



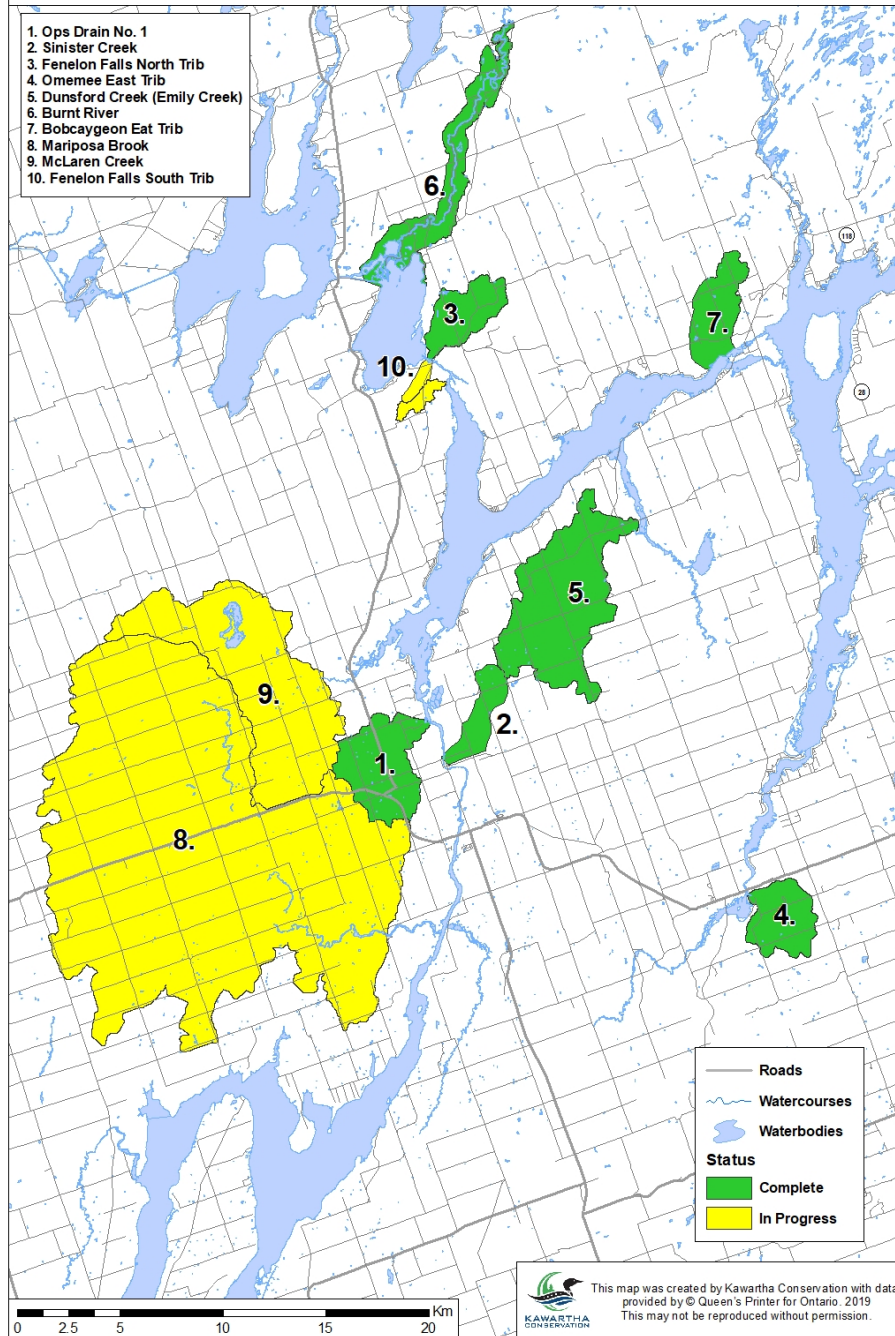
# KAWARTHA CONSERVATION

Discover • Protect • Restore



# Flood Plain Mapping Project Areas

1. Ops Drain No. 1
2. Sinister Creek
3. Fenelon Falls North Trib
4. Omeme East Trib
5. Dunsford Creek (Emily Creek)
6. Burnt River
7. Bobcaygeon East Trib
8. Mariposa Brook
9. McLaren Creek
10. Fenelon Falls South Trib

