



# Karst Management in British Columbia

Christine Lohr and Hannah Horn of the  
Ministry of Forests, Lands, Natural Resource Operations  
and Rural Development  
and  
Dr. Paul Griffiths

Nov 3

6:00 pm PT

ZoomRoom: 834 9598 7685

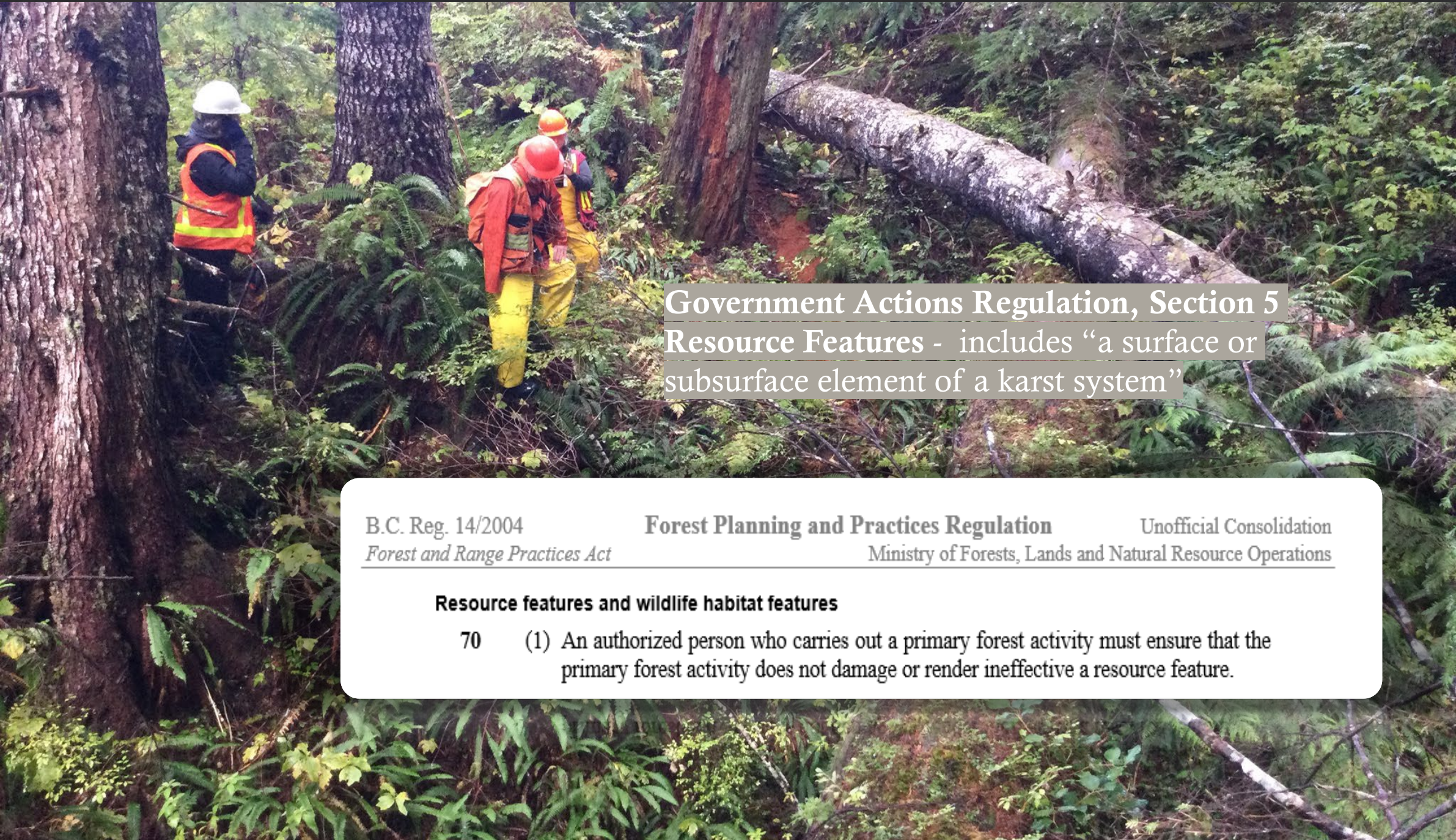
Passcode: 397907





Government's approach to managing karst in B.C.

