



# DOI FY 07 Aviation Mishaps



**Kyle, SD**



**Omak, WA**



*ALL  
Human  
Performance  
Issues*

**Winnemucca, NV**



**Aberdeen, SD**



**Bethel, AK**





# DOI FY 07/08 Aviation Mishaps



The National Transportation Safety Board

NTSB 831.13 Flow and dissemination of accident or incident information.

(b) ... Parties to the investigation may relay to their respective organizations information necessary for purposes of prevention or remedial action.

... However, no (release of) information... without prior consultation and approval of the NTSB.

This information is provided  
for accident prevention purposes only



*Kyle, SD*  
*July 7, 2007*



**PZL M-18B**  
**Dromader**

**Mission**

Fire Suppression

**Damage**

Substantial

**Injuries**

1 Minor

**Procurement**

Call When Needed

**NTSB ID**

CHI07TA201





*Kyle, SD*  
*July 7, 2007*



## NTSB Probable Cause.

The agricultural application airplane sustained substantial damage when it impacted terrain while maneuvering for a public use aerial application of fire retardant. The pilot stated that he was approaching a fire location from the northwest. He was crossing a "burnt area from west to east across gently rolling terrain." When he crossed a ridgeline, he encountered a downdraft and the airplane "wanted to settle." The pilot "pushed [the] nose over and released [the] load." The pilot stated that the airplane would not recover before impacting terrain. The pilot reported no mechanical malfunctions with the airplane in reference to the flight. Gusty winds were present in the area at the time of the accident.

**The National Transportation Safety Board determines the probable cause(s) of this accident as follows:** The pilot's failure to maintain clearance from terrain during an aerial application maneuver. Contributing to the accident were wind gusts, low altitude, and the reported downdraft.

Takeoff  
Rapid City  
11:37 MDT

AFF Track

AFF ground speed in mph

**(2) Working (Fire Bombing) Flight**

During wildland fire suppression missions the ferry flight to the operational area is to be conducted at an airspeed of 110 - 120 mph (IAS). At the MGTOW of 11,700 lbs., the minimum maneuvering speed in the zone of operations is 106 mph (IAS). Speeds below this may initiate some changes in the forces acting on the elevator. The PIC can safely operate the aircraft below this speed, but it requires increased PIC attention. Because of the unpredictable updrafts and downdrafts associated within the fire's environment, if at all possible the aircraft's angle of bank should never exceed 30 degrees nor the airspeed exceed 140 mph (IAS).

Last AFF hit  
1218 MDT

# Overview of Accident Site

Mishap aircraft

Last AFF hit  
87 mph  
69' AGL

## 5.2. Stall Speed

Stall speeds have been calculated for the Dromader configured at MGTOW 11,700 lbs. for agricultural spraying and fire fighting.

Bank Angle (degrees)	Stall Speeds, no flaps, no power (mph CAS/IAS)		
	9,260 lbs.	10,360 lbs.	11,700 lbs.
0	81/84	85/88	91/93
15	82/85	87/90	93/95
30	87/90	92/94	99/98
45	97/97	103/100	110/107
60	114/111	121/117	129/125

Note: The values in the border are calculated.

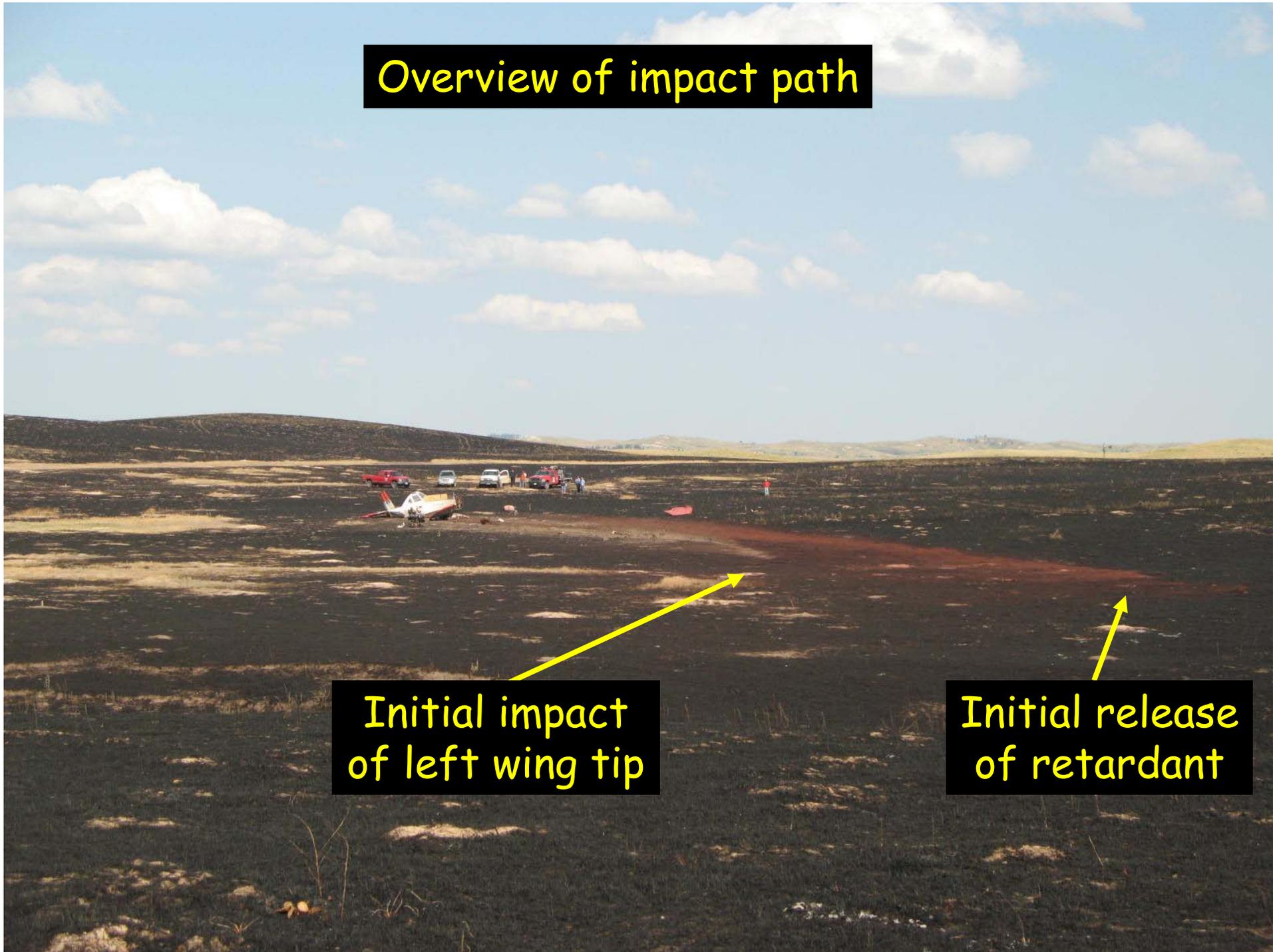
**Eyewitness described aircraft in 60° left bank immediately before impact**



