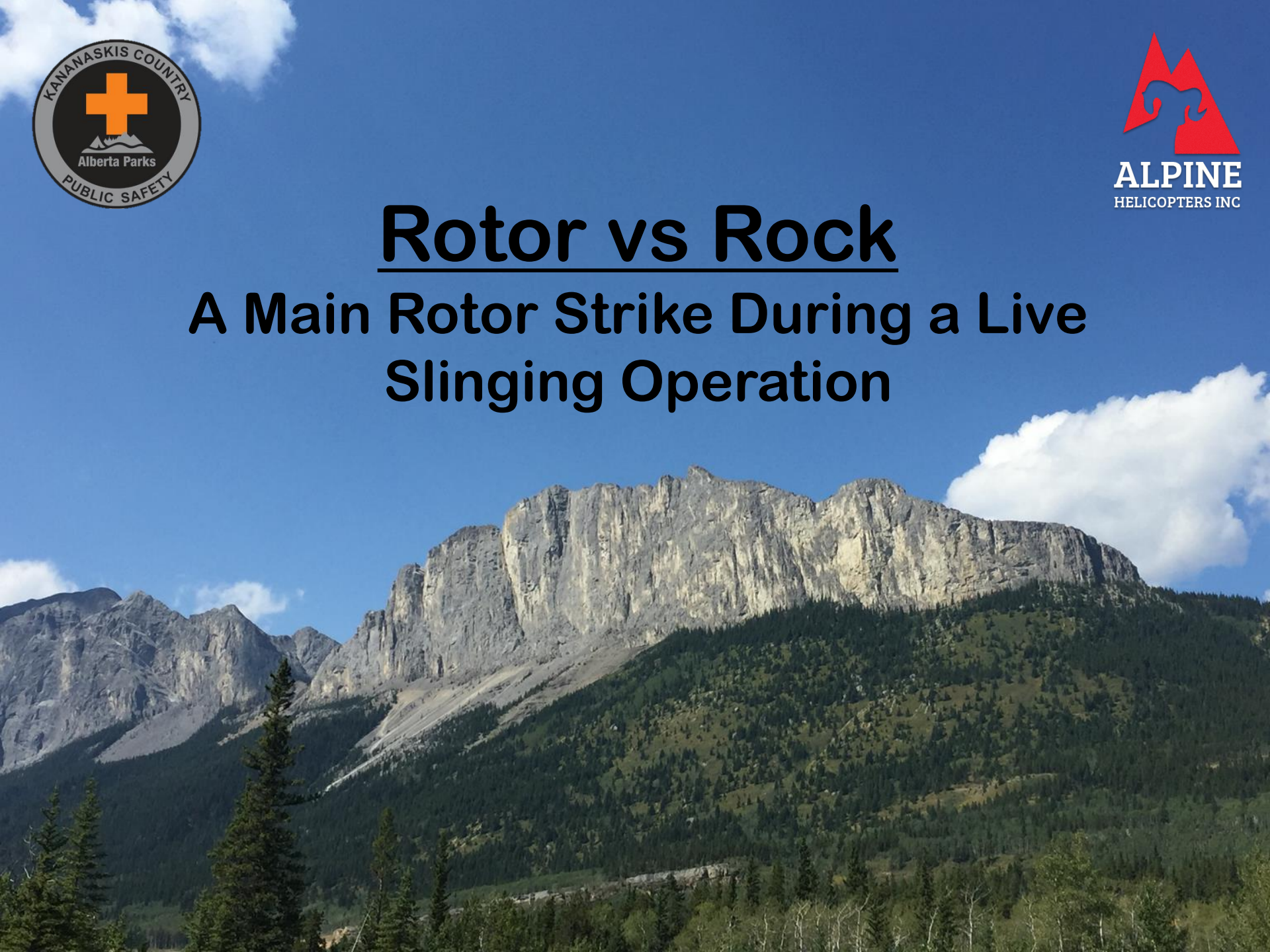
Rotor vs Rock

A Main Rotor Strike During a Live Slinging Operation



Presentation Goals

- Share the story & the outcomes
- Work with peers to find solutions to operational limitations
- An opportunity for other agencies to be “ahead of the learning curve”