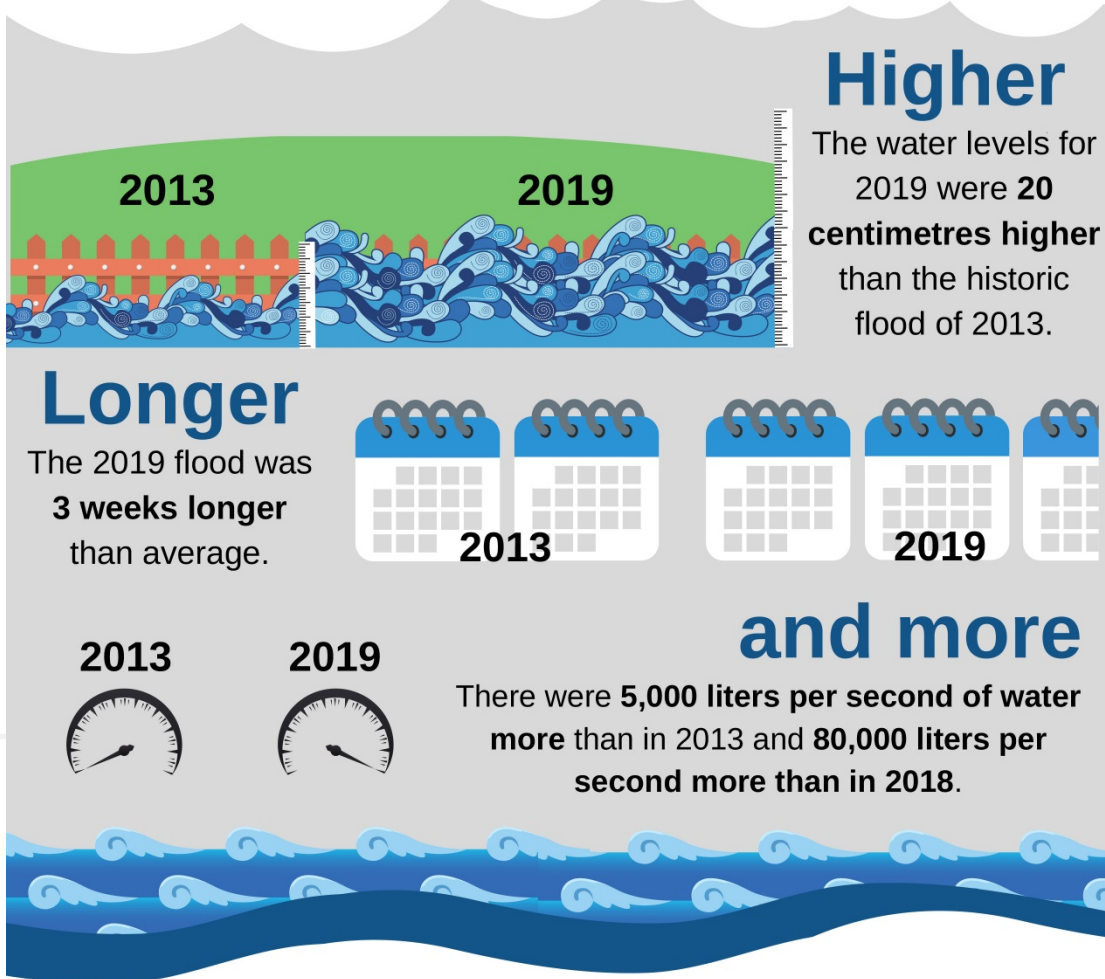


This map was created by Kawartha Conservation with data provided by © Queen's Printer for Ontario, 2019. This may not be reproduced without permission.



# Burnt River Flood2019

This 2019 flooding was **higher, longer  
and contained more water** than any  
other flood in this municipality's history.



The floodplain mapping project completed by Kawartha Conservation has shown that potential discharge and flow rate for the Burnt River could be double of this year's historic high event.

Data supplied by Kawartha Conservation.

For more information, contact  
[kawarthaconservation.com](http://kawarthaconservation.com)





