Aviation Investigation Final Report

Location:	Falmouth, Massachusetts	**Accident Number:**	ERA23FA077
Date & Time:	December 2, 2022, 15:04 Local	**Registration:**	N3515H
Aircraft:	Mooney M20J	**Aircraft Damage:**	Substantial
Defining Event:	Collision during takeoff/land	**Injuries:**	1 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot-rated passenger described the sun as “blinding” during the landing approach, but stated that she and the pilot were uncomfortable landing on the other runway due to the wind conditions. While on final approach, the passenger adjusted the pilot’s sun visor, then looked down to confirm that the airplane was properly configured for landing. When she looked up, she knew that the airplane was going to impact trees. Examination of the wreckage revealed that the airplane impacted 75-ft-tall trees about 300 ft from the end of the runway, then subsequently impacted terrain. The passenger reported there were no mechanical malfunctions or anomalies that would have precluded normal operation. Review of published airport information revealed that trees were listed as an obstruction for both runways.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot’s failure to maintain clearance from trees during the landing approach. Contributing to the accident was the sun glare, which impaired the pilot's visibility and situational awareness.

Findings

Environmental issues	Glare - Effect on personnel
Environmental issues	Tree(s) - Contributed to outcome
Aircraft	Altitude - Not attained/maintained
Personnel issues	Aircraft control - Pilot

Factual Information

History of Flight

Approach-VFR pattern final	Collision during takeoff/land (Defining event)

On December 2, 2022, about 1504 eastern standard time, a Mooney M20J, N3515H, sustained substantial damage when it was involved in an accident at Falmouth Airpark (5B6), Falmouth, Massachusetts. The private pilot was fatally injured, and the pilot-rated passenger received serious injuries. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to a friend of the pilot, earlier that day, he and three other aircraft, including the accident airplane, flew from 5B6 to Westfield-Barnes Regional Airport (BAF), Westfield/Springfield, Massachusetts, for lunch. He reported that, after having lunch, they all returned to 5B6. Before landing, he heard a female voice making radio calls from the accident airplane. She made an announcement as they were entering the downwind leg of the airport traffic pattern and then onto the final leg for runway 25. He continued his approach and while on short final, he spotted the crashed airplane at the approach end of runway 25.

In an interview with the pilot-rated passenger, she remembered flying to BAF, and said that the flight was uneventful. She was not pilot-in-command at the time of the accident but was double-checking everything during the flight. She reported that the sun was “blinding” during the approach to runway 25, but there was enough wind that they did not feel comfortable landing on runway 7. While on short final, she adjusted the pilot’s sun visor, looked down to check that the airplane was configured for landing, and when she looked up, she knew that the airplane was going to hit the trees. She believed that the pilot could not see because of the sun. She stated that the engine was running fine, and there were no flight control anomalies at the time of the accident.

Pilot Information

Certificate:	Private	**Age:**	83,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	BasicMed	**Last FAA Medical Exam:**	October 1, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 2659 hours (Total, all aircraft), 2659 hours (Total, this make and model)		

Pilot-rated passenger Information

Certificate:	Commercial; Flight instructor	**Age:**	70,Female
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	April 1, 2021
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 2516 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Mooney	**Registration:**	N3515H
Model/Series:	M20J No Series Exists	**Aircraft Category:**	Airplane
Year of Manufacture:	1980	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	24-1034
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	July 24, 2022 Annual	**Certified Max Gross Wt.:**	2740 lbs
Time Since Last Inspection:	28.2 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2774.87 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	C91 installed, not activated	**Engine Model/Series:**	IO-550
Registered Owner:	On file	**Rated Power:**	300 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KFMH,130 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	20:45 Local	**Direction from Accident Site:**	13°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.5 inches Hg	**Temperature/Dew Point:**	7°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Westfield/Springfield, MA (BAF)	**Type of Flight Plan Filed:**	None
Destination:	Falmouth, MA	**Type of Clearance:**	None
Departure Time:	14:23 Local	**Type of Airspace:**	Class G

A review of the sun's azimuth/angle indicated that the sun was directly in front of the airplane during the approach.

