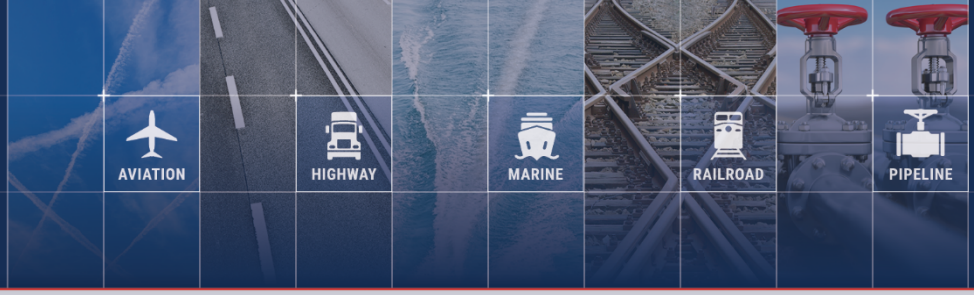


Aviation Investigation Final Report

Location:	Ft. Lauderdale, Florida	**Accident Number:**	ERA09FA080
Date & Time:	December 6, 2008, 16:30 Local	**Registration:**	N118TP
Aircraft:	Piper PA-44-180	**Aircraft Damage:**	Substantial
Defining Event:	Midair collision	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

A Cessna and Piper were both on instructional flights, operating in a concentrated flight training area that is depicted on a sectional chart. There was no air-to-ground communication in the area, but there was an advisory frequency that was used by the flight schools in the area. The Cessna's pilot reported that he was "...a Cessna 172 holding at FRDDY at 2000 feet." No other radio transmissions were heard from the Cessna, and there were no reports of any radio transmissions from the Piper. Radar information indicated that the Cessna was on a 210-degree course and was tracking at a speed of 86 knots. The Piper was on a course of 160 degrees and was tracking at a speed of 126 knots. Both airplanes converged on the same position, and the collision occurred at about 2,000 feet above ground level. The reported weather about the time of the accident included clear skies and visibility of 10 miles.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of both pilots to see and avoid the other aircraft.

Findings

Personnel issues	Monitoring other aircraft - Pilot
Personnel issues	Monitoring other aircraft - Pilot of other aircraft

Factual Information

History of Flight

Maneuvering	Midair collision (Defining event)

"THIS CASE WAS MODIFIED MAY 19, 2009."

HISTORY OF FLIGHT

On December 6, 2008, about 1630 eastern standard time, a Piper PA-44-180, N118TP, and a Cessna 172R, N369ES, collided in midair about 18 miles west of the Ft. Lauderdale Hollywood International Airport (FLL), Ft. Lauderdale, Florida. N118TP was owned by Airline Transport Professionals Corp of USA and was being operated under visual flight rules (VFR) as an instructional flight. N369ES was owned by Pelican Flight School and was being operated as a VFR instructional flight. Both airplanes were substantially damaged. The certified flight instructor (CFI) and the certificated commercial pilot aboard N118TP were both killed. The certified flight instructor and the certificated private pilot aboard N369ES were also killed. Both airplanes were operated under Title 14 Code of Federal Regulations (CFR) Part 91. Visual meteorological conditions prevailed at the time of the accident.

Both airplanes were operating in the A-291B concentrated flight training area prior to the time of the accident. This area is depicted on the Miami sectional chart as (A- Alert) special use airspace. A-291B is in operation from 0600 to 2400. The flight altitude for this area is 0 to 3900 feet above ground level (agl), and there is no air to ground communications provided in this area.

According to the owner of Pelican Flight School, the purpose of the Cessna's flight was to practice flight maneuvers prior to the private pilot taking his instrument checkride. Other instructors at the school stated that they heard their flight instructor in the concentrated flight training area A-291B, over frequency 123.45 making position reports. This is a frequency used by the flight schools in the local area when operating in A-291B; flight instructors often use this training area for students. They recalled that the Cessna's pilot reported that he was "North Perry training area, this is a Cessna 172 holding at FRDDY at 2000 feet." No other radio transmissions were heard from the Cessna.