# Major legislation affecting karst management



**Government Actions Regulation, Section 5**  
**Resource Features** - includes “a surface or subsurface element of a karst system”

B.C. Reg. 14/2004  
*Forest and Range Practices Act*

**Forest Planning and Practices Regulation**

Unofficial Consolidation  
Ministry of Forests, Lands and Natural Resource Operations

## **Resource features and wildlife habitat features**

- 70 (1) An authorized person who carries out a primary forest activity must ensure that the primary forest activity does not damage or render ineffective a resource feature.

# Forest and Range Practices Act Regulations

## Six Natural Resource Districts:

- Campbell River
- Chilliwack
- Haida Gwaii
- North Island
- South Island
- Sunshine Coast

## Identifies these karst features:

- Karst caves
- Significant surface karst features
- Important features and elements within very high or high vulnerability terrain

**BRITISH COLUMBIA**

File: 16400-06  
Date: May 30, 2007

**ORDER TO IDENTIFY KARST RESOURCE FEATURES  
FOR THE  
CAMPBELL RIVER FOREST DISTRICT**

Pursuant to Section 5 of the *Government Actions Regulation of the Forest and Range Practices Act (FRPA)*, I hereby identify the following surface or subsurface elements of a karst system as resource features wherever they are found within the Campbell River Forest District, effective June 30, 2007.

- Karst caves
- Significant surface karst features
- The important features and elements within very high or high vulnerability karst terrain

*[Signature]*  
Annette, District Manager  
Campbell River Forest District  
Ministry of Forests

May 30/2007  
Date


# Other Legal Designations: Opportunities to co-locate with karst & caves

- Wildlife habitat areas
- Wildlife habitat features
- Old growth management areas
- Parks/ Protected areas
- Wildlife management areas
- Private conservancies



# Other Legal Controls

- Crown Land Authorizations (Land Act) – commercial/ organized not-for-profit use of caves

# Strategic Planning Processes

- Strategic Land Use Planning – zoning and objectives to protect values of concern

Example: Haida Gwaii Land Use Objectives Order. Legal objectives for karst and forestry

- Forest Landscape Planning - opportunity to plan for karst catchment areas

# Non-legislated karst management guidance

## Karst Inventory Standards and Vulnerability Assessment Procedures for British Columbia

Prepared by  
Ministry of Forests  
Research Branch  
for the The Karst Task Force  
Resources Information Standards Committee

January 2003

Version 2.0

## Karst Management Handbook for British Columbia



BRITISH COLUMBIA  
Ministry of Forests

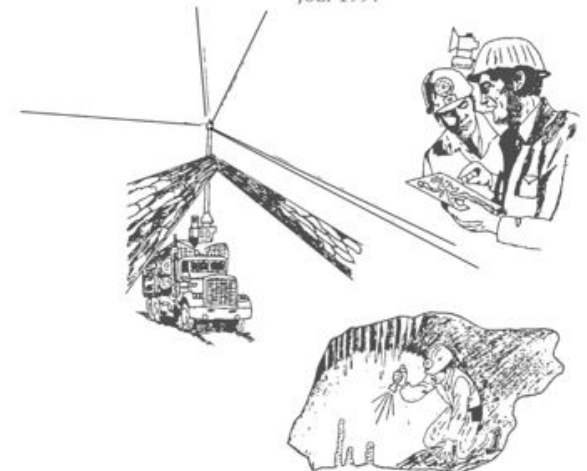
May 2003

## CAVE/KARST MANAGEMENT HANDBOOK

FOR THE

VANCOUVER FOREST REGION

JULY 1994



Province of  
British Columbia

Ministry of  
Forests

Forest Service

# Opportunities for improvement – Input from Karst Science Advisory Group (KSAG)

1. Recommended improvements to forest practice requirements
  - buffers around dolines, karst streams and springs, sinking streams; practices to better protect karst soils
2. Better protection of Karst Old Growth
3. Opportunities to plan for karst at a landscape level as part of Forest Landscape Planning
4. Improved karst potential mapping.
5. Using LiDAR to better map karst features
6. Review and update karst guidance materials
7. Strengthened online information, training