# Overview of impact path

Initial impact  
of left wing tip

Initial release  
of retardant



Close-up of accident site looking east



Short and narrow  
retardant line

A flight helmet saved another life





# AM Observations

## Kyle, SD, July 7, 2007



## Discussion

- Basic airmanship (track, airspeed, and altitude)
- Compliance with Flight Manual Limitations (airspeed and bank angle)
- Compliance with contract (drop height, enroute altitude)
- Communications
- Risks associated with flying over "the black"



# Winnemucca, NV

July 17, 2007



## Air Tractor AT-802A

### Mission

Fire Suppression

### Damage

Destroyed

### Injuries

1 Minor

### Procurement

Exclusive Use

### NTSB ID

LAX07TA222





# Winnemucca, NV

July 17, 2007



## NTSB Probable Cause.

The airplane, along with two others, was engaged in dropping fire retardant on a wildfire. The pilot planned on dropping his load into a retardant gap area that was created by the retardant drops of the other two air tanker aircraft. The pilot reported that he "was anxious to get [to the fire] because that fire was definitely on its way through the gap." During the first run of his drop, the pilot flew in a southerly direction heading downhill. After the first drop, the pilot said he "pulled off left and executed a 270-degree right turn to set up for another drop." The pilot began his second drop heading north uphill into rising terrain. After a few moments, the pilot realized the airplane would not out climb the terrain. He attempted a right turn to remain clear of the terrain; however, the airplane impacted about 10 feet below the crest of a hill in a level attitude. The pilot said that there were no mechanical problems with the airplane, and he had been caught by a downdraft during the drop.

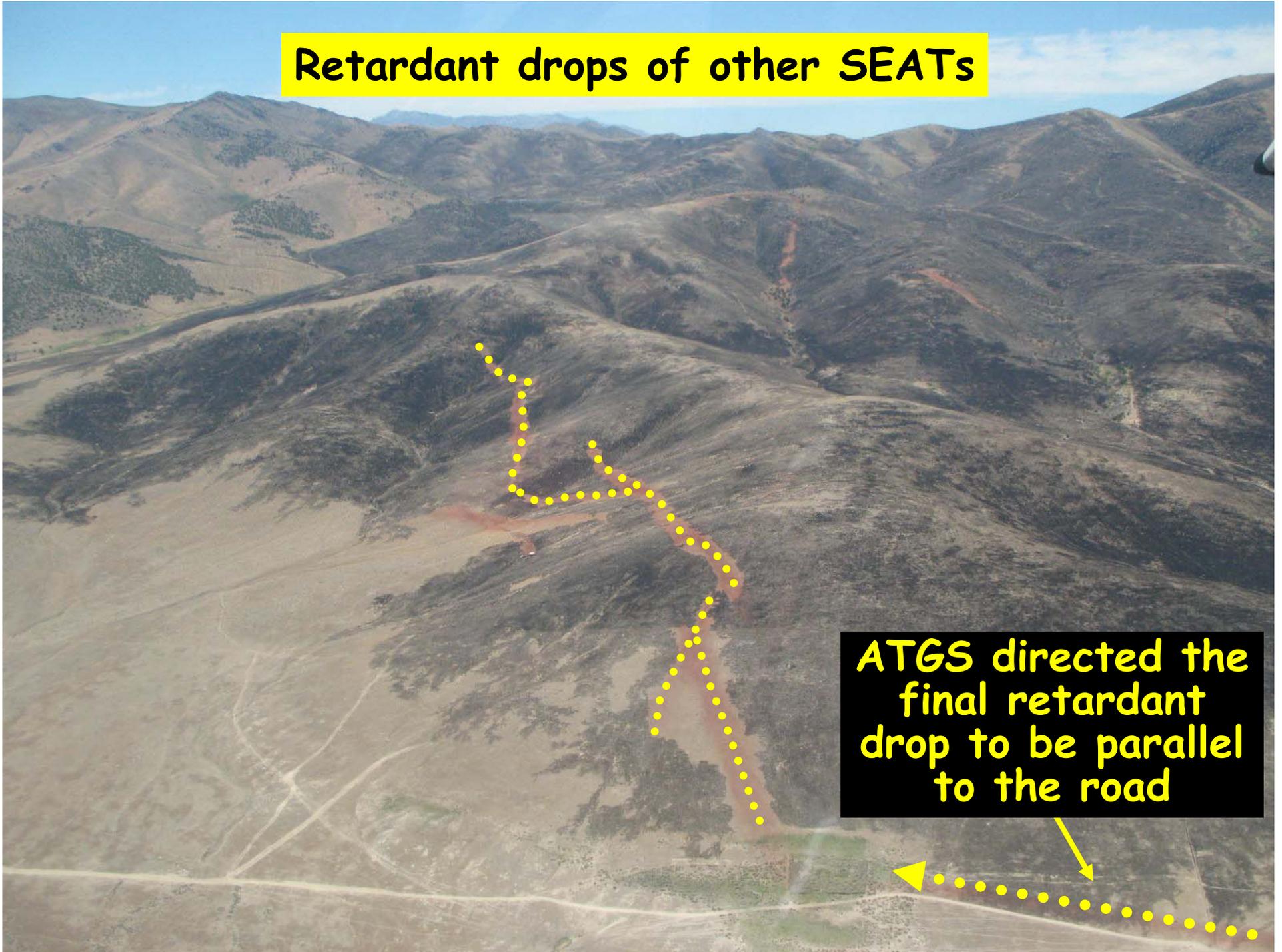
**The National Transportation Safety Board determines the probable cause(s) of this accident as follows:** The pilot's failure to maintain clearance with terrain while maneuvering.