# Burnt River 2013, 2016, & 2019 Flood Event



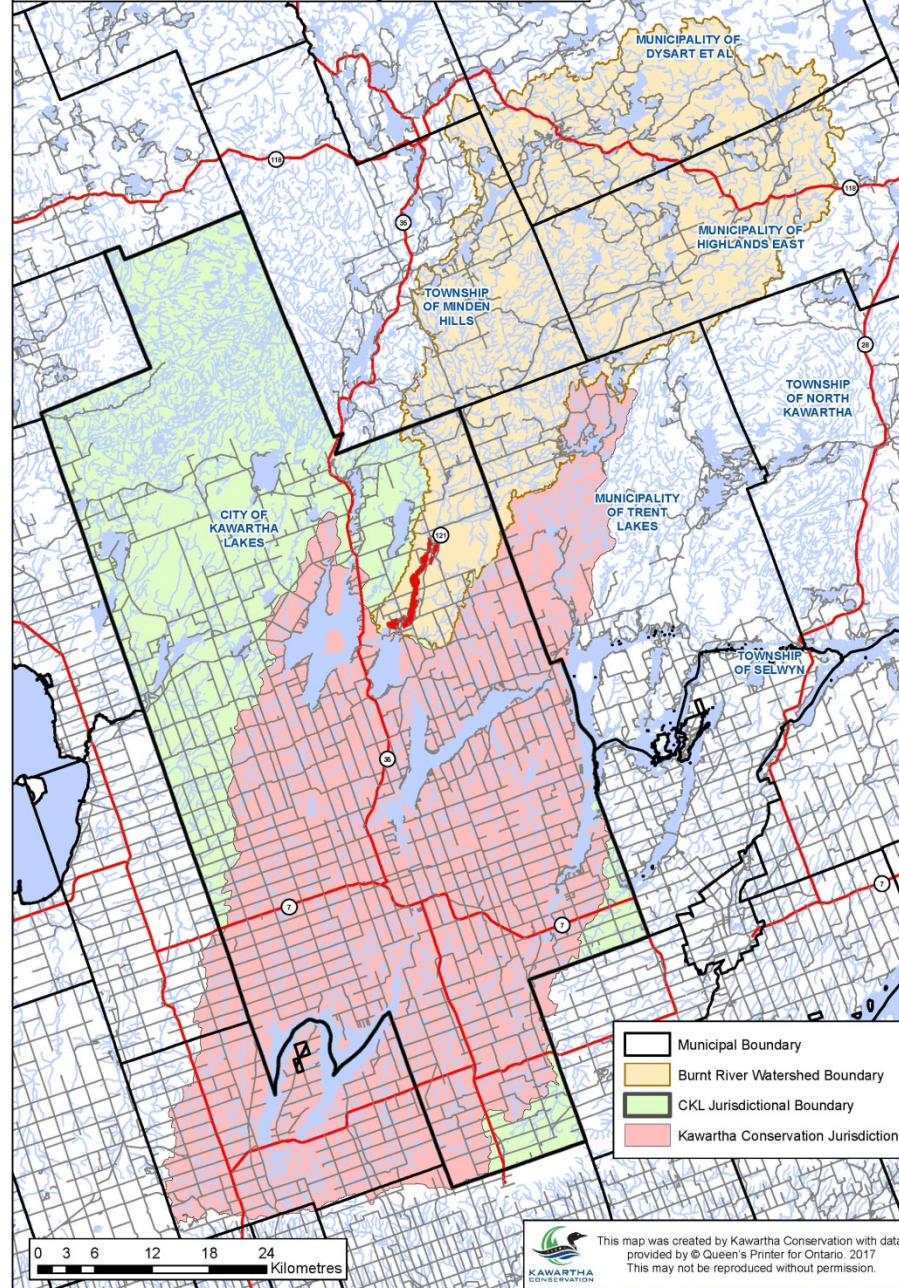


# Burnt River 2013, 2016, & 2019 Flood Event





# Burnt River Watershed and CKL and Kawartha Conservation Jurisdiction Comparison







Produced by Kawartha Conservation  
with data supplied under license by members  
of the Ontario Data Exchange,  
Ontario Ministry of Natural Resources.  
© Queen's Printer for Ontario, 2019.

## Federal Funding

- Burnt River Flood Mapping Study was the first project submitted for federal funding under the National Disaster Mitigation Program provided by the federal government
- We were successful in our application and received \$66,500 which was matched by the City of Kawartha Lakes
- We have since been successful in receiving NDMP funding for three of our other projects which include: Mariposa Brook, Fenelon Falls South and McLarens Creek