# Video: exurgence /cave



*Video credit: Murray Estlin*

◇ [Click here for video](#)



FREP karst evaluations

# Purpose of FREP

## (Forest and Range Evaluation Program)



- ◆ To assess the impacts of forest and range activities on the 11 FRPA resource values to determine if the on-the-ground results are achieving government's desired outcomes for these values;
- ◆ To monitor and report on the condition of resource values, including trends and causal factors; and
- ◆ To identify opportunities for continued improvement of practices, policies and legislation.

# Karst evaluation question

## Overall Question:

“Are current forest practices protecting and maintaining the structure, function and ecological integrity of the surface and subsurface elements of karst systems?”

## Current Protocol:

*“Are current forest practices protecting and conserving surface karst features and higher vulnerability karst terrain?”*

## Premise:

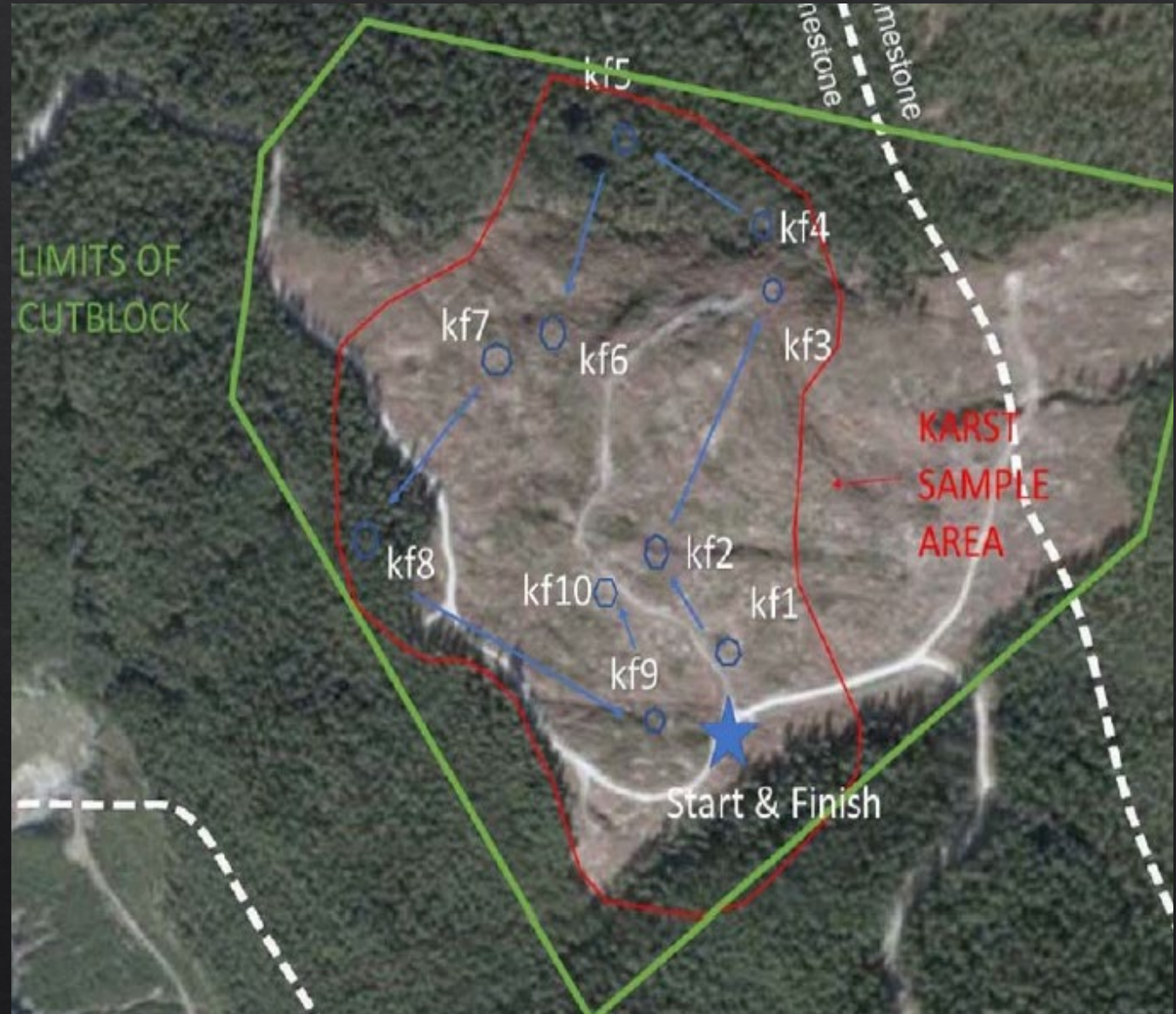
- Surface disturbances result in impacts to surface and subsurface.
- We can only observe the surface.