# Overview looking to the West



## Retardant drops of other SEATs

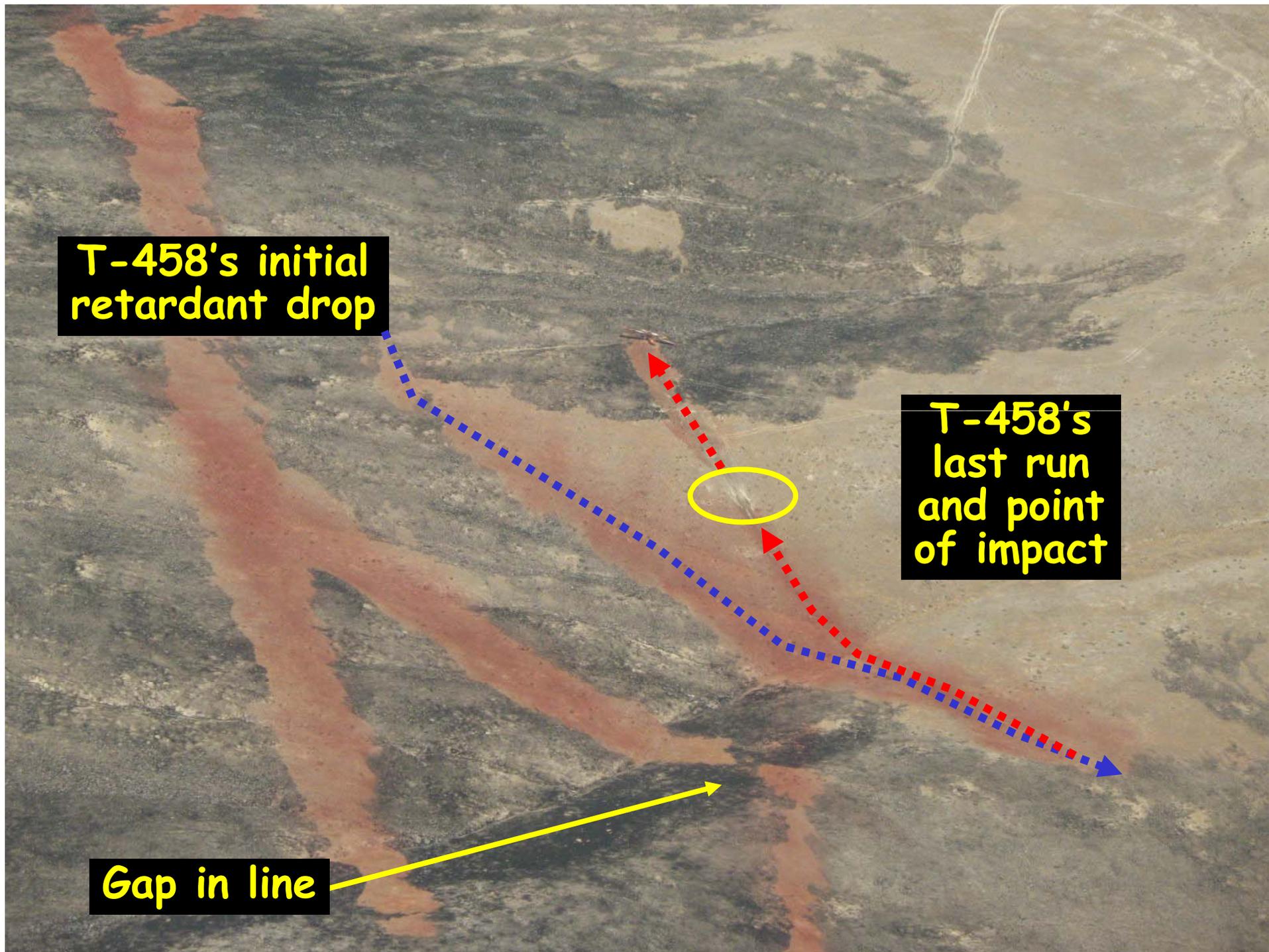
ATGS directed the final retardant drop to be parallel to the road



T-458's initial  
retardant drop

T-458's  
last run  
and point  
of impact

Gap in line



**Wildland fire approaching T-458**



## Wildland fire igniting jet fuel

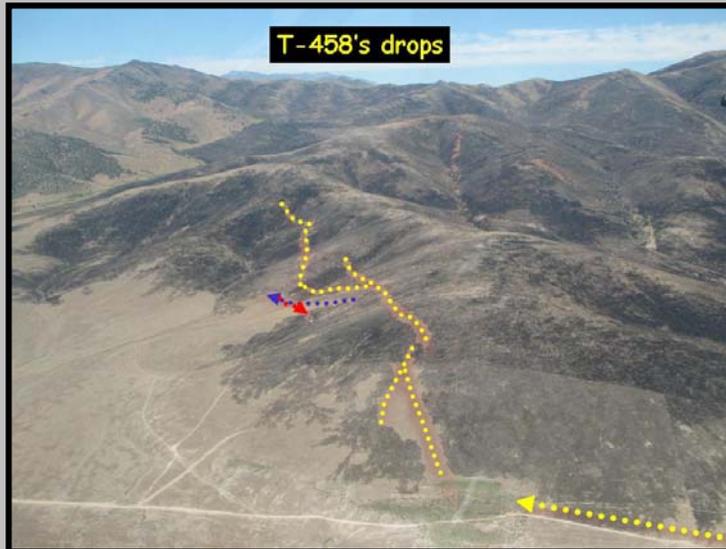






# AM Observations

## Winnemucca, NV, July 17, 2007



### Discussion

- Basic airmanship (airspeed and altitude)
- Decision making (downdrafts and terrain)
- Compliance with contract (minimum drop height)
- Coordination with ATGS and IC
- Risk decision to operate SEATs in mountains vs. open valley