Public Safety Specialists

- Work within Kananaskis Country, Alberta, Canada
- 10-12 calls annually involving close proximity flying
  - Pilots have more exposure to these calls
- PS Specialists are certified, professional guides who have additional training in:
  - High angle rope rescue
  - Helicopter use for mountain rescue
    - Including Class D or “Human External Cargo”
    - Technical slinging capabilities

Helicopters & Rescue Pilots

Alpine Helicopters Inc. provides all rescue flights for Kananaskis Public Safety & Parks Canada.

Alpine Helicopters Provides:

- 6 Rescue Pilots between Canmore, Alberta and Golden, British Columbia
- A single engine Bell 407 helicopter for Day VFR missions utilizing the Boost Rescue System
- Aircraft is on standby 365 days a year from Canmore base
- Annual re-current training & check flights
- Since January 1st, 2017 Alpine has responded to 221 calls, 121 of which were HEC/Class D

ALPINE
HELICOPTERS INC

Helicopters & Rescue Pilots

- Alpine Rescue Pilots are certified by Parks Canada
- The 6 Pilots average
  - 9,825 hours total time
  - 7,480 hours mountain
  - 2,850 hours longline
- Parks Canada flight test requirements;
  - 2,500 hours total time
  - 1,000 hours mountain
  - 500 hours longline
- Parks Canada's 5-7 hour flight test contains 4 phases
  - Vertical reference / barrel test
  - Mountain flying
  - Advanced and high altitude mountain flying
  - Simulated HEC/Class D live load flying
- Since the inception of the Parks Canada rescue program in 1972 there had not been a HEC/Class D accident within either agency

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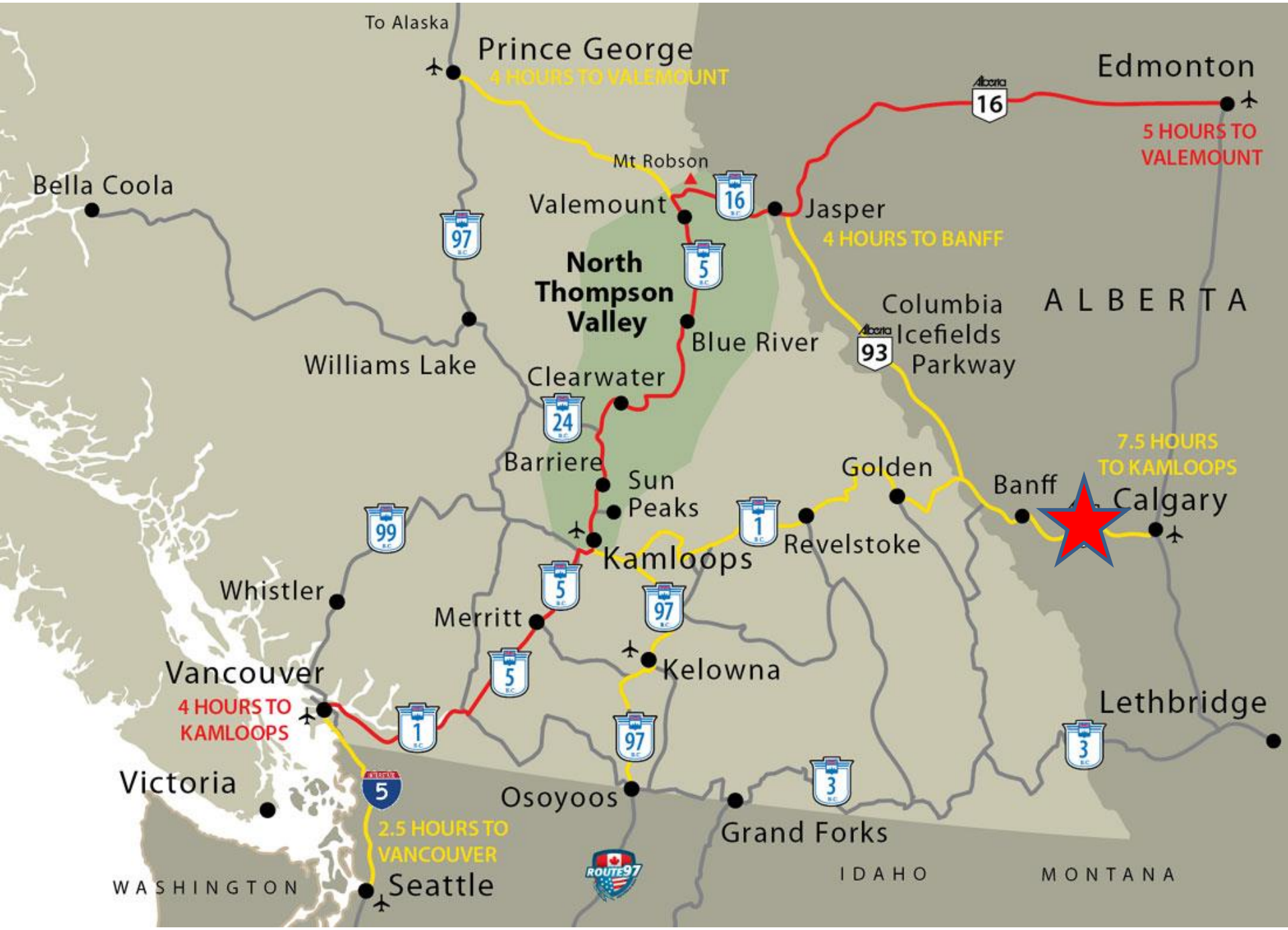
Experience with close proximity flying