## Assumptions:

- Surface karst features are a proxy for the karst system.
- If disturbances are absent or few, assume karst is protected.
- Only recent disturbances are considered.

# Framework of the FREP karst evaluation

- ◇ Randomly select cutblock to be evaluated.
- ◇ Define the karst sample area (KSA).
- ◇ Select a sample of surface karst features (SKFs) from the “known” set of features.
- ◇ In the field, evaluate the SKFs, noting presence & extent of disturbance indicators.
- ◇ Roll up results for the KSA.
- ◇ Score or rate how well karst was protected on the site – (This rating system is still under development).



# Surface karst features

1. Cave entrance - CE
2. Karst spring - KS
3. Sinking stream - SS
4. Sinking watercourse - SW
5. Sinkhole (doline) - SH
6. Epikarst exposure - EE
7. Other surface karst feature – OT

## Feature Complexes & Feature Clusters



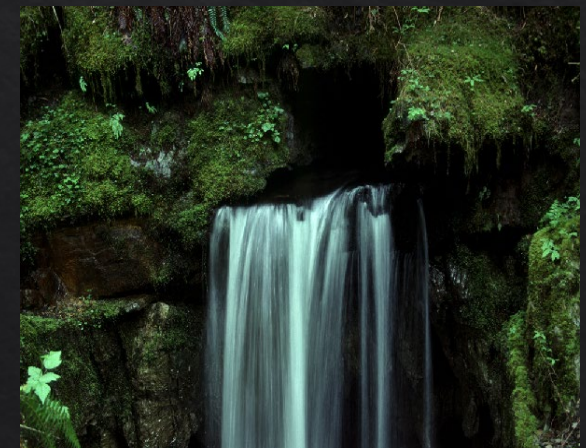
CE / SS COMPLEX



CE / SH COMPLEX



EE



KS

# Evaluation of disturbances on SKFs

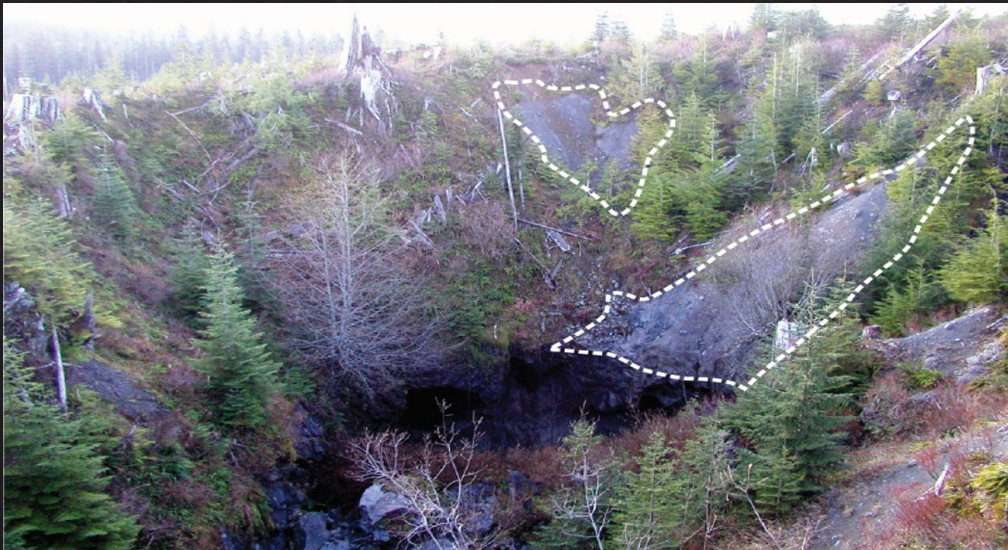
## 7 Indicator Questions

- Q1: Were any trees removed from the karst feature?
- Q2: Is there any new windthrow at the karst feature?
- Q3: Has any road material or logging slash been introduced into the karst feature?
- Q4: Has any disturbance to the forest floor, mineral soil or bedrock occurred at the karst feature?
- Q5: Has any recent burning occurred at the karst feature?
- Q6: Is there a change in natural shade at the karst feature?
- Q7: Is there a change to the understory vegetation at the karst feature?

