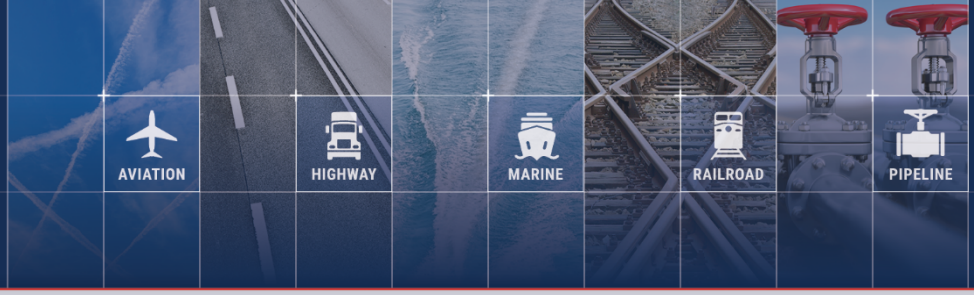

Aviation Investigation Final Report

Location:	MORGANTON, North Carolina	**Accident Number:**	ATL98GA086
Date & Time:	June 25, 1998, 12:37 Local	**Registration:**	N16574
Aircraft:	Ector Aircraft Company 305A (L-19)	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Public aircraft		

Analysis

According to the pilot, he was flying above a fire as a spotter for the U. S. Forest Service (USFS), although he was employed by the North Carolina Forest Service (NCFS). The fire was on a mountain which lies in a north-south direction. The winds were westerly. He began by flying approximately 600-800 feet above the ridge. After completing several circuits, the pilot stated the air became turbulent, so he climbed 1000 feet. After completing several circuits at the new altitude, the pilot decided to reverse directions and fly a clockwise pattern. He flew away from the mountain on the leeward side and made a 180 degree turn. As he completed the turn, the airplane began to lose altitude rapidly. The pilot stated he added full power and leveled the wings, but he was still descending in excess of 500 feet per minute, with his airspeed decreasing through 80 miles per hour (mph). He then started a right turn to clear the ridge, but he was already below the ridge line. The pilot stated the controls became mushy and unresponsive. He stated he then attempted to make a 'controlled crash'. The pilot reported no problems with the airplane or engine. The pilot reported having approximately 4 1/2 years mountain flying experience while in Alaska, but no formal training in mountain flying. The airplane stalls at 47 mph when in level flight with no flaps. NCFS pilots reported that they have no regulations, handbook, or guidelines for use when flying.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The inflight encounter with a downdraft which led to a stall/mush and an inflight collision with the ground. Factors were the inadequate training in mountain flying and inadequate guidelines provided by the North Carolina Forest Service.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: MANEUVERING

Findings
1. (C) WEATHER CONDITION - DOWNDRAFT
2. (F) MATERIAL INADEQUATE - COMPANY/OPERATOR MANAGEMENT
3. (F) INADEQUATE TRAINING - COMPANY/OPERATOR MANAGEMENT

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. (C) STALL/MUSH - ENCOUNTERED - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On June 25, 1998, about 1237 eastern daylight time, an Ector-Cessna 305A (L-19), N16574, collided with trees while circling over a fire zone in mountainous terrain near Morganton, North Carolina. The airplane was owned by the State of North Carolina Forest Service and operated by the commercial pilot, an employee. Visual meteorological conditions prevailed and no flight plan was filed for the local flight. The pilot and sole occupant was not injured, and the airplane sustained substantial damage. The flight had originated from Morganton, North Carolina about 1200.

According to the pilot, he was flying above the "Deal's Creek" fire as a spotter for the U. S. Forest Service (USFS). The fire was about halfway to the top of the ridge of Bald Knob mountain which lies in a generally north-south direction. He began by flying approximately 600-800 feet above the top of the ridge in a counterclockwise pattern. After completing several circuits, the pilot stated the air became turbulent, so he climbed to approximately 1600-1800 feet above the ridge. After completing several circuits at the new altitude, the pilot stated he decided to reverse directions and fly in a clockwise pattern. He flew away from the mountain on the leeward side and made a 180 degree turn. As he turned back towards the mountain, the airplane began to lose altitude rapidly. The pilot stated he added full power and leveled the wings, but he was still descending in excess of 500 feet per minute, with his airspeed decreasing through 80 miles per hour (mph). He then started a right turn to clear the ridge, but he was already below the ridge line. The pilot stated the controls became mushy and unresponsive. He stated he then slowed the airplane down, with full flaps, and attempted to make a "controlled crash". The pilot reported no problems with the airplane or engine.

PERSONNEL INFORMATION

The pilot held a commercial pilot certificate with single engine land, single engine sea, instrument airplane, and multiengine land ratings. He was also a certified flight instructor with single engine airplane, multiengine airplane, instrument airplane, and ground instructor ratings. His certificate was issued September 26, 1991. His last medical, a second class, was issued August 1, 1997, and it contained no limitations or waivers. The pilot had a flight review on December 2, 1996. The pilot reported having approximately 4 1/2 years mountain flying experience while in Alaska, but no formal training in mountain flying.

Additional information about the pilot is contained on page 3 under the heading First Pilot Information.

AIRCRAFT INFORMATION

The airplane and engine records were inspected and showed no discrepancies. All applicable Airworthiness Directives had been complied with, according to the airplane records. The last inspection of the airplane, an annual, was completed January 9, 1998. The engine was also annually inspected on that day. According to the Pilot Operating Handbook, the airplane stalls at 47 mph when in level flight with no flaps at 2000 pounds. With full flaps, the airplane stalls at 43 mph.