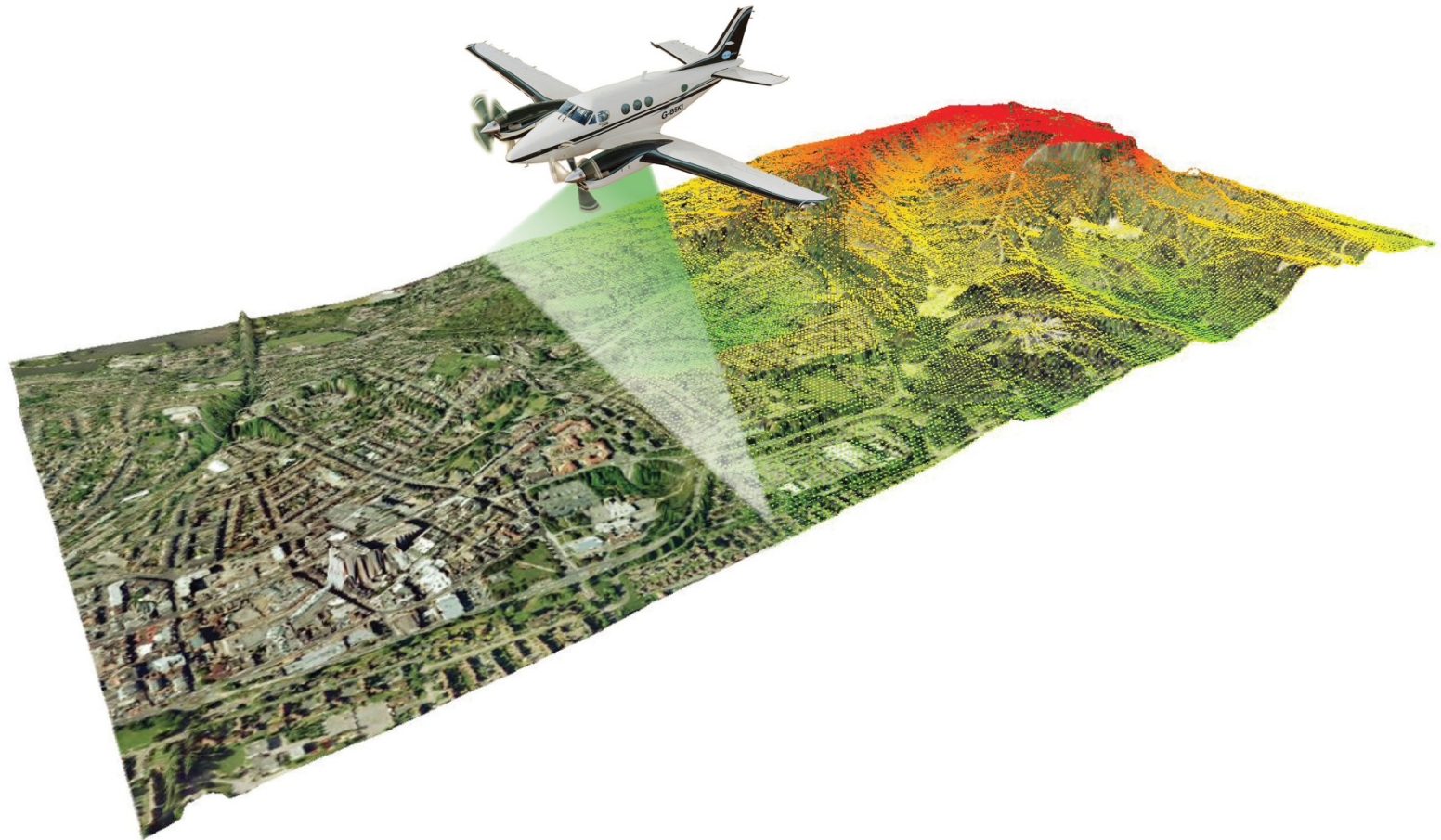




# Flood Plain Mapping Study Details

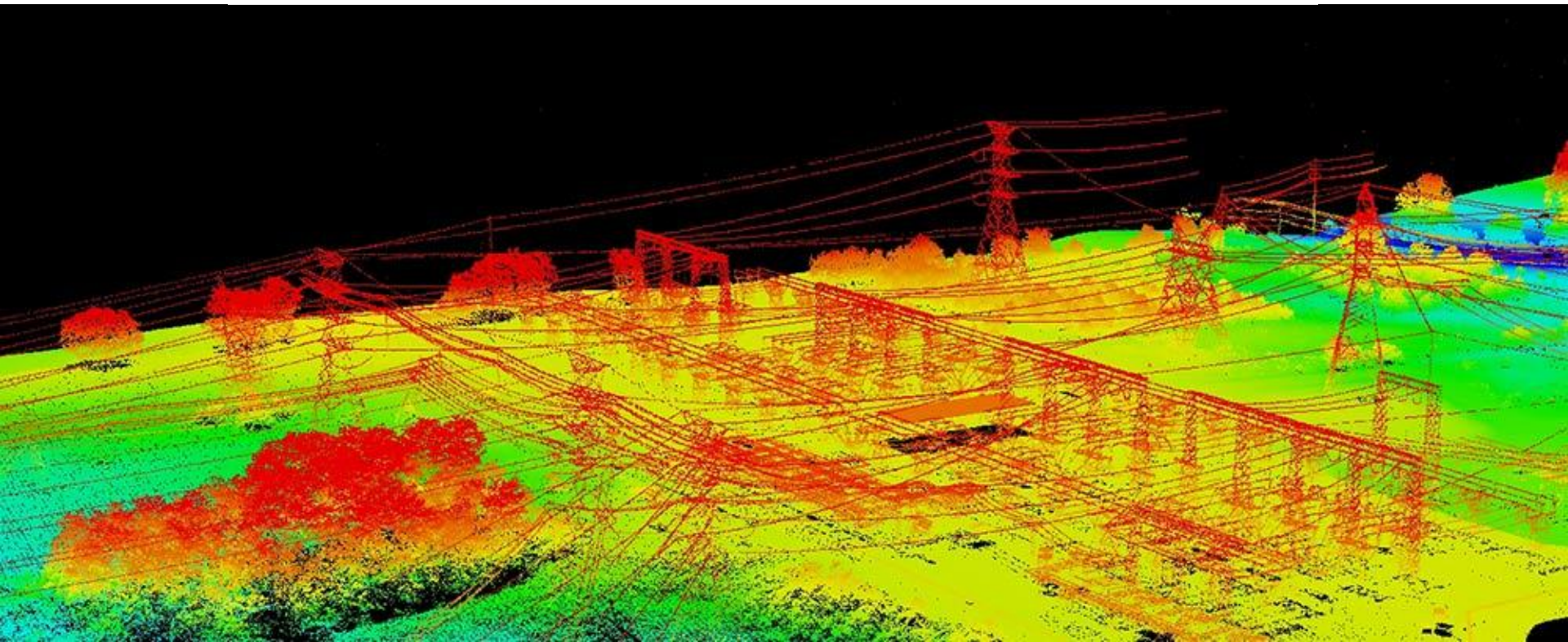
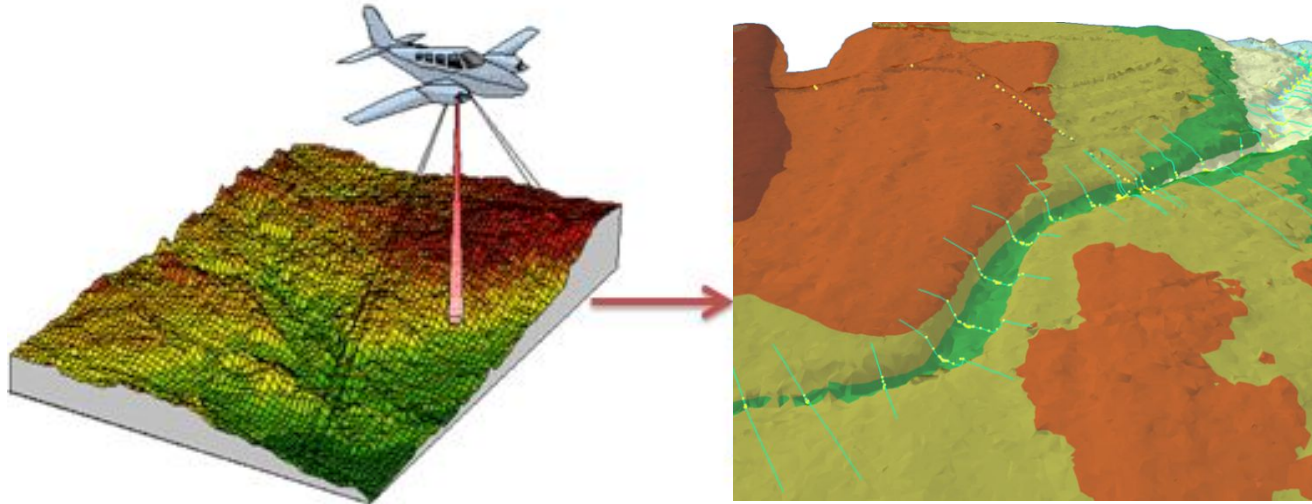
- The regulatory flood line is the greater of the Regional Storm or 1:100 yr event
- Technical Committee created Quality Assurance (QA) and Quality Control (QC) standards for all Kawartha Conservation floodplain studies
- Ganaraska Region Conservation Authority (GRCA) responsible for QA/QC to ensure data meets provincial standards
- **All steps have been peer-reviewed**
  - Digital maps and air photos
  - Survey collection and integration with mapping
  - Hydrology computer model
  - Hydraulic computer model
  - Technical Report and Appendices