According to the Airline Transport Pilot flight school personnel, the purpose of the Piper's training flight was to train the commercial rated pilot for his multiengine instructor certificate. Based on a report from the Airline Transport Pilot flight school, the airplane departed FLL to conduct a local training flight. There have been no reports of any radio transmissions from the Piper, while in the training area A-291B. According to instructors at the Airline Transport Pilot flight school they were familiar with the 123.45 frequency.

Radar information provided by Federal Aviation Administration (FAA) Air Traffic Control (ATC) personnel indicates that the Cessna was on a 210-degree course magnetic, and was tracking at a speed of 86 knots. The Piper was on a course of 160 degrees magnetic, and was tracking at a speed of 126 knots. Both airplanes converged on the same position, and the collision occurred at about 2,000 feet above ground level (agl), north of the FRDDY intersection.

PERSONNEL INFORMATION

Pilots of N369ES

CFI (right seat)

The instructor in N369ES, age 25, held a certified flight instructor certificate, with ratings for airplane single-engine land, airplane multiengine land, and instrument airplane. His certificate was issued on July 7, 2007. He held a first-class medical certificate issued on March 19, 2008. At the time of the accident, he was employed by Pelican Flight School as a flight instructor. The pilot indicated on his last application for the first-class medical certificate that he had accumulated 816 total flight hours.

Pilot receiving instruction (left seat)

The pilot receiving instruction, age 30, held a private pilot certificate, with a rating for airplane single-engine land. His certificate was issued on January 18, 2002. He held a second-class medical certificate issued on August 22, 2006. A review of the pilot's logbook disclosed that he had logged 179 total flight hours.

Pilots of N118TP

CFI (left seat)

The instructor in N118TP, age 21, held a certified flight instructor certificate, with ratings for airplane single-engine land, airplane multiengine land, and instrument airplane. His certificate was issued on November 10, 2007. He held a first-class medical certificate issued on December 6, 2007. A review of the pilot's logbook disclosed that he had logged 920 total flight hours. At the time of the accident, the certified flight instructor was employed by Airline Transport Pilot flight school as a flight instructor.

Pilot receiving instruction (right seat)

The pilot receiving instruction, age 37, held a certified flight instructor certificate, with ratings for airplane single-engine airplane land and instrument airplane. His certificate was issued on April 28, 2006. He held a second-class medical certificate issued on December 11, 2006. The

pilot indicated on his last application for the second-class medical certificate that he had accumulated 1,156 total flight hours.

AIRCRAFT INFORMATION

Cessna 172R

The airplane was manufactured in 1997 as a four-seat, high-wing airplane with fixed tricycle landing gear and powered by a Lycoming IO-360-L2A, 160-horsepower engine. Review of the aircraft logbook disclosed that an annual inspection was conducted on September 2, 2008, at a tachometer time of 3,182.1 hours. The last 100-hour inspection was conducted on November 6, 2008, at a tachometer time of 3,273.5 hours.

Piper PA-44-180

The airplane was manufactured in 1979 as a four-seat, low-wing airplane with retractable tricycle landing gear and powered by a Lycoming LO-360-F1A6D, 180-horsepower engine on the right side. The left side engine was an O-360-E1A6D, 180-horsepower engine. Review of the aircraft logbook disclosed that an annual inspection was conducted on November 28, 2008, at a tachometer time of 7,719.4 hours.

METEOROLOGICAL INFORMATION

The reported weather at North Perry Airport, located about 5 miles east of the accident site, at 1553, was: wind from 230 degrees at 11 knots; visibility 10 miles; sky clear; temperature 26 degrees Celsius; dew point 16 degrees Celsius; altimeter 30.03 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The Cessna airplane came to rest inverted in approximately 3 feet of water in the Everglades National Park. The right wing had separated and was located approximately 100 feet east of the main wreckage. The Piper also came to rest in approximately 3 feet of water in the park. Both airplanes were located approximately 18 miles west of FLL. The distance between both airplanes was 2,463 feet. The Cessna was on a 229-degree magnetic bearing, and the Piper was on a magnetic bearing of 140 degrees.

Cessna 172R

Examination of the Cessna disclosed that it had numerous paint transfer marks. The left side of the fuselage had several marks just aft of the cabin door. The vertical stabilizer leading edge had blue and red transfer marks approximately 3 feet in length, from the base toward mid-span. The right wing leading edge had red transfer marks near the tip. The Piper was painted a white base, with red and blue stripes and a solid blue tail.

