

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594



November 16, 2020

MATERIALS LABORATORY FACTUAL REPORT

Report No. 20-059

1. ACCIDENT INFORMATION

Place : San Jose, California
Date : August 2, 2020
Vehicle : Cessna 172S, N55231
NTSB No. : WPR20LA256
Investigator : James Bledsoe, AS-WPR

2. COMPONENTS EXAMINED

Pieces of wing skin sections

3. DETAILS OF THE EXAMINATION

On August 2, 2020, about 1017 Pacific daylight time, a Cessna 172S sustained substantial damage when it was involved in an accident near San Jose, CA. The pilot and the passenger were not injured. The pilot was returning to the airport when the airplane collided with an object, causing the airplane to yaw to the right losing altitude. The pilot notified the tower and executed a precautionary landing, touching down safely without further incident.

The Materials Laboratory received pieces of the wing skin as shown in Figure 1 and Figure 2 from the external and internal sides, respectively. The larger piece had buckled and crumpled in multiple locations, exhibiting spalling and loss of the external white paint layer. This paint loss was located parallel to the most deformed locations of the section. The periphery of the larger piece showed a jagged appearance, consistent with having been cut from the surrounding structure.

The smaller piece was in a rounded U-shape, shown in the lower right in the first two figures. This piece was also dented, and still contained the external heads of several rivets. Most of the paint on this piece was still adherent.

The surfaces of the skin fragments were inspected using an ultraviolet (UV) light. Figure 3 shows the external surface of the larger fragment exposed to UV light. A rounded splat-shape, approximately 0.75 inches in diameter was found to fluoresce under UV light exposure. This fluorescing substance was a candidate for biological fluids.

The pieces were sent to the Feather Identification Lab at the Smithsonian Institute National Museum of Natural History for inspection designed to find avian contamination. The details of their examination are in Appendix A. The results were consistent with that of a golden eagle or *Aquila chrysaetos*, which were consistent with biological material recovered near the accident location. These results were consistent with those of other specimens sent directly to the Feather Identification Lab from the accident airplane, which were also consistent with an in-flight collision with the recovered golden eagle.

Erik M Mueller
Materials Research Engineer



Figure 1 – Sections of the dented wing skin assembly, viewed from the exterior side, as received.



Figure 2 – Sections of the dented wing skin assembly, viewed from the interior side, as received.

