



TO: Chihoon Shin, National Transportation Safety Board, Washington, DC 20560

FROM: Carla J. Dove, Ph.D., Smithsonian Institution, Division of Birds, National Museum of Natural History, Washington, DC 20560

DATE: 11 December 2025

RE: **Results of bird identifications in samples from NTSB ERA25MA171
Jersey City, NJ. Bell 206L-4 Helicopter Crash, 10 April 2025**

Reference numbers: FAA 2025-04-22-093241; Smithsonian Feather Lab 250422.1

The Smithsonian Institution's Feather Identification Lab, National Museum of Natural History (NMNH) has examined 126 samples from three separate collecting efforts for investigation ERA25MA171. The initial 9 samples were hand-carried to the Smithsonian by Leani Benitez-Cardona, National Transportation Safety Board (NTSB) in mid-April 2025. Samples 10-82 were collected by Carla Dove (Smithsonian Institution) on 16 June 2025 at AMF Aviation storage facility in MA. Additional samples 83-118 of rotor blades (#303, #304) were collected by Carla Dove on 9 September 2025 at NTSB Headquarters, Washington, DC with assistance from Donald Kramer (NTSB). Of the 126 samples, 53 were collected from the rotor blades.

Bird remains were identified using whole/fragmentary feather comparisons with preserved bird specimens, microscopic examinations of diagnostic characters, and DNA analyses. Bird/feather identifications were conducted at NMNH; DNA analyses were conducted in the Laboratory of Analytical Biology (LAB) at NMNH. If unknown samples did not yield DNA results on the first attempt, up to three separate extractions using multiple protocols were conducted at our discretion. Similarly, multiple microscopic slides were made from samples that did not yield results. Genetic sexing was conducted to determine the minimum number of individuals on samples with adequate sample quality. Because species of 'white-headed' gulls (*Larus sp.*) cannot be reliably determined using DNA analysis alone, molecular sequences of all 'white-headed' gulls were compared with the possible gull species in the area and those samples with highest similarity to the on-line sequence library were recorded as probable, especially if physical evidence was available (i.e. feathers) to support the molecular identification. Samples identified to 'goose' and 'gull' include samples that were too minute or degraded to obtain quality DNA sequences and were identified to the avian Family level using microscopy. These microscopic identifications are supportive of other samples found on the aircraft that produced species level identifications. Probable goose species in the geographic area at the time of this event include Canada Goose and Brant Goose. Probable gulls in the area include Great Black-backed Gull, Herring Gull and Ring-billed Gull.

A list of samples and identification results is attached to this report (Attachment 1, multiple tab headings). At least 9 different species of birds were identified from samples in this case. Photographs obtained from the wreckage site in the Hudson River show massive amounts of debris, trash, and plants floating amongst the helicopter parts making contamination from loose feather debris unrelated to the accident highly possible. Thus, some initial species dismissals were conducted and validated by expert ornithological assessment (Dr. Carla Dove) to refine the species list to those most likely to cause a catastrophic event. For example, American Woodcock, songbird, and doves were identified from samples but are unlikely to comingle (flock) with larger birds in this situation. Additionally, these species have small body masses (<1/2 lb.), making it unlikely that they had a significant effect on the helicopter. Some species of duck (Gadwall, Mallard) were identified from samples but were dismissed because of sample context (mixed with plant/mud) and these birds do not typically flock with geese. Cockpit contamination from jacket filling was eliminated by examination of photographs of jacket materials provided by NTSB (jacket linings did not contain down filling). Bird identifications from the front of the helicopter and cockpit seats were determined to be contaminations from debris from the river based on the species identified and the lack of impact evidence on this portion of the helicopter. Validated bird species were mapped to the area of the helicopter from where the sample was taken (Attachments 2).

In addition to contamination of evidence from the water, birds flying in the area could have been pummeled by flying debris as the helicopter broke apart in mid-air. Various parts of the helicopter were impacted by different species of birds that normally do not comingle indicating that birds were impacted at different times. One intact bird wing from Great Black-backed Gull, together with a few pieces from the rotor (foam) and tail section fragment, was recovered from the rooftop of a building near where the accident occurred.

If this accident resulted from impacts with birds (bird strike), the species initiating the chain of events depends on which section of the helicopter failed first.

Species identified in the examination of samples in this investigation likely to cause catastrophic damage include:

Mixed-species flock of Geese – Geese (Brant and Canada) impacted the horizontal stabilizer and rotor blades.