The fuselage was substantially damaged by impact with the terrain. The firewall was pushed aft into the cockpit. The door frames and cabin skins were buckled. The empennage was bent over to the right, approximately 90 degrees. The instrument panel was fragmented. No instruments or avionics were observed. The circuit breakers centers were missing. The nose gear piston and barrel were straight. The top of the barrel was bent just below the upper attach fitting.

All flight controls were found attached or partially attached to their joining surfaces. The left elevator weight was damaged and separated. Flight control cable continuity was confirmed. Several cables were separated and exhibited a condition consistent with tension overload. The left wing remained partially attached to the fuselage and exhibited leading edge compression damage to its full length. The wing strut was damaged and separated from the fuselage. The main landing gear was still attached to the fuselage and impact damaged. The right wing was mostly intact, with a diagonal crease forward of the aileron. The right wing root also exhibited damage. The wing strut separated inboard of mid-span, with both ends connected to their respective attachment points. The vertical stabilizer leading edge was crushed approximately 8 inches aft, approximately mid-span.

Examination of the engine disclosed it was impact damaged. The engine was partially disassembled for examination. The top forward section of the engine case halves were impact damaged. The top spark plugs were removed, and the cylinders contained water and dirt from the marsh. The valve covers were removed, and water and dirt from the marsh were observed in the cylinder heads. The oil sump was impact damaged and was separated from the engine. Both magnetos were impact damaged and partially separated from the accessory housing. The vacuum pump was still connected to the accessory housing, and was removed for examination. The vacuum pump coupling was still intact, but the pump was impact damaged. The propeller and spacer separated from the crankshaft propeller attach flange. The propeller attaching bolts were bent over nearly 90 degrees. Blade A was bent aft approximately 160 degrees. The leading edge tip had gouge marks. Blade B was twisted in the direction of rotation and bent aft approximately 45 degrees. The outboard 5 inches of the tip was not recovered.

Piper PA-44-180

Examination of the Piper disclosed that the fuselage was fragmented throughout the sidewalls, cabin roof, and floor. The instrument panel area was crushed and did not contain any flight instruments. The cockpit section contained the rudder pedals, the copilot control wheel, and the pilot's control wheel. All instruments and avionics equipment were impact damaged. The forward nose section contained the nose gear assembly, which was in the up and locked position. There were two transponders recovered from the airplane. One was set to code 1200 and was in the altitude mode. The other transponder was set to 2000, and in the off position.

Examination of the right wing disclosed that the nacelle was separated from the wing main spar. Leading edge skins were separated from the main spar from root to tip. The main spar

was bent and twisted from the root stub spar to the wing tip. Control cable continuity was observed to the aileron bell-crank. The bell-crank was bent, twisted and damaged. The aileron cables at the wing root exhibited a condition consistent with tension overload. The nacelle fuel tank bladder was breached and separated from the nacelle. The nacelle forward skins were breached. The main landing gear assembly was down but not locked, and its hydraulic actuator cylinder was impact damaged. The engine with mount was detached from the nacelle.
Examination of the left wing disclosed that it was separated from the fuselage structure and consisted of approximately 7 feet of the inboard section, with approximately 7 feet of flap attached by its inboard wing spar attach hinge. The main spar and adjoining leading edge skins were missing from the outboard flap hinge to the wing tip. The nacelle and the fuel cell were breached. The main landing gear was detached from the wing spar mounts and exhibited impact damage. The engine with mount was detached from the nacelle.

Examination of the left stabilizer exhibited leading edge compression and was bent upward approximately 60 degrees. The right stabilizer leading edge exhibited downward bending with the skin seams split.

The vertical stabilizer exhibited leading edge impact damage and accordion crushing 4 feet from its fuselage attachment point. The rudder was partially attached to the vertical stabilizer by the hinges. Control cable continuity was established for stabilator and rudder and trim tabs at the separated tail cone to the controls. All flight control surfaces were located at the wreckage site and impact damaged, and all flight control cable separation points were consistent with overload.

The left and right engines were separated from their respective nacelles and exhibited impact damage with a case breach condition and damage to various accessories. Both propellers exhibited blade bending and other damage. Engine power control continuity was partially traced due to separation of wings and engines from nacelles. Damage was noted on all viewed engine controls. The power lever quadrant was separated from the instrument panel.