Public Safety staff

- 5-7 rescues annually where rotor clearance is a consideration in technical terrain
- Avalanche control work-
  - Class D is NOT involved, however many start zones are near cliffs

Pilots

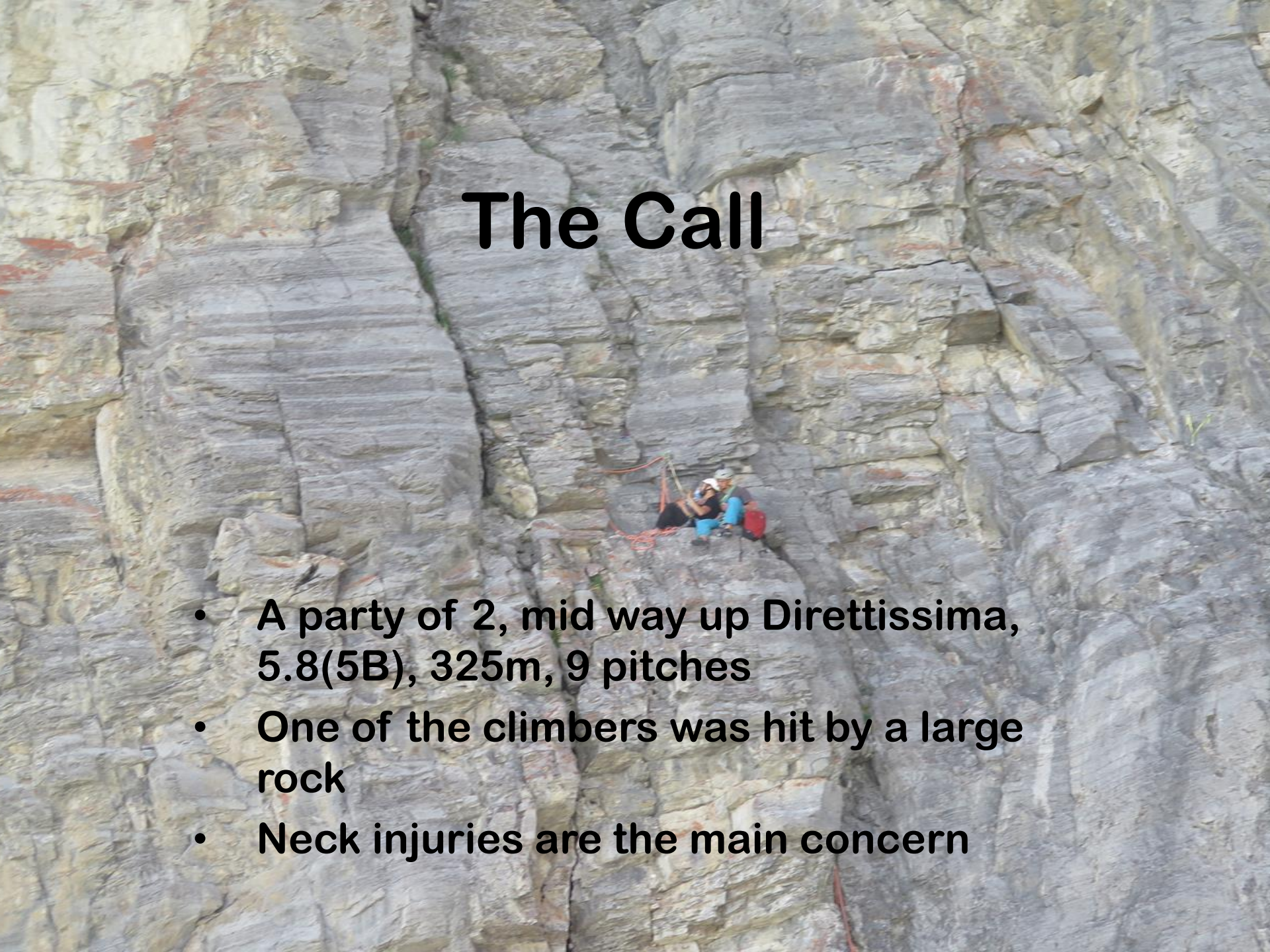
- Significantly higher due to working with Parks Canada, the heli ski industry & industrial work


To Alaska
Prince George
4 HOURS TO VALEMOUNT
Edmonton
5 HOURS TO VALEMOUNT
Mt Robson
Bella Coola
Valemount
Jasper
4 HOURS TO BANFF
North Thompson Valley
Columbia Icefields Parkway
ALBERTA
Blue River
Williams Lake
Clearwater
Barriere
Sun Peaks
Golden
Banff
Calgary
7.5 HOURS TO KAMLOOPS
Revelstoke
Kamloops
Whistler
Merritt
Kelowna
Vancouver
4 HOURS TO KAMLOOPS
Lethbridge
Victoria
Osoyoos
Grand Forks
2.5 HOURS TO VANCOUVER
Seattle
WASHINGTON
IDAHO
MONTANA
ROUTE97