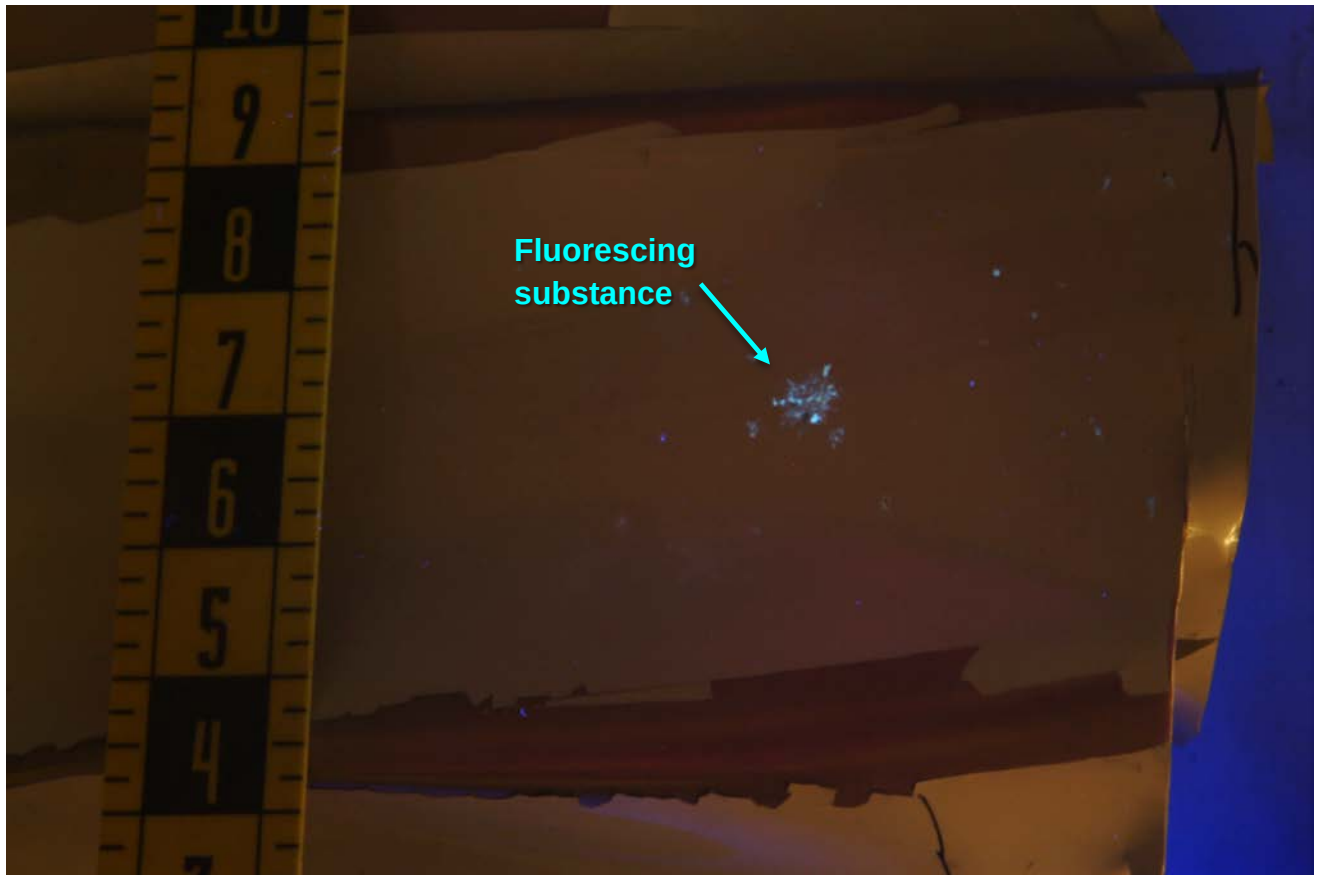


Figure 3 – View of the exterior surface of the skin fragment, viewed using ultraviolet lighting, showing an area of a fluorescing substance on the surface.

APPENDIX A

Feather Identification Lab Report on Specimens 200925.14.1 through 200925.14.6



Smithsonian Institution

**NATIONAL
MUSEUM of
NATURAL
HISTORY**

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2 November 2020

Mr. Mueller and Mr. Bledsoe,

Two portions of the leading-edge of the right wing from a Cessna 172 (N55231) aircraft (Accident No. WPR20LA256, San Jose, CA: date 2 August 2020) were received by the Smithsonian Institution on 5 October 2020 for examination for bird remains. The samples for these two aircraft parts were received from Mr. Mueller (Washington, DC) and labeled by the Feather Identification Lab as 200925.14.1 and 200925.14.2.

In addition to the leading-edge parts described above, 4 additional bags of feather samples (same event) were received from Mr. James Bledsoe (25 September 2020). One of the bags (2000925.14.3) was labeled "Removed from the right wing of N55231" and consisted of very little visible feather material. The three other bags (200925.14.4, 200925.14.5 and 200925.14.6) contained whole feather samples collected on 9 August 2020 by the Santa Clara County Sheriff Search and Rescue Team. Some of these feather samples were pulled from a large brown bird carcass found in the flight path of the aircraft, but one bag (#4) contained a small group of brown feathers that was reportedly found in the grass on the flight path and were collected from a different location than the whole bird.

The identifications of the samples are listed below:

Aircraft samples received from Mr. Mueller:

1. Golden Eagle (*Aquila chrysaetos*), microscopic feather sample removed from small piece of leading-edge (200925.14.1) of aircraft. Microstructure consistent with Golden Eagle (Photo 1).
2. Golden Eagle, microscopic sample removed from large piece of leading-edge (200925.14.2). Microstructure consistent with Golden Eagle.

Feather samples received from Mr. Bledsoe:

3. Golden Eagle, microscopic sample in bag received from Bledsoe (200925.14.3). Microstructure consistent with Golden Eagle (Photo 3).

4. Turkey Vulture (*Cathartes aura*), whole feather comparisons to museum study skins and DNA analysis. Feathers recovered from a different location on the flight path than those identified as Golden Eagle. (200925.14.4).
5. Golden Eagle, whole feather comparisons to museum study skins (200925.14.5).
6. Golden Eagle, whole feather comparisons to museum study skins (200925.14.6).

This report is consistent with the photographs (not included here) of the large bird carcass recovered at the scene and reported by the Santa Clara County Sheriff Search and Rescue Team. If you have further questions, please let me know.