At the conclusion of the examinations of the airframes and engines of both airplanes, no evidence of any preimpact flight control or mechanical failure or malfunction was found which would have prevented both airplanes from operating normally.

PATHOLOGICAL INFORMATION

Cessna 172R (CFI)

An autopsy was performed on the CFI on December 9, 2008, by the Office of the Medical Examiner District-17, Fort Lauderdale, Florida, as authorized by the coroner of Broward County, The cause of death was reported as "multiple blunt force trauma."

Toxicological screening performed by the FAA Civil Aero medical Institute found 14 (mg/dl, mg/hg) ethanol detected in the muscle, and 17 (mg/dl, mg/hg) of ethanol was detected in the kidney. Putrefaction was noted in the samples.

Cessna 172R (pilot receiving instruction)

An autopsy was performed on the private pilot on December 9, 2008, by the Office of the Medical Examiner District-17, Fort Lauderdale, Florida, as authorized by the coroner of Broward County, The cause of death was reported as "multiple blunt force trauma."

Forensic toxicology was performed on specimens from the pilot by the FAA Civil Aero medical Institute. The toxicology report stated no ethanol was detected in the liver or muscle, and no drugs were detected in the liver.

Piper PA-44-180 (CFI)

An autopsy was performed on the certified flight instructor on December 9, 2008, by the Office of the Medical Examiner District-17, Fort Lauderdale, Florida, as authorized by the coroner of Broward County, The cause of death was reported as "multiple blunt force trauma."

Toxicological screening performed by the FAA Civil Aero medical Institute found 25 (mg/dl, mg/hg) ethanol detected in the muscle, and 21 (mg/dl, mg/hg) of ethanol was detected in the heart. No ethanol was detected in the blood, and 26 (mg/dl, mg/hg) of methanol was detected in the blood. Although no putrefaction was noted in the samples, the victim had not been recovered until approximately 20 hours after the accident.

Piper PA-44-180 (pilot receiving instruction)

An autopsy was performed on the commercial pilot on December 9, 2008, by the Office of the Medical Examiner District-17, Fort Lauderdale, Florida, as authorized by the coroner of Broward County, The cause of death was reported as "multiple blunt force trauma."

Toxicological screening performed by the FAA Civil Aero medical Institute found 37 (mg/dl, mg/hg) ethanol detected in the muscle, and no ethanol was detected in the liver. 69 (mg/dl, mg/hg) of methanol was detected in the muscle. Putrefaction was noted in the samples. 1.466 (ug/mL, ug/g) of norfluoxetine was detected in the liver, and 0.25 (ug/ mL, ug/g) of norfluoxetine was detected in the kidney. Review of the medical records on file with the Aerospace Medical Certification Division disclosed that there was no mention of any medication or medical condition dating back to December 11, 2006.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	21,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	December 6, 2007
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 27, 2007
Flight Time:	(Estimated) 920 hours (Total, all aircraft), 563 hours (Total, this make and model), 870 hours (Pilot In Command, all aircraft), 94 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft)		

Student pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	37,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	December 11, 2006
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	December 6, 2008
Flight Time:	(Estimated) 1156 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N118TP
Model/Series:	PA-44-180	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	44-7995065
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	November 28, 2008 Annual	**Certified Max Gross Wt.:**	3816 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	7719 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	LO-360-F1A6D
Registered Owner:	AIRLINE TRANSPORT PROFESSIONALS CORP OF USA	**Rated Power:**	180 Horsepower
Operator:	AIRLINE TRANSPORT PROFESSIONALS CORP OF USA	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