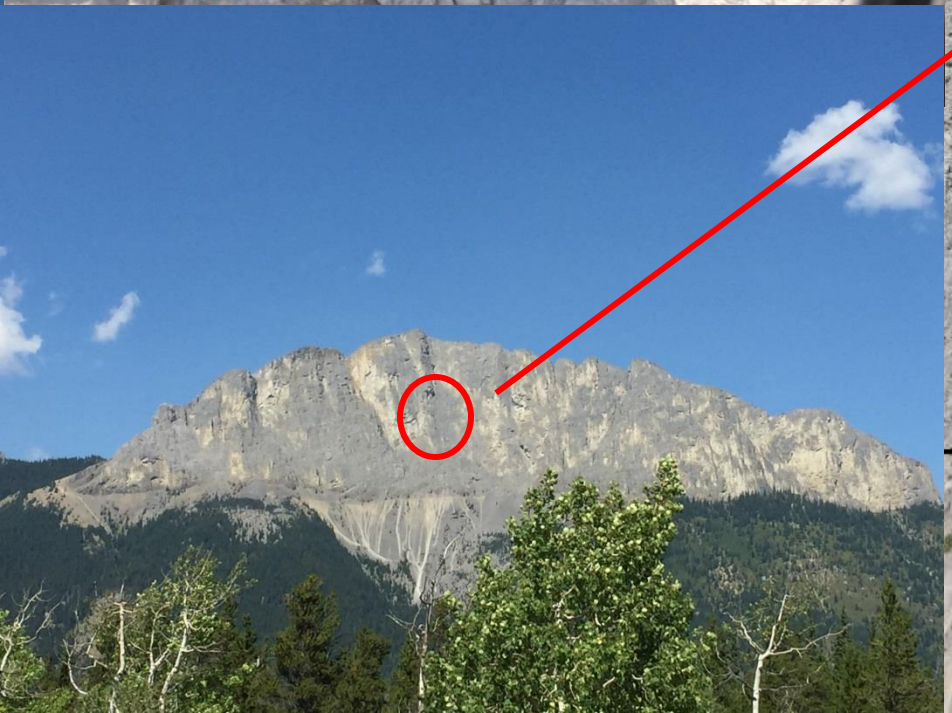
Mount Yamnuska

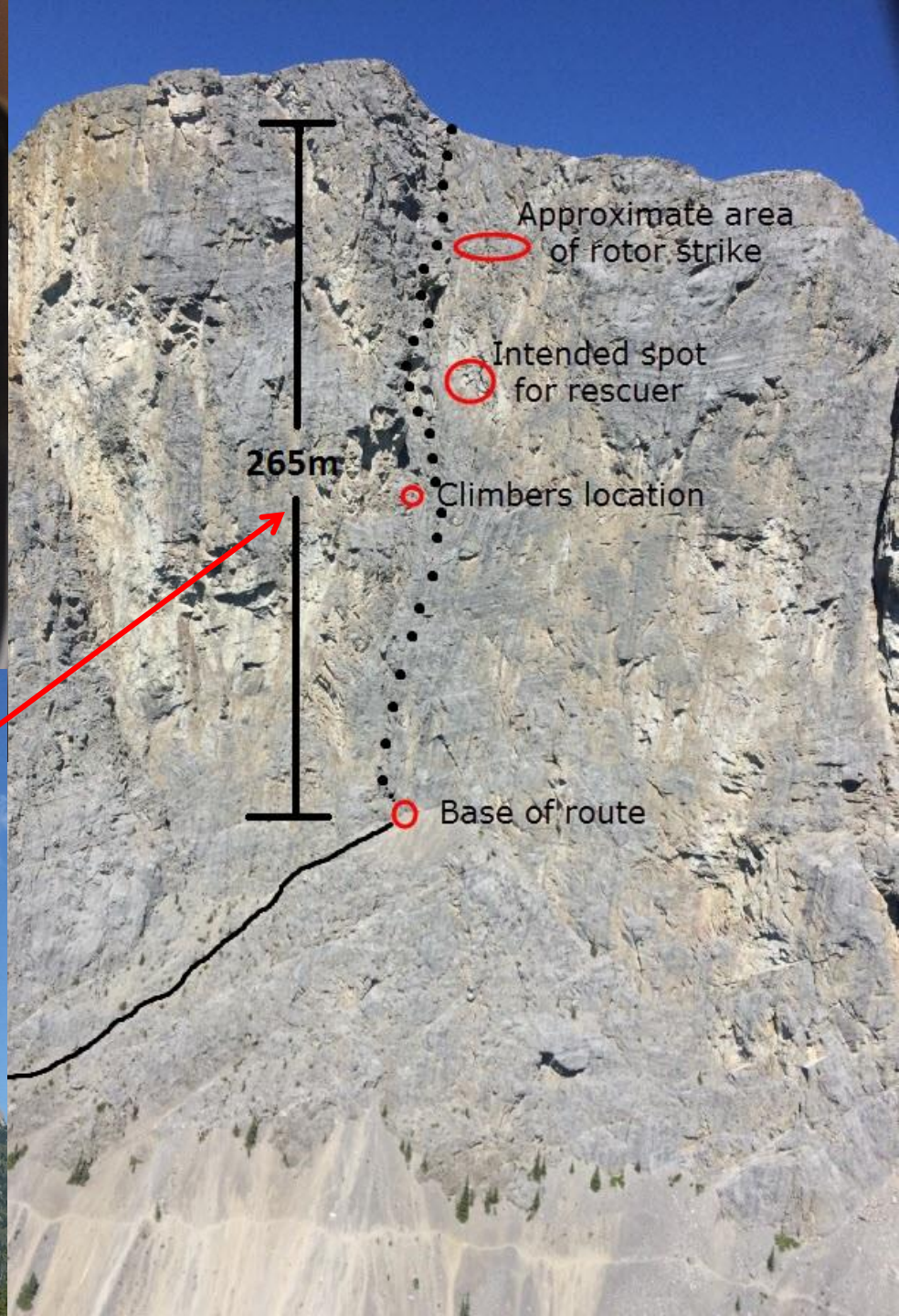
- Over 150 technical rock climbing routes on the face
- Routes are long and technically challenging
- Most routes tend to be vertical to overhanging with a “wandering” nature
- The rock quality is poor!!
- Often a windy area due to it’s Eastern slope location