# Omak, WA

July 21, 2007



Hughes 369D

Mission

Fire Suppression

Damage

Minor

Injuries

None

Procurement

Exclusive Use

NTSB ID

SEA07TA212





# Omak, WA

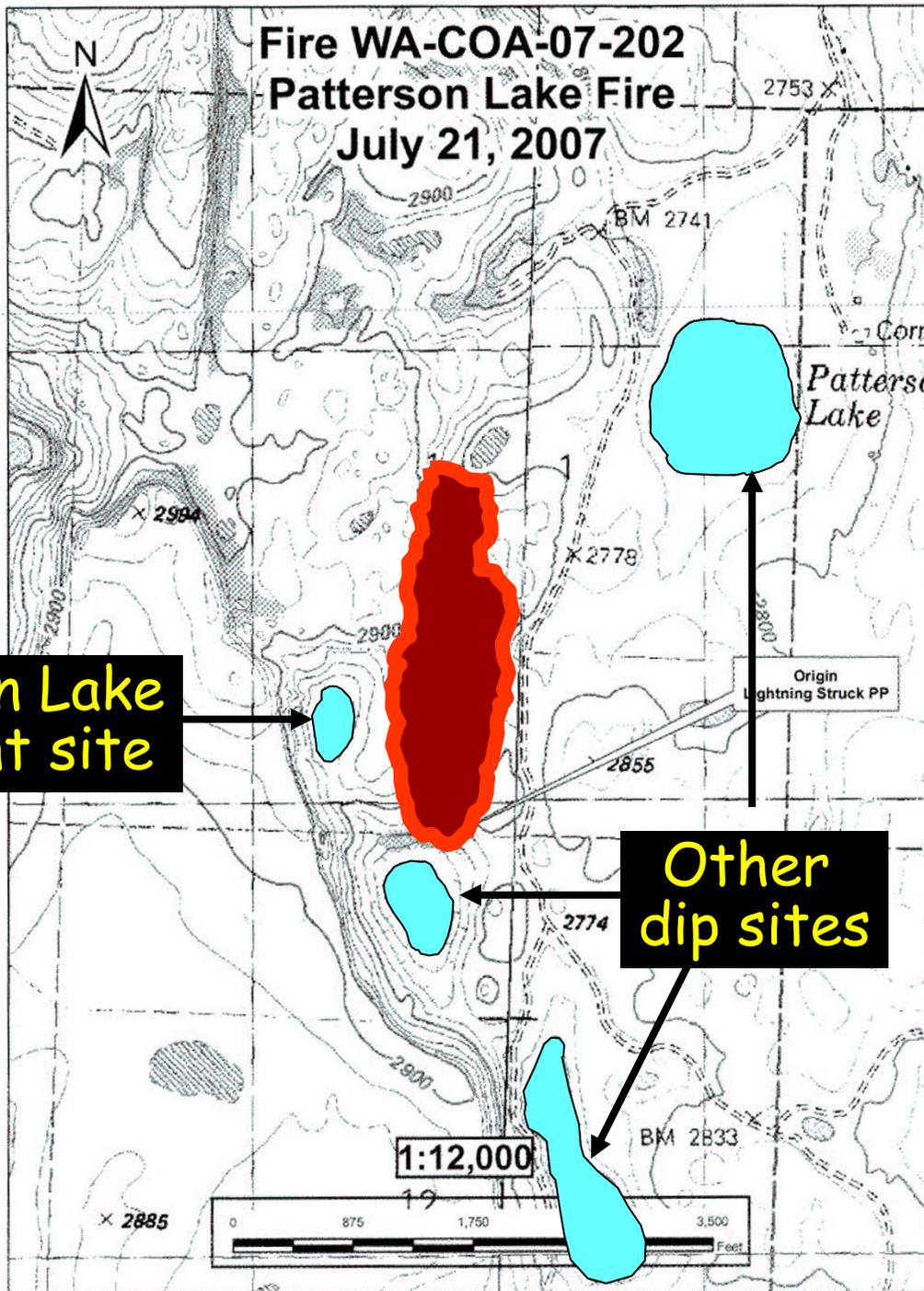
## July 21, 2007



### NTSB Probable Cause.

At the time of the accident, the pilot was descending into a hover over a pond that he was using for an aerial fire bucket refill site. As he began to level off in the hover, he heard a loud noise and felt an "accelerated vibration." Almost immediately thereafter, the helicopter began to spin to the right, so the pilot closed the throttle and made an autorotational landing in about three to four feet of water. A post-accident inspection of the helicopter revealed that the tail rotor driveshaft had failed in torsional overload, and that one of the tail rotor blades had experienced delaminating as a result of contact with the water over which the helicopter was hovering.