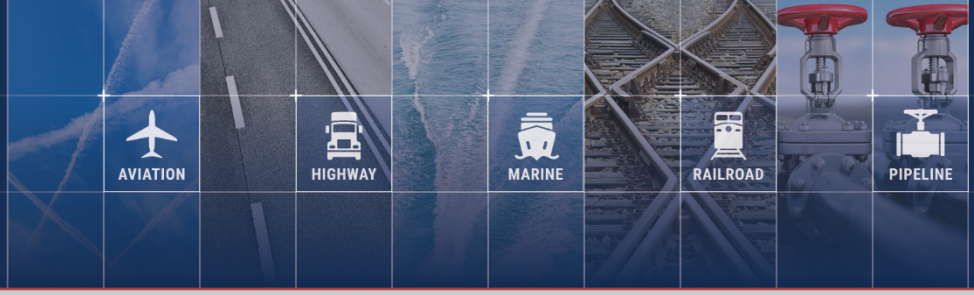
Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HWO,8 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.03 inches Hg	**Temperature/Dew Point:**	26°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Fort Lauderdale, DC (FLL)	**Type of Flight Plan Filed:**	None
Destination:	Fort Lauderdale, DC (FLL)	**Type of Clearance:**	Unknown
Departure Time:	15:20 Local	**Type of Airspace:**	Special

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	26.004444,-80.480003

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric
Additional Participating Persons:	Bud Melvin; FAA/FSDO; Ft. Lauderdale, FL Tom Moody; Cessna; Wichita, KS Ronald Maynard; Piper; Vero Beach, FL
Original Publish Date:	July 14, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=69538



Aviation Investigation Final Report

Location:	Ft. Lauderdale, Florida	**Accident Number:**	ERA09FA080
Date & Time:	December 6, 2008, 16:30 Local	**Registration:**	N369ES
Aircraft:	Cessna 172R	**Aircraft Damage:**	Substantial
Defining Event:	Midair collision	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

A Cessna and Piper were both on instructional flights, operating in a concentrated flight training area that is depicted on a sectional chart. There was no air-to-ground communication in the area, but there was an advisory frequency that was used by the flight schools in the area. The Cessna's pilot reported that he was "...a Cessna 172 holding at FRDDY at 2000 feet." No other radio transmissions were heard from the Cessna. Radar information indicated that the Cessna was on a 210-degree course and was tracking at a speed of 86 knots. The Piper was on a course of 160 degrees and was tracking at a speed of 126 knots. Both airplanes converged on the same position, and the collision occurred at about 2,000 feet above ground level. The reported weather about the time of the accident included clear skies and visibility of 10 miles.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of both pilots to see and avoid the other aircraft.

Findings

Personnel issues	Monitoring other aircraft - Pilot
Personnel issues	Monitoring other aircraft - Pilot of other aircraft

Factual Information

History of Flight

Maneuvering	Midair collision

"THIS CASE WAS MODIFIED MAY 19, 2009."

HISTORY OF FLIGHT

On December 6, 2008, about 1630 eastern standard time, a Piper PA-44-180, N118TP, and a Cessna 172R, N369ES, collided in midair about 18 miles west of the Ft. Lauderdale Hollywood International Airport (FLL), Ft. Lauderdale, Florida. N118TP was owned by Airline Transport Professionals Corp of USA and was being operated under visual flight rules (VFR) as an instructional flight. N369ES was owned by Pelican Flight School and was being operated as a VFR instructional flight. Both airplanes were substantially damaged. The certified flight instructor (CFI) and the certificated commercial pilot aboard N118TP were both killed. The certified flight instructor and the certificated private pilot aboard N369ES were also killed. Both airplanes were operated under Title 14 Code of Federal Regulations (CFR) Part 91. Visual meteorological conditions prevailed at the time of the accident.

Both airplanes were operating in the A-291B concentrated flight training area prior to the time of the accident. This area is depicted on the Miami sectional chart as (A- Alert) special use airspace. A-291B is in operation from 0600 to 2400. The flight altitude for this area is 0 to 3900 feet above ground level (agl), and there is no air to ground communications provided in this area.

According to the owner of Pelican Flight School, the purpose of the Cessna's flight was to practice flight maneuvers prior to the private pilot taking his instrument checkride. Other instructors at the school stated that they heard their flight instructor in the concentrated flight training area A-291B, over frequency 123.45 making position reports. This is a frequency used by the flight schools in the local area when operating in A-291B; flight instructors often use this training area for students. They recalled that the Cessna's pilot reported that he was "North Perry training area, this is a Cessna 172 holding at FRDDY at 2000 feet." No other radio transmissions were heard from the Cessna.