Additional information about the aircraft is contained on page 2 under the section titled Aircraft Information.

METEOROLOGICAL INFORMATION

The weather at the time of the accident was visual meteorological conditions. The reported winds in Asheville were variable at 5 knots. The pilot reported the winds at the accident site were westerly. Additional information about the weather is contained under the section titled Weather Information.

WRECKAGE AND IMPACT INFORMATION

When investigators arrived at the scene, the airplane was resting on the landing gear. The surrounding terrain sloped upward approximately 30 degrees, with the right wing on the high side. The wreckage was found together, facing 248 degrees. The surrounding terrain was mountainous with dense underbrush and a thick tree canopy. The accident site was at a latitude of North 35 degrees, 47 minutes, and 7 seconds, and a longitude of West 81 degrees, 58 minutes, and 3 seconds. The approximate altitude of the accident site was 3200 feet. Two trees directly in front of both wings showed 3 separate areas of freshly scarred bark at approximate heights of 20 feet, 15 feet, and 10 feet.

The right wing had a circular indentation in the leading edge of the wing just inboard of the wing tip. There were also circular indentations in the leading edge at the midpoint of the wing and above the strut attachment point.

One propeller blade was twisted slightly, and the tip was curled about 90 degrees, so it pointed aft. The opposing blade had chordwise scrapes across the face.

The left wing was detached from the fuselage at the wing attachment point. There was a circular indentation in the leading edge of the wing at the strut attachment point. At the strut attachment point, the rivet line was pulled out, and there was spanwise crushing outboard to the landing light. The left wing was also fractured 1/4 of the way from the root, and the tip was folded down and back 30 degrees.

The empennage had two circular indentations in the leading edge of the right horizontal stabilizer; one 6 inches from the root and one 2/3 of the way to the tip. The right elevator was

fractured one foot inboard of the tip.

The cockpit windshield and roof windows were shattered. The left and right rear windows were both cracked. The inboard corners of both wing flaps were inside the window frames.

MEDICAL AND PATHOLOGICAL INFORMATION

The pilot was not injured in the accident.

ADDITIONAL INFORMATION

The fire was burning on Federal land, so it was considered the U.S. Forest Service's (USFS) responsibility. But, the North Carolina Forest Service (NCFS) had a cooperative agreement with the USFS to assist them in the fighting of fires. As part of the cooperative agreement, the NCFS had to comply with the regulations of the USFS. The U.S. Forest Service required that a pilot maintain at least 500 feet above the ground except for during takeoff and landing, and they recommended that an observer be present to watch the fire, while the pilot flies the airplane. The USFS also stated that in Region 8, where the accident occurred, there is a 1,000 foot minimum descent altitude. Also, the USFS required pilots to have an initial checkride which includes the demonstration of in-flight skills for maneuvering in mountainous terrain and knowledge of typical mountain weather conditions. They also required recurrent training. The U.S. Forest Service also described the dangers and techniques associated with mountain flying in their Fixed Wing Operations Handbook, which was distributed to all its pilots. The handbook also listed training items to be covered, which included mountain flying.

According to the North Carolina Forest Service, a pilot with prior mountain flying experience will receive no initial or recurrent training in mountain flying. He will receive one comprehensive "checkout" flight with the state chief pilot at the time he is hired. After being employed by the NCFS, a pilot receives one training session a year, which primarily deals with how to spot a fire and communicate with fire fighters. He will also fly a proficiency checkride annually. The North Carolina Forest Service has a draft version of the new Aviation Policy and Procedure Manual. The draft manual states all flights below 500 feet should be conducted under Title 14 CFR Part 137 regulations. It does not specify a minimum altitude for flight operations. The draft manual also states that pilots should receive "regular" training to include aircraft checkout and familiarization. The current manual in use also does not specify minimum altitudes or training programs. It does state that a pilot should have a checkride once a year. Neither manual states that an observer should be present during fire reconnaissance, and according to North Carolina pilots, it is unusual to utilize an observer. North Carolina pilots reported that they have no handbook or guidelines for use when flying. They also stated they have never seen the USFS's Fixed Wing Operations Handbook.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	57,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	August 1, 1997
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	7683 hours (Total, all aircraft), 276 hours (Total, this make and model), 7361 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 69 hours (Last 30 days, all aircraft), 10 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Ector Aircraft Company	**Registration:**	N16574
Model/Series:	305A (L-19) 305A (L-19	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	2019
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	January 9, 1998 Annual	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:	97 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4156 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, aided in locating accident	**Engine Model/Series:**	O-470-11B
Registered Owner:	STATE OF NORTH CAROLINA	**Rated Power:**	213 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:	NC FOREST SERVICE	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	AVL ,2165 ft msl	**Distance from Accident Site:**	50 Nautical Miles
Observation Time:	11:54 Local	**Direction from Accident Site:**	260°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	0°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	29°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	MORGANTON , NC (MRN)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	12:00 Local	**Type of Airspace:**	Class G

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	35.639141,-78.449218(est)

Administrative Information

Investigator In Charge (IIC):	Wilson, Butch
Additional Participating Persons:	JOHN CROUSE; JAMES M MORRISON; THOMAS C THOMPSON; REGAN H CAMPBELL;
Original Publish Date:	February 15, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=3935