**The National Transportation Safety Board determines the probable cause(s) of this accident as follows:** The pilot's failure to maintain clearance from the surface of a pond that he was using as a water bucket refill site, which resulted in a tail rotor strike



Cameron Lake  
accident site

Other  
dip sites

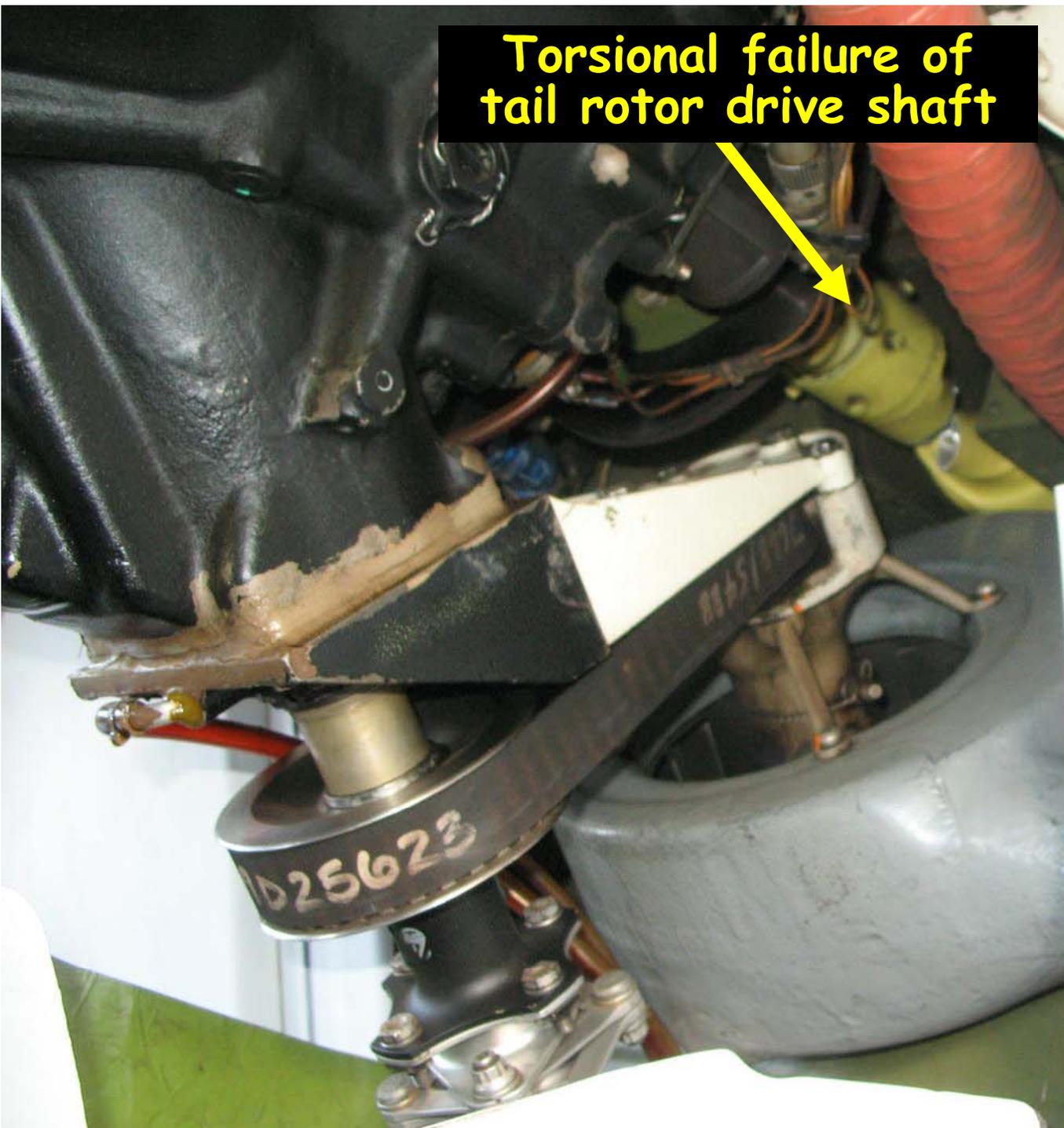








**Torsional failure of  
tail rotor drive shaft**



**No visible damage to fuselage**



**No visible damage  
to tail rotor blades**



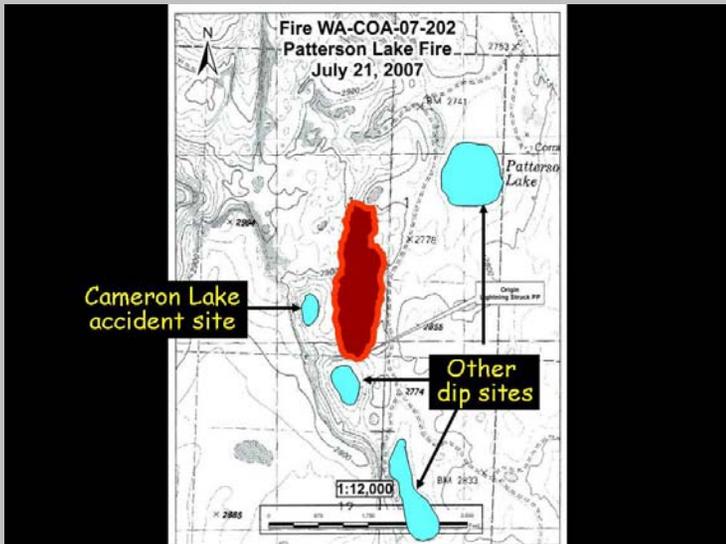


# AM Observations Omak, WA, July 21, 2007



## Discussion

- Basic airmanship (rate of closure, flare, and rate of descent)
- Decision making (selection of dip site and approach technique)
- Unnecessary risk-taking
- Dip site supervision
- Previous observations of pilot performance





# Bethel, AK

August 8, 2007



Cessna 185F  
(Float equipped)