# LiDAR (Light Detection & Ranging) Technologies





# Example of LiDAR Mapping Output Data





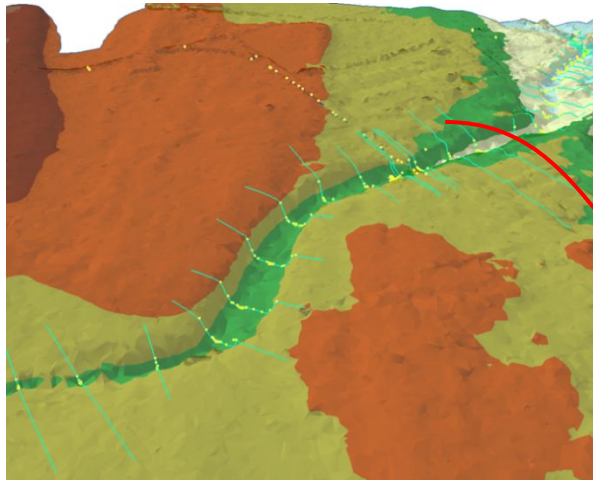
# In Field Survey Work and LiDAR Ground Truthing



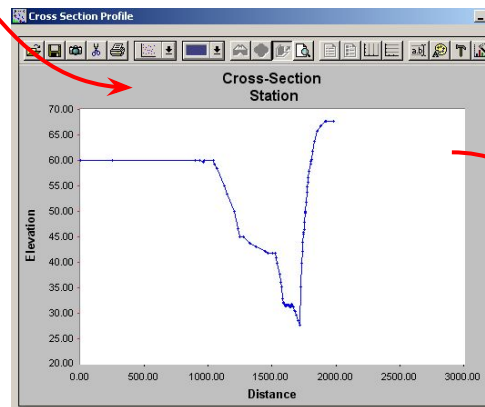




# Hydraulic Computer Modelling



Output surface from LiDAR



Computer Model Cross-Section



Model Output – Flood Plain Mapping



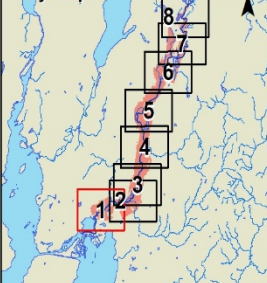


# Burnt River Flood Plain Map City of Kawartha Lakes Printed: May 2019

## Legend

- Burnt River
- Cross Section
- 1.0 m LIDAR Contours
- 1.0 m SCOP Contours
- Draft Flood Plain
- LIDAR Boundary

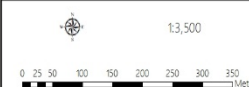
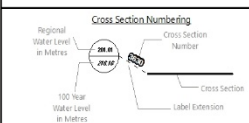
## Key Map



## Notes:

1. LIDAR Data Collection and Rangefinder survey data collected November 20th, 21st, and 22nd, 2012 by Geo-Photo (2012).
2. Contour generated by Kawartha Conservation GIS staff using LIDAR and GEMS 3.000 data.
3. Field Survey of structures by Kawartha Conservation, using RTK GPS.
4. Contour generated by Kawartha Conservation GIS staff using LIDAR and GEMS 3.000 data.
5. The flood plain area was generated using the DEM derived from LIDAR by Kawartha Conservation GIS department.
6. Flood plain modeling was prepared by Kawartha Conservation's engineering department.
7. Map prepared for use in conjunction with the Flood Plain Mapping Study Burnt River, 2019.

REVISIONS			
No.	Description	By	Date
1	Burnt River Flood Plain Map	NP	MAY 2019



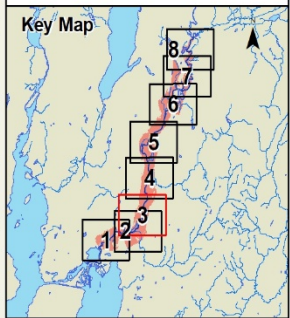






# Burnt River Flood Plain Map City of Kawartha Lakes Printed: May 2019

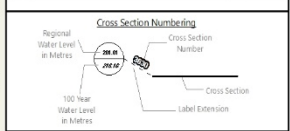
- Legend**
- Burnt River
  - Cross Section
  - 1.0 m LIDAR Contours
  - 1.0 m SCOP Contours
  - Draft Flood Plain
  - LIDAR Boundary



**Notes:**

- 1) Draft Light Detection and Ranging survey data collected November 20th, 21st, and 22nd, 2018. See Project 150510-18.
- 2) Draft Survey of the Burnt River by Kawartha Lakes Conservation, along with 2018 and 2019 data.
- 3) Draft Survey of the Burnt River by Kawartha Lakes Conservation, along with 2018 and 2019 data.
- 4) Draft Survey of the Burnt River by Kawartha Lakes Conservation, along with 2018 and 2019 data.
- 5) Draft Survey of the Burnt River by Kawartha Lakes Conservation, along with 2018 and 2019 data.
- 6) Draft Survey of the Burnt River by Kawartha Lakes Conservation, along with 2018 and 2019 data.
- 7) The Flood Plain map was created using the DEM derived from LIDAR data by Kawartha Conservation.
- 8) Flood plain modeling was prepared by Kawartha Conservation's engineering department. Your cooperation is requested for any mapping prepared by Kawartha Conservation's department.
- 9) The map is prepared for use in conjunction with the Draft Flood Plain Mapping Study Burnt River Creek, 2018.

