



Rotor vs Rock

A Main Rotor Strike During a Live Slinging Operation



Presentation Goals

A grayscale photograph of a mountain range with a road winding through a valley in the foreground. The mountains are rugged and layered, with some peaks partially obscured by mist or clouds. The road in the foreground is a multi-lane highway that curves through the valley, leading the eye from the bottom of the frame towards the mountains.

- **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
- 5-7 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



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



Experience with close proximity flying

Public Safety staff

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

Pilots

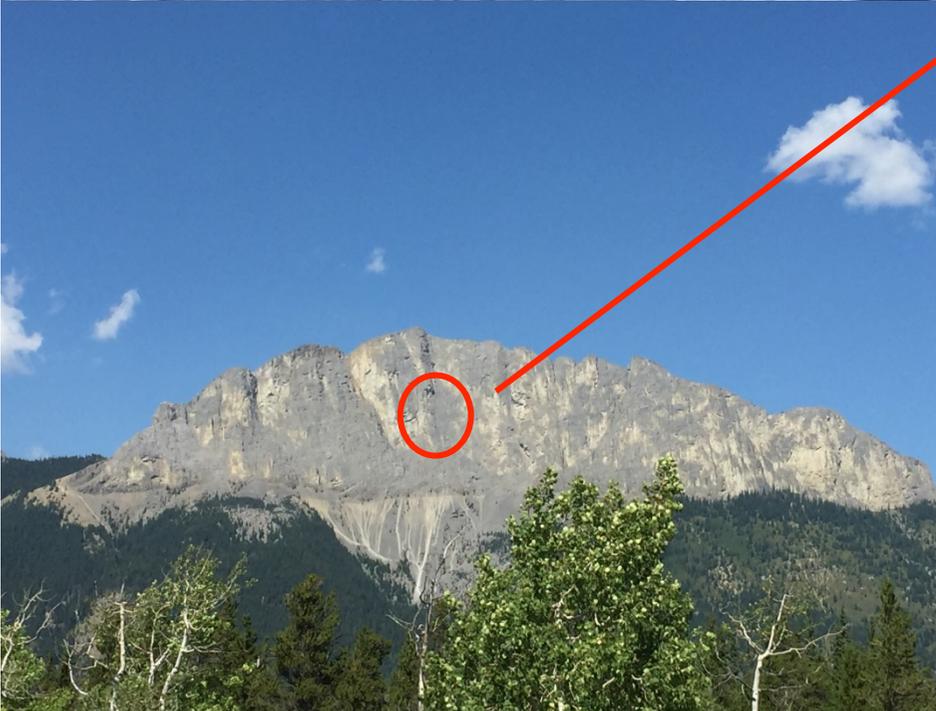
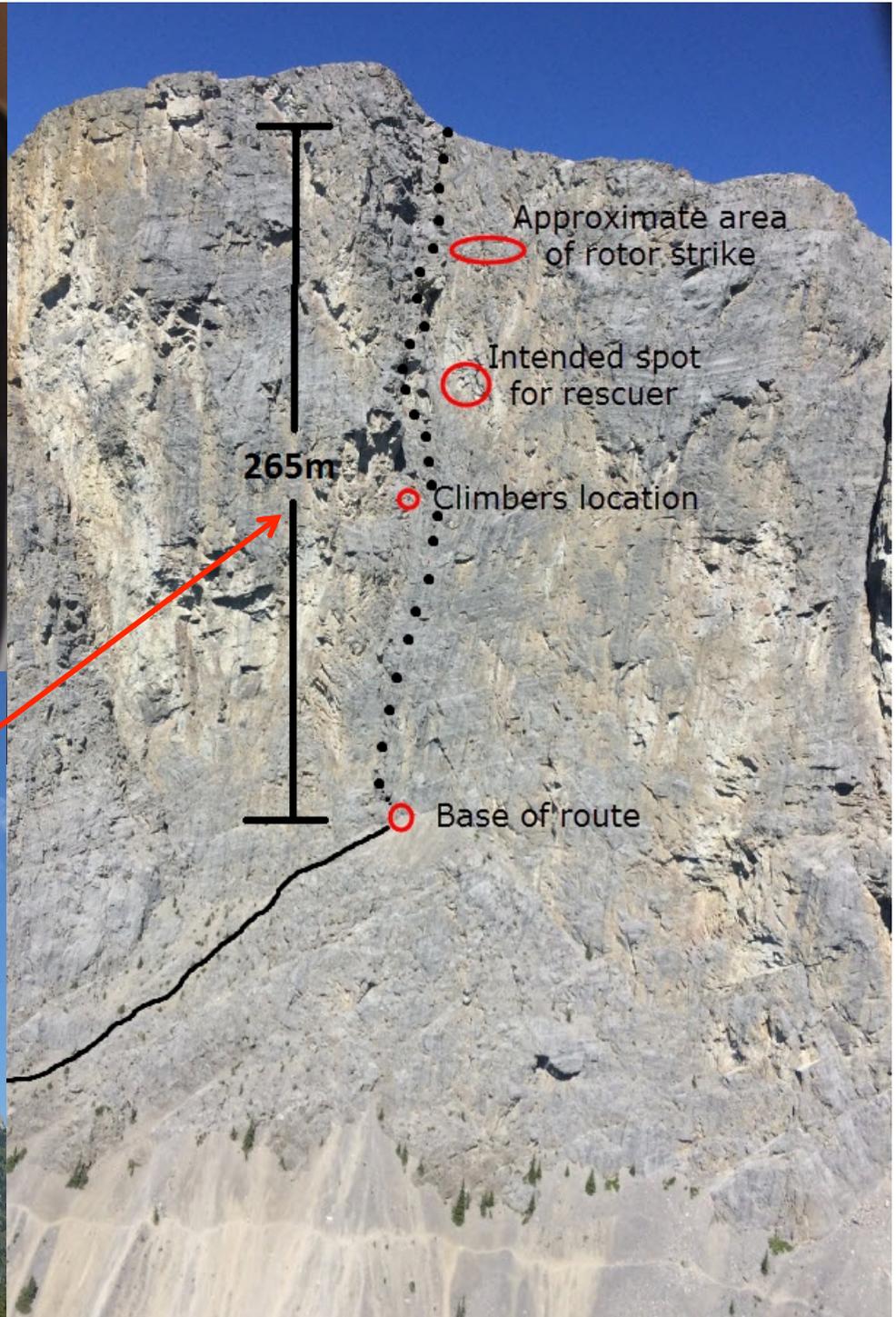
- Significantly higher due to working with Parks Canada, the heli ski industry & industrial work