According to the Airline Transport Pilot flight school personnel, the purpose of the Piper's training flight was to train the commercial rated pilot for his multiengine instructor certificate. Based on a report from the Airline Transport Pilot flight school, the airplane departed FLL to conduct a local training flight. There have been no reports of any radio transmissions from the Piper, while in the training area A-291B. According to instructors at the Airline Transport Pilot flight school they were familiar with the 123.45 frequency.

Radar information provided by Federal Aviation Administration (FAA) Air Traffic Control (ATC) personnel indicates that the Cessna was on a 210-degree course magnetic, and was tracking at a speed of 86 knots. The Piper was on a course of 160 degrees magnetic, and was tracking at a speed of 126 knots. Both airplanes converged on the same position, and the collision occurred at about 2,000 feet above ground level (agl), north of the FRDDY intersection.

PERSONNEL INFORMATION

Pilots of N369ES

CFI (right seat)

The instructor in N369ES, age 25, held a certified flight instructor certificate, with ratings for airplane single-engine land, airplane multiengine land, and instrument airplane. His certificate was issued on July 7, 2007. He held a first-class medical certificate issued on March 19, 2008. At the time of the accident, he was employed by Pelican Flight School as a flight instructor. The pilot indicated on his last application for the first-class medical certificate that he had accumulated 816 total flight hours.

Pilot receiving instruction (left seat)

The pilot receiving instruction, age 30, held a private pilot certificate, with a rating for airplane single-engine land. His certificate was issued on January 18, 2002. He held a second-class medical certificate issued on August 22, 2006. A review of the pilot's logbook disclosed that he had logged 179 total flight hours.

Pilots of N118TP

CFI (left seat)

The instructor in N118TP, age 21, held a certified flight instructor certificate, with ratings for airplane single-engine land, airplane multiengine land, and instrument airplane. His certificate was issued on November 10, 2007. He held a first-class medical certificate issued on December 6, 2007. A review of the pilot's logbook disclosed that he had logged 920 total flight hours. At the time of the accident, the certified flight instructor was employed by Airline Transport Pilot flight school as a flight instructor.

Pilot receiving instruction (right seat)

The pilot receiving instruction, age 37, held a certified flight instructor certificate, with ratings for airplane single-engine airplane land and instrument airplane. His certificate was issued on April 28, 2006. He held a second-class medical certificate issued on December 11, 2006. The pilot indicated on his last application for the second-class medical certificate that he had

accumulated 1,156 total flight hours.

AIRCRAFT INFORMATION

Cessna 172R

The airplane was manufactured in 1997 as a four-seat, high-wing airplane with fixed tricycle landing gear and powered by a Lycoming IO-360-L2A, 160-horsepower engine. Review of the aircraft logbook disclosed that an annual inspection was conducted on September 2, 2008, at a tachometer time of 3,182.1 hours. The last 100-hour inspection was conducted on November 6, 2008, at a tachometer time of 3,273.5 hours.

Piper PA-44-180

The airplane was manufactured in 1979 as a four-seat, low-wing airplane with retractable tricycle landing gear and powered by a Lycoming LO-360-F1A6D, 180-horsepower engine on the right side. The left side engine was an O-360-E1A6D, 180-horsepower engine. Review of the aircraft logbook disclosed that an annual inspection was conducted on November 28, 2008, at a tachometer time of 7,719.4 hours.

METEOROLOGICAL INFORMATION

The reported weather at North Perry Airport, located about 5 miles east of the accident site, at 1553, was: wind from 230 degrees at 11 knots; visibility 10 miles; sky clear; temperature 26 degrees Celsius; dew point 16 degrees Celsius; altimeter 30.03 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The Cessna airplane came to rest inverted in approximately 3 feet of water in the Everglades National Park. The right wing had separated and was located approximately 100 feet east of the main wreckage. The Piper also came to rest in approximately 3 feet of water in the park. Both airplanes were located approximately 18 miles west of FLL. The distance between both airplanes was 2,463 feet. The Cessna was on a 229-degree magnetic bearing, and the Piper was on a magnetic bearing of 140 degrees.

Cessna 172R

Examination of the Cessna disclosed that it had numerous paint transfer marks. The left side of the fuselage had several marks just aft of the cabin door. The vertical stabilizer leading edge had blue and red transfer marks approximately 3 feet in length, from the base toward mid-span. The right wing leading edge had red transfer marks near the tip. The Piper was painted a white base, with red and blue stripes and a solid blue tail.

