Land Value
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— Canada - US Border	Orange \$250,000 - \$500,000
▨ Reserves	Red-Orange \$500,000 - \$1,000,000
— Lakes	Red \$1,000,000 - \$2,000,000
— Watercourses	Dark Red \$2,000,000 +
— Highway	
— Major Road	

Date: 31 December 2019
Produced by: Ebbwater Consulting Inc.

Sylix (Okanagan) Flood and Debris Flow Risk Assessment Project
Debris Flow - Economy
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