Mission

Ferry Flight

Damage

Substantial

Injuries

1 Serious Injury

Procurement

Fleet

NTSB ID

ANC07LA077





# *Bethel, AK*

## *August 8, 2007*

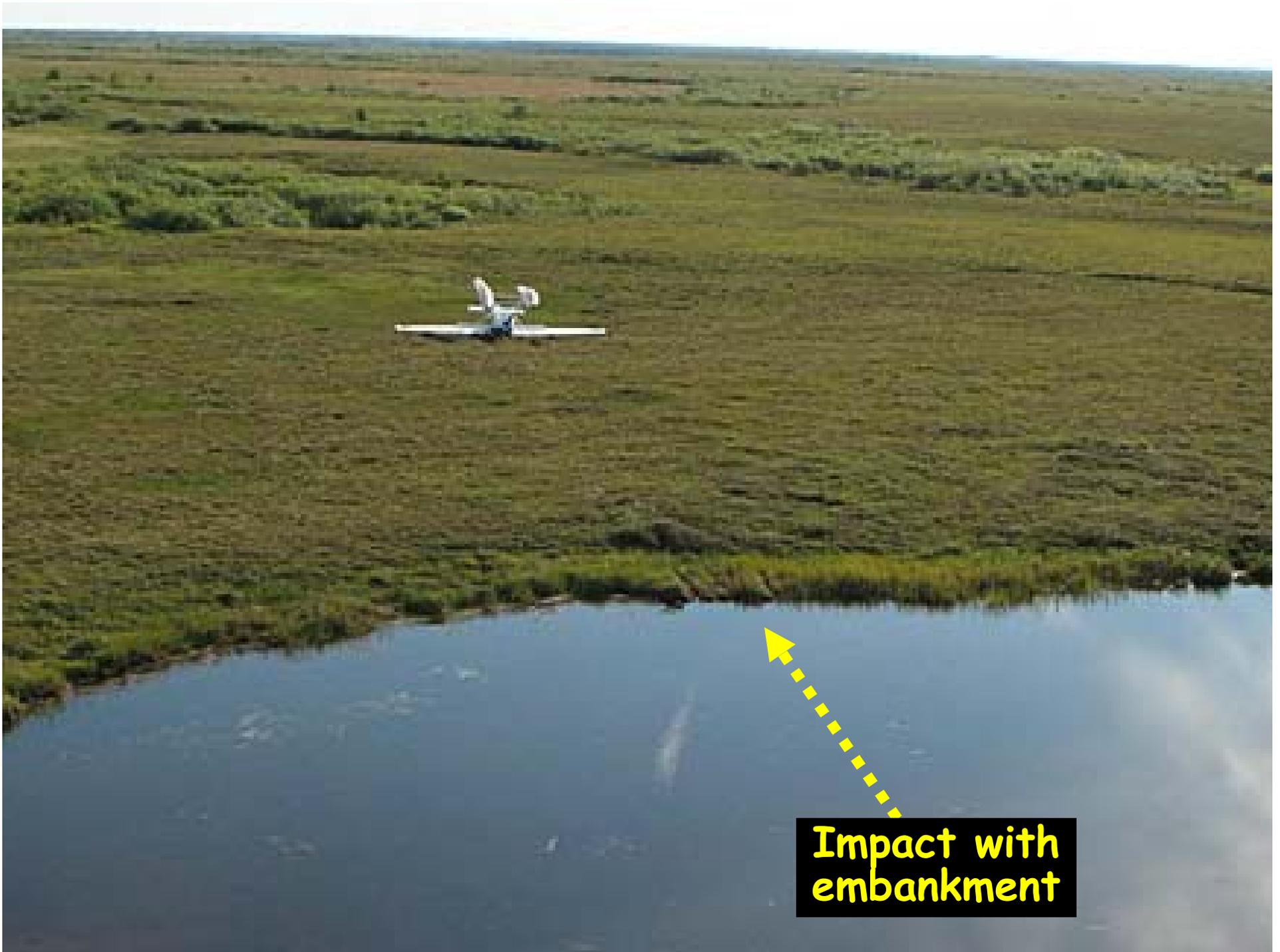


### NTSB Probable Cause.

**The commercial pilot was repositioning a float-equipped airplane to its mooring site after a 100-hour inspection. About 2 minutes after departure, the pilot reported a loss of engine power, and selected a small pond as a forced landing site. After touchdown on the pond, the airplane collided with the shoreline and nosed over. The airplane sustained substantial damage to the left wing, right wing lift strut, empennage, and fuselage. A postaccident inspection of the airplane revealed that the fuel selector handle had been inadvertently reinstalled incorrectly during the recent 100-hour inspection, and when the fuel tank selector handle was placed in the "Both" position, it actually turned the fuel supply off. Investigation revealed slight wear to the keyed cog of the fuel selector valve handle (female receptacle), as well as slight wear to the fuel selector valve connection point (male receptacle). The combined wear patterns of both the fuel selector valve handle and the fuel selector valve connection point allowed the installation of the fuel selector handle 180 degrees from its correct position. When a new fuel selector valve handle was fitted onto the valve connection point, it could only be installed in the correct position, and not 180 degrees from the correct installation.**

**The National Transportation Safety Board determines the probable cause(s) of this accident as follows: The improper [reversed] installation of the fuel selector handle by maintenance personnel.**