Sincerely,



[Redacted]

Feather Identification Lab
Smithsonian Institution

Attached: Photomicrographs of feather samples.



Photo 1. Photomicrograph of partial feather barbule removed from a small piece of leading edge (200925.14.1). Microstructure is consistent with Golden Eagle.

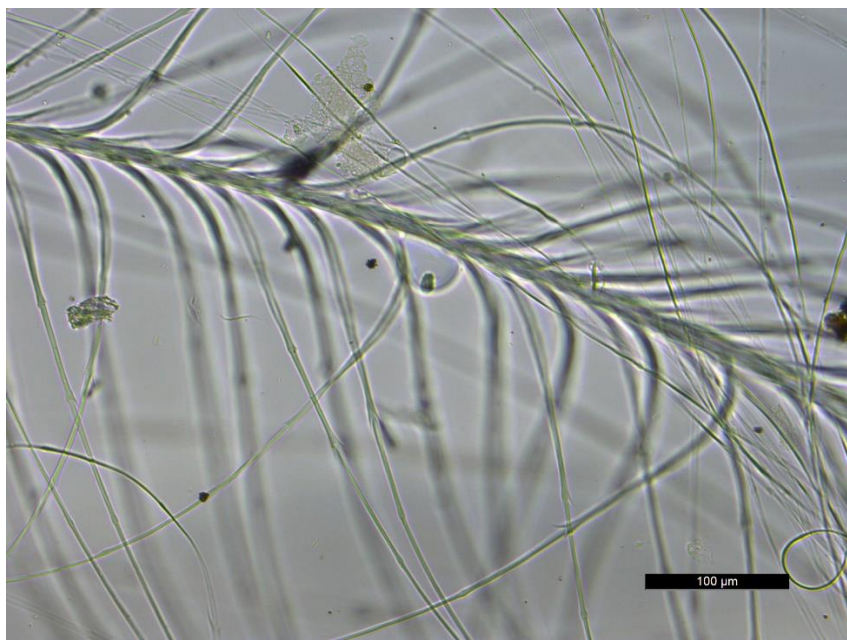


Photo 2. Photomicrograph of feather barb removed from a large piece of leading edge (200925.14.2). Microstructure is consistent with Golden Eagle.

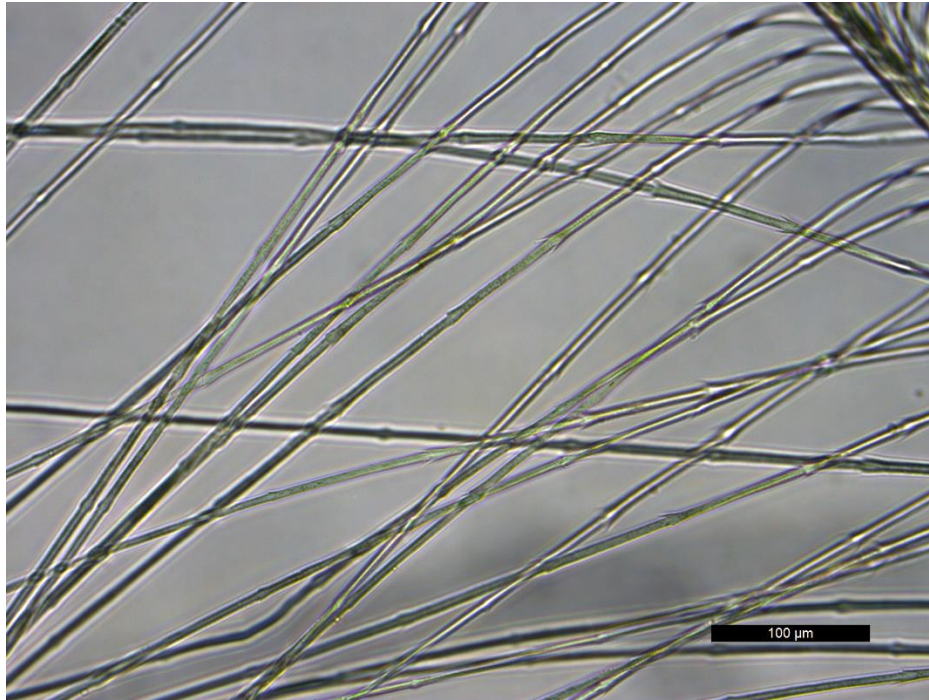


Photo 3. Photomicrograph of feather barb found in sample bag (200925.14.3). Microstructure consistent with Golden Eagle.