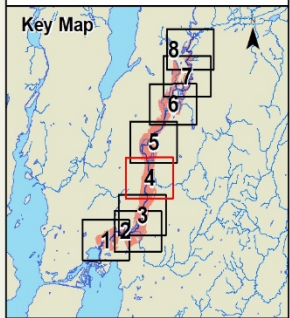
REVISIONS			
No.	Description	By	Date
1	Burnt River Flood Plain Map	TJP	MAY 2019





# Burnt River Flood Plain Map City of Kawartha Lakes Printed: May 2019

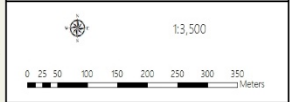
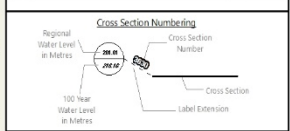
- Legend**
- Burnt River
  - Cross Section
  - 1.0 m LIDAR Contours
  - 1.0 m SCOP Contours
  - Draft Flood Plain
  - LIDAR Boundary



**Notes:**

- 1) Data from the Burnt River and Rangley survey data of October November 2018, 2019, and 2020.
- 2) Data from the Burnt River and Rangley survey data of October November 2018, 2019, and 2020.
- 3) Data from the Burnt River and Rangley survey data of October November 2018, 2019, and 2020.
- 4) Data from the Burnt River and Rangley survey data of October November 2018, 2019, and 2020.
- 5) Data from the Burnt River and Rangley survey data of October November 2018, 2019, and 2020.
- 6) Data from the Burnt River and Rangley survey data of October November 2018, 2019, and 2020.
- 7) Data from the Burnt River and Rangley survey data of October November 2018, 2019, and 2020.
- 8) Data from the Burnt River and Rangley survey data of October November 2018, 2019, and 2020.

REVISIONS			
No.	Description	By	Date
1	Burnt River Flood Plain Map	TAP	MAY 2019



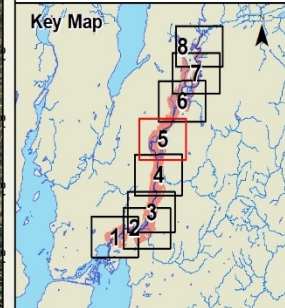


# Burnt River Flood Plain Map City of Kawartha Lakes Printed: May 2019

## Legend

- Burnt River
- Cross Section
- 1.0 m LIDAR Contours
- 1.0 m SCOP Contours
- Draft Flood Plain
- LIDAR Boundary

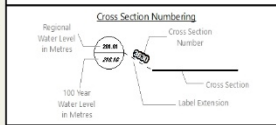
## Key Map



## Notes:

1. LIDAR data was collected and processed by the City of Kawartha Lakes in 2018.
2. LIDAR data was collected by the City of Kawartha Lakes in 2018.
3. Field Survey of structures by Kawartha Conservation, using RTK GPS.
4. Field Survey of structures by Kawartha Conservation, using RTK GPS.
5. The Flood inundation area was estimated using the DEM derived from LIDAR by Kawartha Conservation.
6. Flood plain including was created by Kawartha Conservation's engineering department.
7. The map was prepared for use in conjunction with the Flood Plain Mapping Study Report, 2018.

No.	Description	By	Date
1	Burnt River Flood Plain Map	NP	May 2019

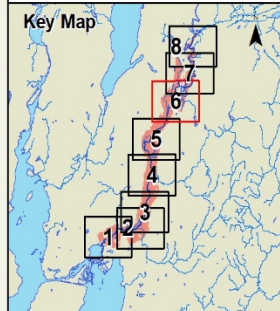




# Burnt River Flood Plain Map City of Kawartha Lakes Printed: May 2019

**Legend**

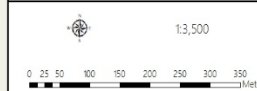
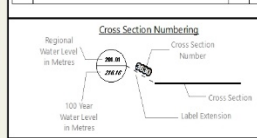
- Burnt River
- Cross Section
- 1.0 m LIDAR Contours
- 1.0 m SCOP Contours
- Draft Flood Plain
- LIDAR Boundary



**Notes:**

1. LIDAR data was collected by the City of Kawartha Lakes in 2018.
2. LIDAR data was collected by the City of Kawartha Lakes in 2018.
3. LIDAR data was collected by the City of Kawartha Lakes in 2018.
4. LIDAR data was collected by the City of Kawartha Lakes in 2018.
5. LIDAR data was collected by the City of Kawartha Lakes in 2018.
6. LIDAR data was collected by the City of Kawartha Lakes in 2018.
7. LIDAR data was collected by the City of Kawartha Lakes in 2018.
8. LIDAR data was collected by the City of Kawartha Lakes in 2018.