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

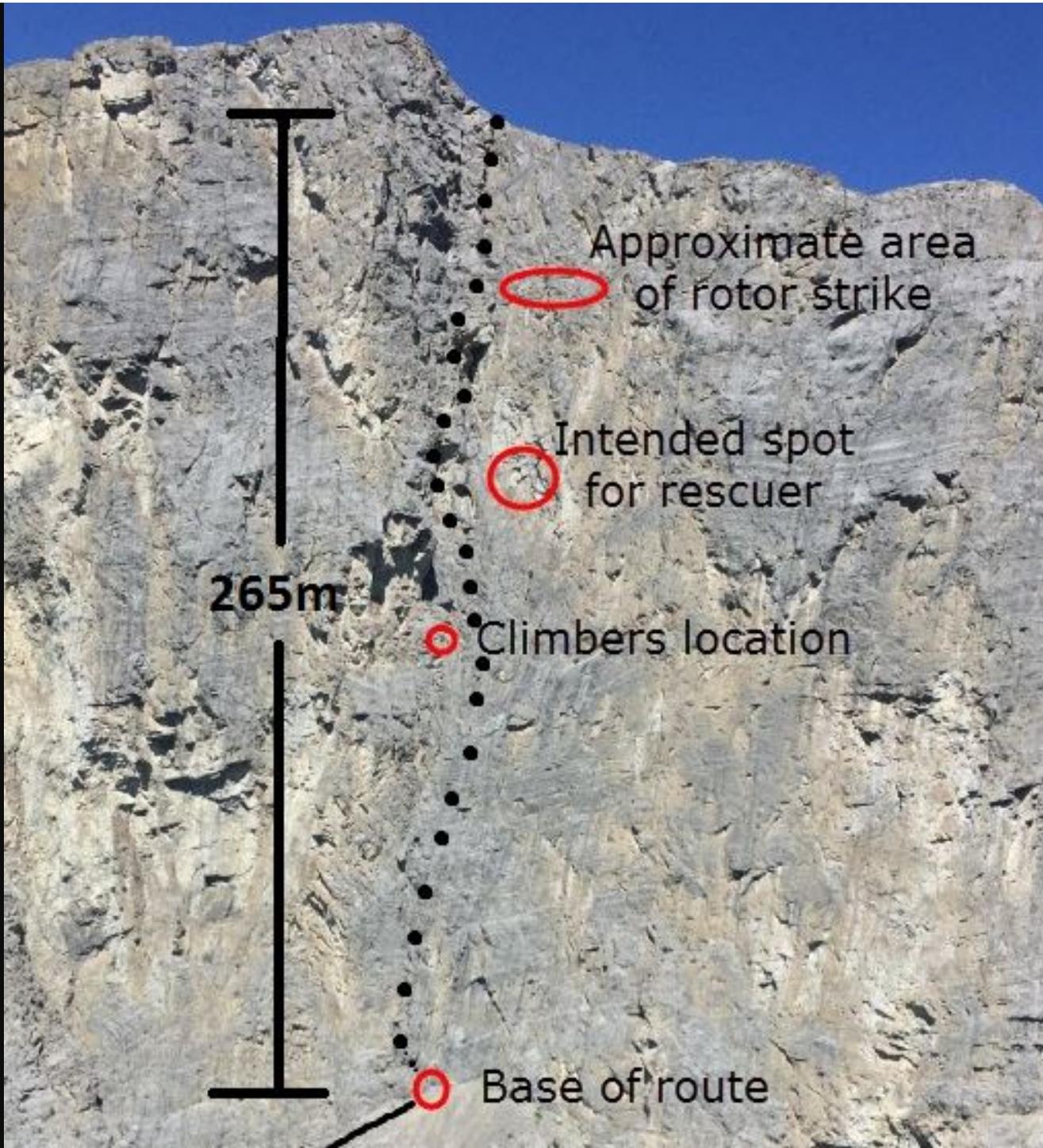


The Initial Response

- 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



Approximate area
of rotor strike

Intended spot
for rescuer

Climbers location

Base of route

265m

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 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 and safe rescue insertion points
- An independent report recommended:
 - A modification of staff training that would see more climbing time
 - Staffing levels that maintain capacity & resiliency
 - A documented risk assessment for each rescue



Thanks for listening.

Questions?