**Impact with  
embankment**

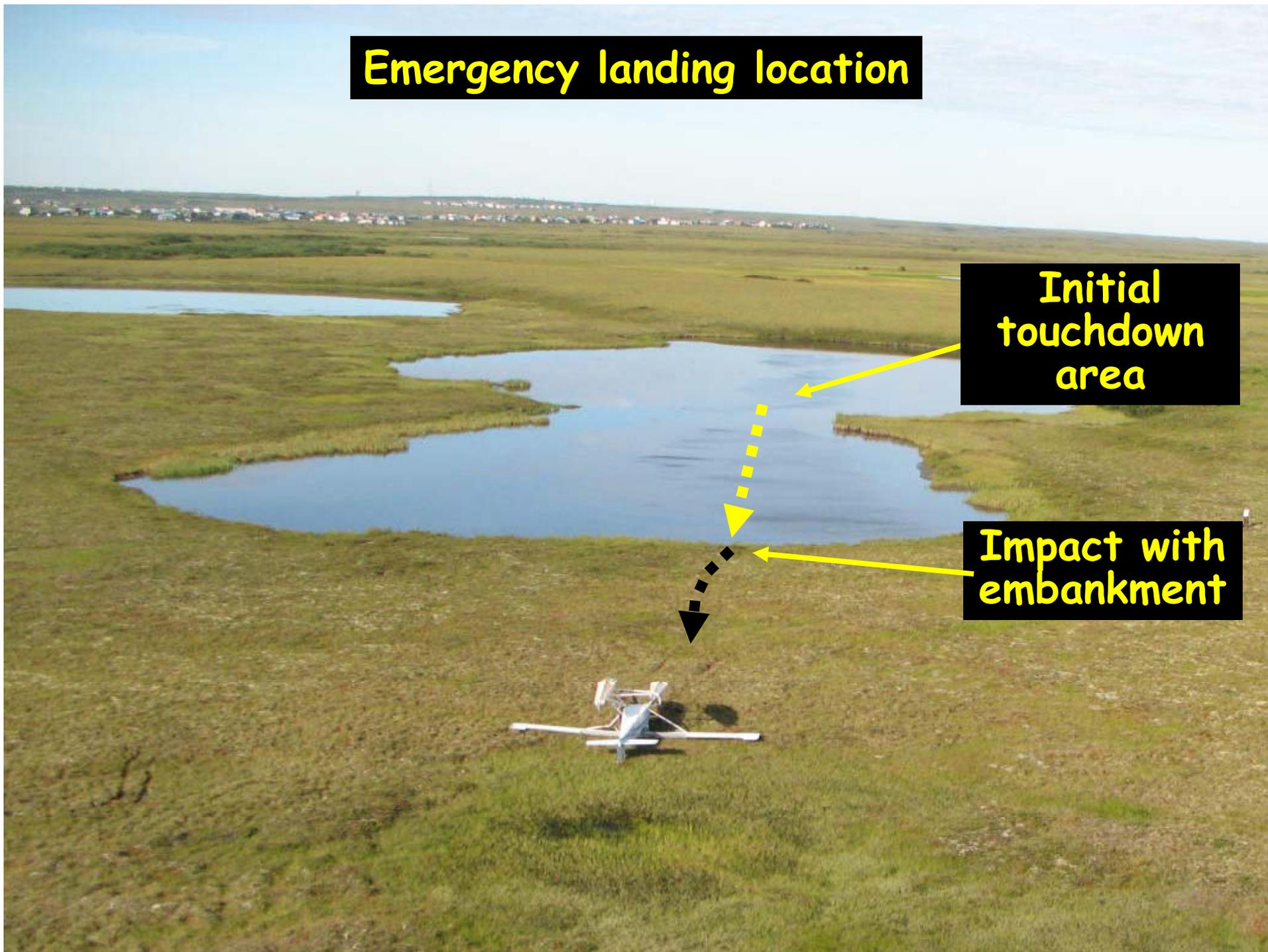


**Impact with embankment**

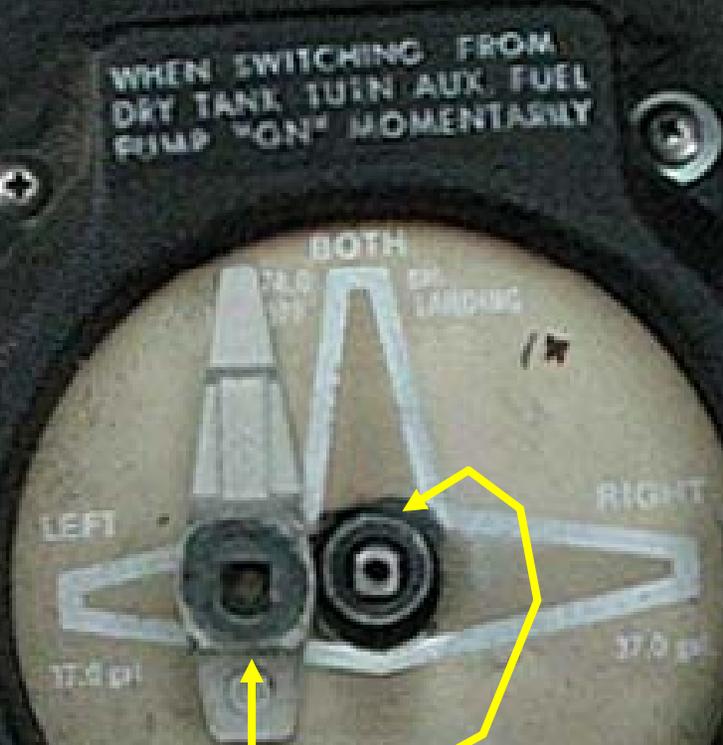
# Emergency landing location

Initial  
touchdown  
area

Impact with  
embankment



**Fuel Selector Valve  
(as installed)**



**Note three straight  
and one curved side**





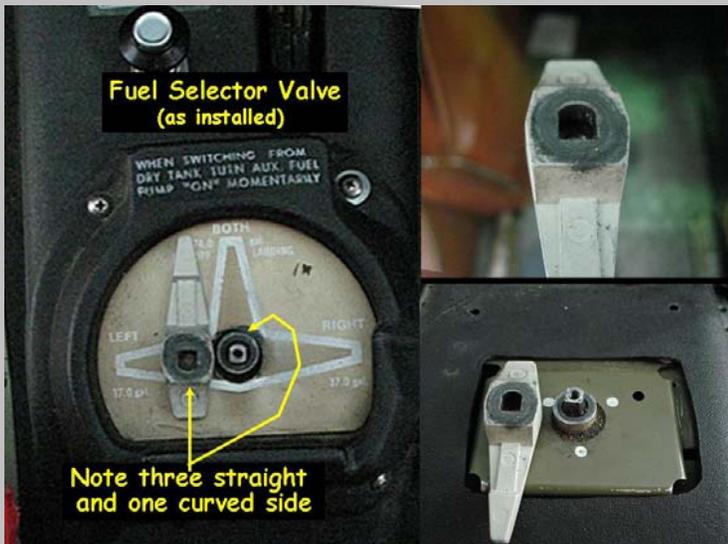
# AM Observations

## Bethel, AK, August 8, 2007



### Discussion

- CRM for mechanics (teamwork, communications)
- Use of maintenance manuals and checklists
- Forced landing areas
- Altitude, altitude, altitude