REVISIONS			
No.	Description	By	Date
1	Burnt River Flood Plain Map	MP	MAY 2019



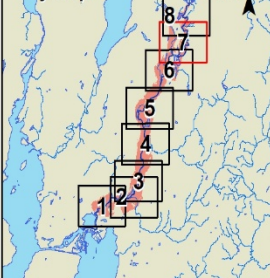


# Burnt River Flood Plain Map City of Kawartha Lakes Printed: May 2019

## Legend

- Burnt River
- Cross Section
- 1.0 m LIDAR Contours
- 1.0 m SCOP Contours
- Draft Flood Plain
- LIDAR Boundary

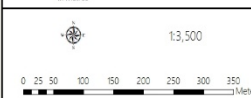
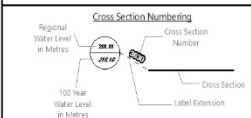
## Key Map



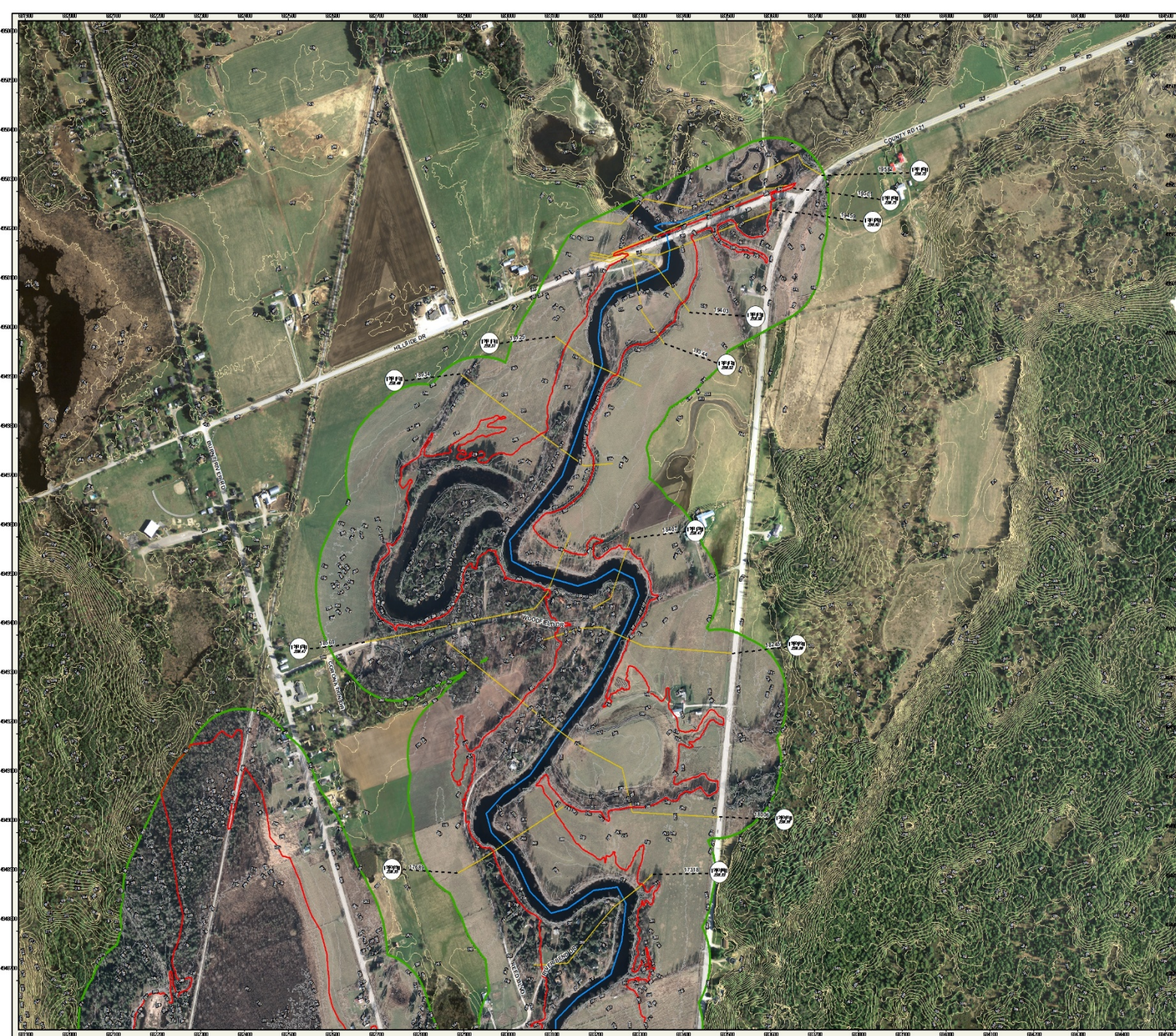
## Notes:

- 1) LIDAR data provided by Kawartha Conservation and City of Kawartha Lakes, dated November 2018, for the Burnt River.
- 2) LIDAR data provided by Kawartha Conservation and City of Kawartha Lakes, dated November 2018, for the Burnt River.
- 3) Field survey of the Burnt River by Kawartha Conservation, dated November 2018, for the Burnt River.
- 4) Field survey of the Burnt River by Kawartha Conservation, dated November 2018, for the Burnt River.
- 5) Field survey of the Burnt River by Kawartha Conservation, dated November 2018, for the Burnt River.
- 6) Field survey of the Burnt River by Kawartha Conservation, dated November 2018, for the Burnt River.
- 7) Field survey of the Burnt River by Kawartha Conservation, dated November 2018, for the Burnt River.
- 8) Field survey of the Burnt River by Kawartha Conservation, dated November 2018, for the Burnt River.