Brant (*Branta bernicla*) – identified only from samples collected from the left side of the helicopter and from the rotor blade 304: upper vertical fin; left finlet; left horizontal stabilizer (goose). Both male and female individuals were identified, indicating at least two separate birds impacted the aircraft/rotor blades. The mean/ maximum weight of Brant is 3.1/3.9 lbs. (male) and 2.7/3.5 lbs. (female). This species is common in the NYC area from October-May; sightings of Brant were reported to the on-line public birding website (e-bird) all along the Hudson River in April 2025. An eyewitness account of about 20 ‘geese’ taking flight and heading toward the river just minutes before a loud bang was heard corroborates geese in the area shortly before the crash (NTSB Witness

Report 31 July 2025). Another witness from about 0.3 miles from the crash site observed the helicopter falling from the sky with the rotor detached and then “saw gray or black colored ‘bits’ of organic debris floating down from the sky which she identified as birds and/or feathers. The debris was not metallic in appearance and did not seem to be part of the helicopter” (NTSB Witness Report, September 8, 2025). Review of video footage from multiple locations confirm ‘geese’ in area at the time of the accident. The FAA Wildlife Strike Database has records of 17 Brant strikes at NYC airports (LGA, JFK, EWR) from 2020 to 2025 with 3 occurring so far in 2025. April and October are the months with the most strikes at these 3 airports. Brant Geese may come in flocks with Canada Geese but are typically not the dominant species in a mixed flock. Brant are migratory in the New York City area and typically gather and prepare to migrate north to breed in March/April.

Canada Goose (*Branta canadensis*) – identified from samples collected only on the right side of the helicopter: horizontal stabilizer installation; right finlet. Only female sex was identified from the samples in this case. The mean/maximum weight of Canada Geese is 9.6/10.4 lbs. (male) and 7.7/8.6 lbs. (female). This species is common in the NYC area and sightings were reported all along the Hudson River in April 2025. The FAA Wildlife Strike Database has records of 36 Canada Goose strikes at NYC airports (LGA, JFK, EWR) from 2020 to 2025 with 5 occurring so far in 2025.

Great Black-backed Gull (*Larus marinus*) – identified from samples collected only from the left side of the helicopter: left horizontal stabilizer; left finlet, and building rooftop. One complete bird wing was found on the rooftop of a building near the accident. The wing sample was examined and determined not to have been deposited on the roof by a predator (as prey remains) because of the condition and appearance of the wing. The wing had fresh flesh with bones clearly severed from the body. The feathers of the wing were noted to be damaged by many small holes that were made by penetration (not feather mites or insect damage) from some type of debris entering through the ventral (underside) wing and exiting through the dorsal (upper) surface of the feathers. This indicates that this individual bird may have been pummeled by high-speed, flying debris from the helicopter break up in mid-air. The mean/maximum weight of Great Black-backed Gull is 4.0/5.0 lbs. (male) and 3.3/4.6 lbs. (female). All samples identified as Great Black-backed Gull were DNA sexed as female. This species is common in the NYC area and sightings were reported all along the Hudson River in April 2025. Review of video footage from various sources shows large, single birds with the silhouette of ‘gull’ flying along the river. The FAA Wildlife Strike Database has records of 14 Great Black-backed Gull strikes at NYC airports (LGA, JFK, EWR) from 2020 to 2025 with 1 occurring so far in 2025. April is the month with the highest number Great Black-backed Gull strikes at these 3 airports.

Rotor Blades (#303, #304) were sampled in detail on two occasions. Of the 53 total samples collected, 5 had validated bird remains. The only species-level identification



produced from rotor samples was Brant (female), but generic 'goose' (which could include Brant or Canada) was found in 5 samples and on both rotor blades, including a single finding of 'goose' found embedded in a crack at the distal end of blade #303. Duck and dove (unidentified species) were identified from rotor blade samples but were dismissed as likely contaminants because of mud/plant substrate in the sample. The tip of rotor blade #304 was not recovered but Brant was identified from the impact on the upper trailing edge of this blade.

Based on the adequate samples obtained in the examination of this event, the conclusions of the Smithsonian analyses are that 1) A mixed-species flock of Brant and Canada Geese impacted the rotor blades and the horizontal stabilizer. 2) Great Black-backed Gull was hit by flying debris from the tail section at force enough to mangle the bird and cause the bird wing to separate and come to rest on the rooftop with other helicopter debris. Only female specimens of Great Black-backed Gull were identified from samples in this case. It is unlikely that Great Black-backed Gull would come along with a flock of geese.

Thanks to the NTSB for travel assistance to the storage facility and to Dr. Richard Dolbeer (USDA Science Advisor, Airport Wildlife Hazards Program) for discussion on this report and FAA Wildlife Database queries. Airport biologists Jeffrey Kolodzinski and Laura Francoeur (Port Authority of New York and New Jersey) were consulted regarding ground-truthing of bird behavior and status in the airport area. If you have any questions, please let us know. Good luck with this investigation.

Sincerely,

A handwritten signature in dark ink, appearing to read "Carla Dove", is written over a black rectangular redaction box.

Carla Dove, Ph.D.
Feather Identification Lab
Washington, DC 20560

A black rectangular redaction box covering contact information.

Ref: FAA Wildlife Strike Database queried 7 Nov 2025 <https://wildlife.faa.gov/edit>

Attachment 1 – Excel Spreadsheet of sample identification results (multiple tabs)
Attachment 2 – Illustration with validated bird identifications mapped on helicopter