The fuselage was substantially damaged by impact with the terrain. The firewall was pushed

aft into the cockpit. The door frames and cabin skins were buckled. The empennage was bent over to the right, approximately 90 degrees. The instrument panel was fragmented. No instruments or avionics were observed. The circuit breakers centers were missing. The nose gear piston and barrel were straight. The top of the barrel was bent just below the upper attach fitting.

All flight controls were found attached or partially attached to their joining surfaces. The left elevator weight was damaged and separated. Flight control cable continuity was confirmed. Several cables were separated and exhibited a condition consistent with tension overload. The left wing remained partially attached to the fuselage and exhibited leading edge compression damage to its full length. The wing strut was damaged and separated from the fuselage. The main landing gear was still attached to the fuselage and impact damaged. The right wing was mostly intact, with a diagonal crease forward of the aileron. The right wing root also exhibited damage. The wing strut separated inboard of mid-span, with both ends connected to their respective attachment points. The vertical stabilizer leading edge was crushed approximately 8 inches aft, approximately mid-span.

Examination of the engine disclosed it was impact damaged. The engine was partially disassembled for examination. The top forward section of the engine case halves were impact damaged. The top spark plugs were removed, and the cylinders contained water and dirt from the marsh. The valve covers were removed, and water and dirt from the marsh were observed in the cylinder heads. The oil sump was impact damaged and was separated from the engine. Both magnetos were impact damaged and partially separated from the accessory housing. The vacuum pump was still connected to the accessory housing, and was removed for examination. The vacuum pump coupling was still intact, but the pump was impact damaged. The propeller and spacer separated from the crankshaft propeller attach flange. The propeller attaching bolts were bent over nearly 90 degrees. Blade A was bent aft approximately 160 degrees. The leading edge tip had gouge marks. Blade B was twisted in the direction of rotation and bent aft approximately 45 degrees. The outboard 5 inches of the tip was not recovered.

Piper PA-44-180

Examination of the Piper disclosed that the fuselage was fragmented throughout the sidewalls, cabin roof, and floor. The instrument panel area was crushed and did not contain any flight instruments. The cockpit section contained the rudder pedals, the copilot control wheel, and the pilot's control wheel. All instruments and avionics equipment were impact damaged. The forward nose section contained the nose gear assembly, which was in the up and locked position. There were two transponders recovered from the airplane. One was set to code 1200 and was in the altitude mode. The other transponder was set to 2000, and in the off position.

Examination of the right wing disclosed that the nacelle was separated from the wing main spar. Leading edge skins were separated from the main spar from root to tip. The main spar was bent and twisted from the root stub spar to the wing tip. Control cable continuity was

observed to the aileron bell-crank. The bell-crank was bent, twisted and damaged. The aileron cables at the wing root exhibited a condition consistent with tension overload. The nacelle fuel tank bladder was breached and separated from the nacelle. The nacelle forward skins were breached. The main landing gear assembly was down but not locked, and its hydraulic actuator cylinder was impact damaged. The engine with mount was detached from the nacelle.
Examination of the left wing disclosed that it was separated from the fuselage structure and consisted of approximately 7 feet of the inboard section, with approximately 7 feet of flap attached by its inboard wing spar attach hinge. The main spar and adjoining leading edge skins were missing from the outboard flap hinge to the wing tip. The nacelle and the fuel cell were breached. The main landing gear was detached from the wing spar mounts and exhibited impact damage. The engine with mount was detached from the nacelle.

Examination of the left stabilizer exhibited leading edge compression and was bent upward approximately 60 degrees. The right stabilizer leading edge exhibited downward bending with the skin seams split.

The vertical stabilizer exhibited leading edge impact damage and accordion crushing 4 feet from its fuselage attachment point. The rudder was partially attached to the vertical stabilizer by the hinges. Control cable continuity was established for stabilator and rudder and trim tabs at the separated tail cone to the controls. All flight control surfaces were located at the wreckage site and impact damaged, and all flight control cable separation points were consistent with overload.