# Aberdeen, SD

August 8, 2007



Cessna 172

*Incident with Potential*

Mission

Easement Survey

Damage

Minor

Injuries

None

Procurement

ARA

NTSB ID

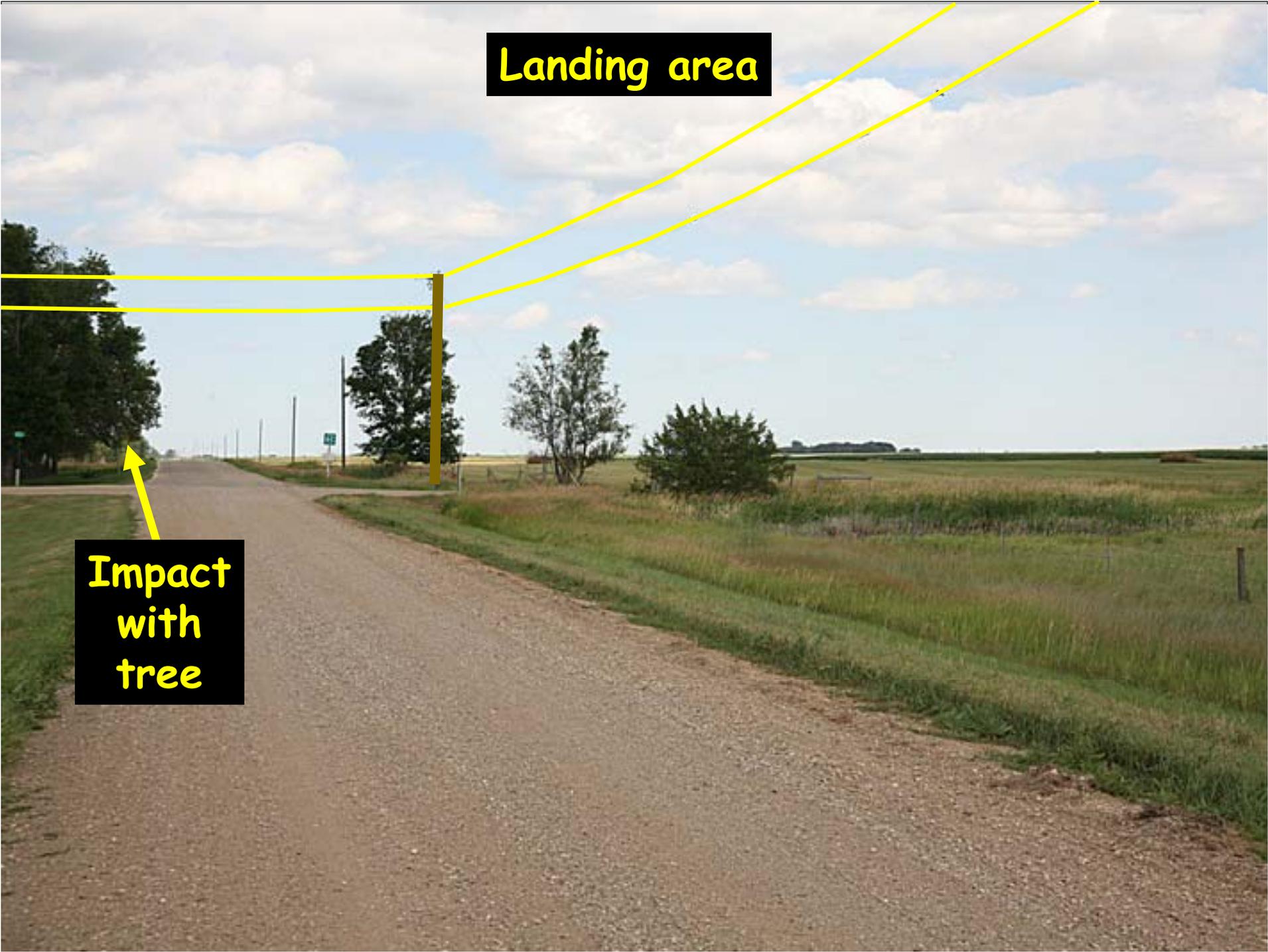
NA





**Landing area**

**Impact with tree**





**Impact  
with  
tree**

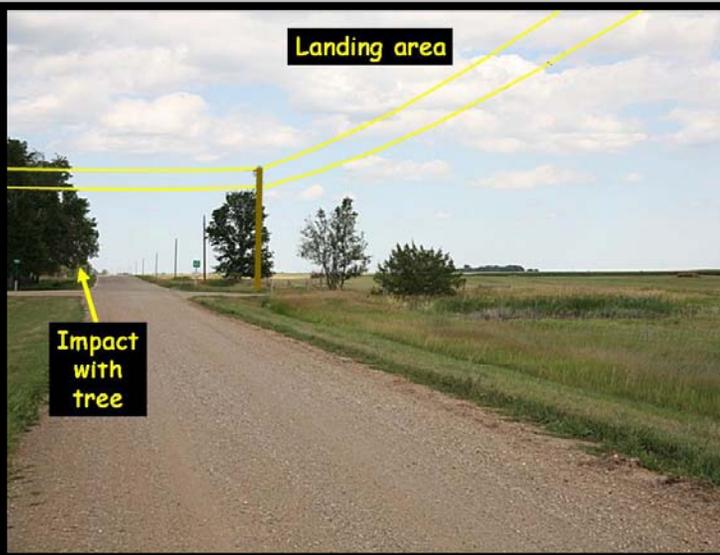






# AM Observations

## Aberdeen, SD, July 11, 2007



### Discussion

- Pilot carding (vendor failure, Government employee failure)
- Pre-mission planning (pre-flight inspection, fuel quantity)
- Pilot decision making (CRM, fuel management, reaction to emergency, downwind landing, most conservative response rule)
- Dip the tanks and take more than the minimum (when the situation permits)