Additional: Is there any evidence of previous disturbance to the karst feature?



E.g. Tree removal, shade alteration



E.g. Exposed mineral soil, tree removal, shade alteration



E.g. Windthrow

# How the results are used

- ◆ Data is summarized; ( E.g. pie charts)
- ◆ Answer a series of “Closing Questions” to generate recommendations;  
E.g.:

*Were all caves adequately identified and mapped prior to the FREP Karst Evaluation?*

*Were tree removal and shade alteration the only disturbance types for surface karst features sampled in the harvest area?*

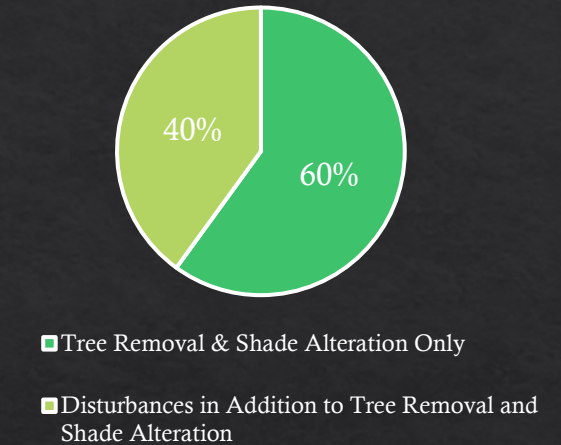
*Did all surface karst features in retention areas avoid disturbance?*

*Did the harvesting activities avoid higher vulnerability karst areas of the KSA?*

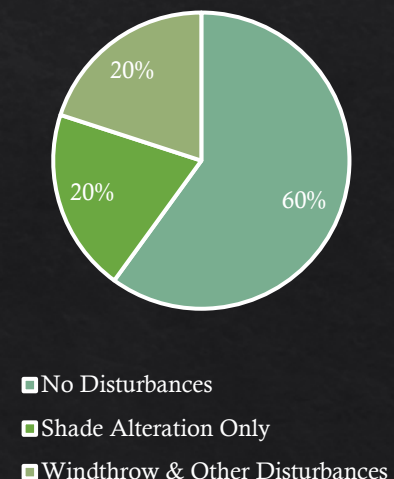
*Did the roads, quarries and landings avoid higher vulnerability karst areas of the KSA?*

- ◆ For each KSA evaluated, a “score” or rating will be determined and will describe how well government objectives to protect karst has been met. (This rating system is currently in development).
- ◆ To help meet FREP’s purpose of identifying opportunities for continued improvement of practices, and to bring about change to policies and legislation.

Types of Disturbances on Features within Harvest Area



Types of Disturbances on Features in Retention Area





Questions?

# Thank you

Hannah Horn

[Hannah.Horn@gov.bc.ca](mailto:Hannah.Horn@gov.bc.ca)

Christine Lohr

[Christine.Lohr@gov.bc.ca](mailto:Christine.Lohr@gov.bc.ca)

Resource Planning and  
Assessment Branch

---

*November 3, 2021*