The left and right engines were separated from their respective nacelles and exhibited impact damage with a case breach condition and damage to various accessories. Both propellers exhibited blade bending and other damage. Engine power control continuity was partially traced due to separation of wings and engines from nacelles. Damage was noted on all viewed engine controls. The power lever quadrant was separated from the instrument panel.

At the conclusion of the examinations of the airframes and engines of both airplanes, no evidence of any preimpact flight control or mechanical failure or malfunction was found which would have prevented both airplanes from operating normally.

PATHOLOGICAL INFORMATION

Cessna 172R (CFI)

An autopsy was performed on the CFI on December 9, 2008, by the Office of the Medical Examiner District-17, Fort Lauderdale, Florida, as authorized by the coroner of Broward County, The cause of death was reported as "multiple blunt force trauma."

Toxicological screening performed by the FAA Civil Aero medical Institute found 14 (mg/dl,

mg/hg) ethanol detected in the muscle, and 17 (mg/dl, mg/hg) of ethanol was detected in the kidney. Putrefaction was noted in the samples.

Cessna 172R (pilot receiving instruction)

An autopsy was performed on the private pilot on December 9, 2008, by the Office of the Medical Examiner District-17, Fort Lauderdale, Florida, as authorized by the coroner of Broward County, The cause of death was reported as "multiple blunt force trauma."

Forensic toxicology was performed on specimens from the pilot by the FAA Civil Aero medical Institute. The toxicology report stated no ethanol was detected in the liver or muscle, and no drugs were detected in the liver.

Piper PA-44-180 (CFI)

An autopsy was performed on the certified flight instructor on December 9, 2008, by the Office of the Medical Examiner District-17, Fort Lauderdale, Florida, as authorized by the coroner of Broward County, The cause of death was reported as "multiple blunt force trauma."

Toxicological screening performed by the FAA Civil Aero medical Institute found 25 (mg/dl, mg/hg) ethanol detected in the muscle, and 21 (mg/dl, mg/hg) of ethanol was detected in the heart. No ethanol was detected in the blood, and 26 (mg/dl, mg/hg) of methanol was detected in the blood. Although no putrefaction was noted in the samples, the victim had not been recovered until approximately 20 hours after the accident.

Piper PA-44-180 (pilot receiving instruction)

An autopsy was performed on the commercial pilot on December 9, 2008, by the Office of the Medical Examiner District-17, Fort Lauderdale, Florida, as authorized by the coroner of Broward County, The cause of death was reported as "multiple blunt force trauma."

Toxicological screening performed by the FAA Civil Aero medical Institute found 37 (mg/dl, mg/hg) ethanol detected in the muscle, and no ethanol was detected in the liver. 69 (mg/dl, mg/hg) of methanol was detected in the muscle. Putrefaction was noted in the samples. 1.466 (ug/mL, ug/g) of norfluoxetine was detected in the liver, and 0.25 (ug/ mL, ug/g) of norfluoxetine was detected in the kidney. Review of the medical records on file with the Aerospace Medical Certification Division disclosed that there was no mention of any medication or medical condition dating back to December 11, 2006.

Flight instructor Information

Certificate:	Flight instructor	**Age:**	25,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	Yes
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	March 19, 2008
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 3, 2008
Flight Time:	(Estimated) 816 hours (Total, all aircraft)		

Student pilot Information

Certificate:	Private	**Age:**	30,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	August 22, 2006
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	May 31, 2008
Flight Time:	(Estimated) 179 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N369ES
Model/Series:	172R	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	17280024
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	September 2, 2008 Annual	**Certified Max Gross Wt.:**	2400 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	3274 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	IO-360
Registered Owner:	On file	**Rated Power:**	180 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:	HWO,8 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	270°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.03 inches Hg	**Temperature/Dew Point:**	26°C / 16°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hollywood, FL (HWO)	**Type of Flight Plan Filed:**	None
Destination:	Hollywood, FL (HWO)	**Type of Clearance:**	None
Departure Time:	15:00 Local	**Type of Airspace:**	Special

Wreckage and Impact Information

Crew Injuries:	2 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	26.004444,-80.480003

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric
Additional Participating Persons:	Bud Melvin; FAA/FSDO; Ft. Lauderdale, FL Tom Moody; Cessna; Wichita, KS Ronald Maynard; Piper; Vero Beach, FL
Original Publish Date:	July 14, 2009
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=69538