REVISIONS			
No.	Description	By	Date
1	Burnt River Flood Plain Map	TJP	MAY 2019





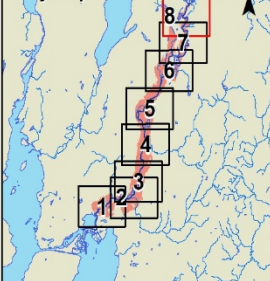


# Burnt River Flood Plain Map City of Kawartha Lakes Printed: May 2019

## Legend

- Burnt River
- Cross Section
- 1.0 m LIDAR Contours
- 1.0 m SCOP Contours
- Draft Flood Plain
- LIDAR Boundary

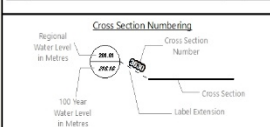
## Key Map



## Notes:

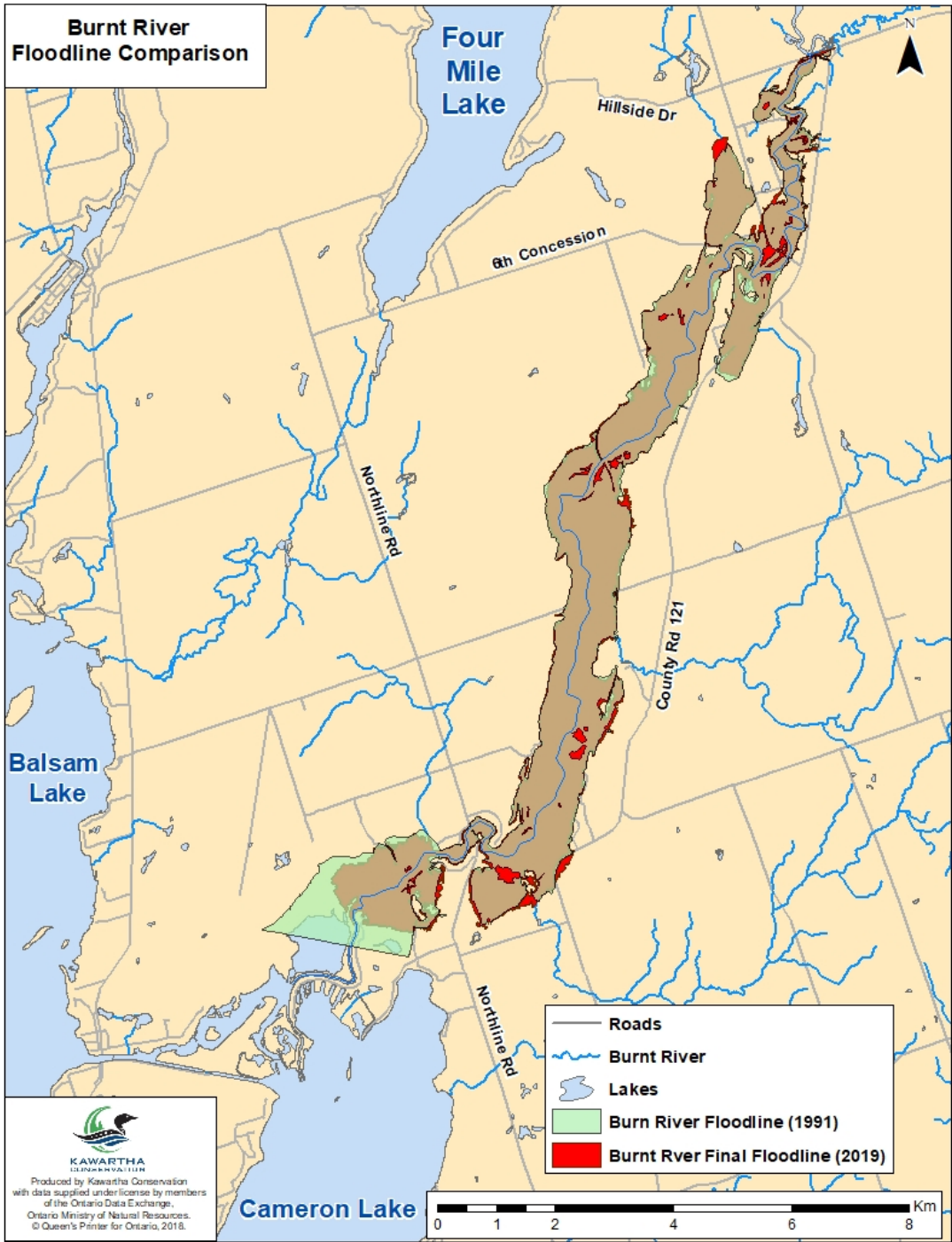
1. LIDAR (Light Detection and Ranging) survey data collected November 08, 09, 10, and 11; 2012; and 2013; 100%.
2. Contours produced by Kawartha Conservation GIS using LIDAR and EPMR 2000 data.
3. Draft Flood Plain Boundary by Kawartha Conservation using 100% LIDAR.
4. Cartography: Map created November 08, 2012.
5. Map drawn by: SCOP (City of Kawartha Lakes) and used to supplement 2013 Cartography.
6. The Flood Plain Boundary was only delineated using the SCOP derived from LIDAR by Kawartha Conservation GIS.
7. Flood plain modeling was prepared by Kawartha Conservation's engineering department.
8. Map preparation and cartography were prepared by Kawartha Conservation GIS department.
9. This map is prepared for use in description with the Flood Plain Mapping Study Contract 2018.

REVISIONS			
No.	Description	By	Date
1	Burnt River Flood Plain Map	NP	MAY 2019





# **Burnt River Floodline Comparison**





# Things We Would Like Prevent to Future Development



Sinister Creek



Burnt River



Shadow Lake



Minden – Gull River



# Thank You