Airport Information

Airport:	Falmouth Airpark 5B6	**Runway Surface Type:**	Asphalt
Airport Elevation:	41 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	25	**IFR Approach:**	None
Runway Length/Width:	2298 ft / 40 ft	**VFR Approach/Landing:**	Full stop

A review of the Airport Facility Directory for 5B6 indicated that trees were located 300 ft from the threshold of runway 25 and about 125 ft right of the runway centerline. A 4:1 approach glide slope was necessary to clear these trees. According to the airport manager, “MassDOT conducts annual inspections, which generally go well, but the trees are consistently noted as a concern. The trees have been trimmed back as much as possible within the property boundaries.” The trees near runway 25 were predominantly pines and oaks, with heights ranging from 50 to 100 ft.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Fatal, 1 Serious	**Latitude, Longitude:**	41.5879,-70.536505(est)

The airplane impacted 75-ft-tall trees and came to rest 200 ft from the runway 25 threshold. Two impact craters were observed; both craters contained clear and green plexiglass, consistent with impact from the right wing. This was followed by a 10-ft ground scar that ended with a 2-ft-deep crater. All major components of the airplane were located at the accident site. The fuselage from the firewall to the empennage was crushed and impact damaged. The instrument panel and cockpit were destroyed by impact forces. Engine and propeller controls were full forward; the engine was partially separated from the firewall. Flight controls within cockpit were impact damaged but remained connected to the flight control push/pull tubes throughout the fuselage. Flight control continuity was established to all flight control surfaces. The empennage remained intact, and the horizontal stabilizers, elevators, vertical stabilizer, and rudder remained attached and were unremarkable.

Flight recorders

The airplane was equipped with an Appareo Stratus PRX V2, and its data were successfully downloaded by the NTSB Recorder Specialist using the manufacturer's procedures. The Appareo Stratus is a self-contained, battery-powered device that incorporates an internal attitude and heading reference system (AHRS), a GPS/WAAS receiver, and an ADS-B receiver. A review of the tabular data retrieved from the device indicated that the airplane was at an altitude about 100 ft mean sea level (msl) as it approached the trees, corresponding to about 59 ft above ground level.

Medical and Pathological Information

An autopsy of the pilot was performed by The Commonwealth of Massachusetts, Office of the Chief Medical Examiner. According to the autopsy report, the cause of death was blunt force injuries, and the manner of death was accident.

Toxicology testing performed at the FAA Forensic Sciences Laboratory found no drugs of abuse. Tamsulosin was detected in the blood and urine and is a prescription medication commonly used to treat symptoms of an enlarged prostate. Tamsulosin is not generally considered impairing.

Preventing Similar Accidents

Stabilized Approaches Lead to Safe Landings (SA-077)

The Problem

Failing to establish and maintain a stabilized approach, or continuing an unstabilized approach, could lead to landing too fast or too far down the runway, potentially resulting in a runway excursion, loss of control, or collision with terrain. Regardless of the type of aircraft, the level of pilot experience, or whether the flight is being conducted under instrument flight rules or visual flight rules, a stabilized approach is key to maintaining control of the aircraft and ensuring a safe landing.

What can you do?

- Follow SOPs and industry best practices for stabilized approach criteria, including a normal glidepath, specified airspeed and descent rate, landing configuration (flaps, gear, etc.), appropriate power setting, landing checklists, and a heading that ensures only small changes are necessary to maintain runway alignment. Guidance and tips (see the "Interested in more information?" section) indicate that, in most cases, the approach should be stabilized by 1,000 ft in instrument conditions or 500 ft in visual conditions. If the approach becomes unstabilized at any time after that, go around.
- Practice go-arounds and missed approaches so that you are comfortable with the procedures when needed. Remember to establish personal minimums for all types of operations, including go-arounds and missed approaches.
- Use effective single-pilot resource management or crew resource management. A stabilized approach begins with an effective approach briefing. Ensure that you understand critical aspects of the approach, such as the minimum safe altitude, hazards, approach conditions, and missed approach procedures.
- Do not allow perceived operational pressures (for example, from air traffic controllers, passengers, etc.), continuation bias, or last-minute runway changes to influence your decision to execute a go-around; if your approach is not stabilized, go around.
- Never attempt to "save" an unstabilized approach. If the approach becomes unstabilized, conduct an immediate go-around. Remember, when two pilots are on duty, either crewmember may call for a go-around at any time.

See https://www.ntsb.gov/Advocacy/safety-alerts/Documents/SA-077.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric
Additional Participating Persons:	Christi Cushing; FAA/FSDO; Burlington, MA Daniel J. Ballou; FAA/FSDO; Burlington, MA
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