The Call



- A party of 2, mid way up Direttissima, 5.8(5B), 325m, 9 pitches
- One of the climbers was hit by a large rock
- Neck injuries are the main concern



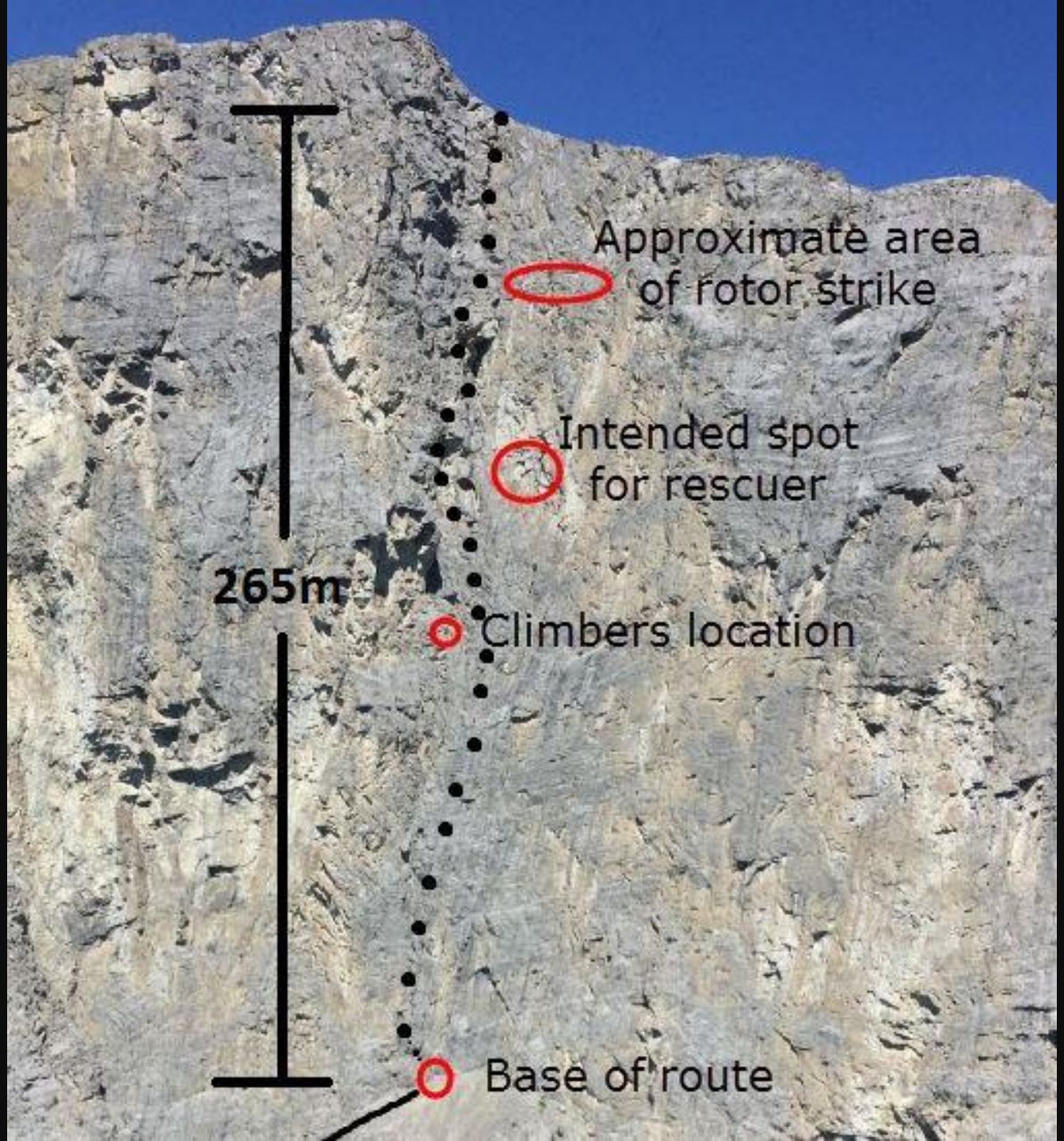

Approximate area
of rotor strike
Intended spot
for rescuer
265m
Climbers location
Base of route

The Initial Response

- A Bell 407 launches from the town of Canmore, an 8 minute flight
- 3 Public Safety Specialists on board, plus the pilot
- Extensively trained Conservation Officers arrive to support
- All crew members agreed a direct sling was appropriate for this situation

The Incident

- 200ft (61m) rope was used
- Pilot flew direct with live load
- Rescuer was within inches of the ledge
- Staff described hearing a “gun shot” or “thunder”
- Conservation Officer on top declared a rotor strike over the radio
- The pilot declared an emergency landing
- The landing flight took 1.5 minutes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The Secondary Response

- Pilot and rescuer voluntarily removed from operations
- A second rescue team was brought in to climb to the subjects
  - Additional Kananaskis Public Safety
  - 2 members of Parks Canada Visitor Safety
- A second helicopter and rescue pilot was brought in to finish the rescue
- The subject was lowered using an organized rope rescue and another heli-sling

Aircraft Damage

- Extensive maintenance required to repair, overhaul or replace the following
  - Turbine-Compressor-Engine Gearbox-Drive Shaft-Free Wheel-Transmission-Mast-Main Rotor Head-Blades
  - Cost was significant
- Aircraft was disassembled and trailered back to hangar before rescue was completed
- Aircraft returned to service 11 days later

Post Incident Investigations

- Transport Canada
  - National Transportation Safety Board(NTSB)
- Alpine Helicopters internal investigation
  - Began immediately after the accident by local managers and Chief pilot
  - Rescue Pilot placed on temporary hiatus from rescue program pending ongoing evaluation
- Alberta Government commissioned an independent report to identify deficiencies within the program and offer recommendations

Lessons Learned

Alpine

- A trial run using an empty line to check for rotor clearance and hazards should be performed prior to insertion of rescuer
- Removal of the door & basket to increase visibility for pilot
- More training
  - With 200ft and longer longlines
  - In vertical terrain
  - With extendable poles for reaching accident scenes with limited clearance
  - For emergency landing situations

Rescuer/Agency

- KCPS self implemented:
  - Documentation of decision making
  - More frequent & enhanced Class D training
  - Internal procedures for dealing with the outcome of incidents
  - Possible placement of permanent anchors and safe rescuer insertion points

- An independent report recommended:
  - A modification of staff training that would see more climbing time
  - Staffing levels that maintain adequate coverage after an involved rescue
  - A documented risk assessment for each rescue


Thank You for listening
Questions or comments?