# Developing a Novel 3D-Printed Solution to Aid Healing Fractured Wing Bones of Wild Birds

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Many birds die each year due to broken wings. The current method of repairing broken wing bones is called “pinning”. It involves inserting a pin through the hollow center of the bird bone and is held in place with external pins along the side. However, pinning poses a problem because it pierces the bird’s skin, which can result in permanent damage. According to Dr. Robert G. Volz, bone strength decreases by approximately 25% per hole. Furthermore, it is an expensive process because an accredited veterinarian is required to perform the surgery and it also opens up channels for bacterial infections. These costs place a heavy burden on the wildlife centers. For these reasons, we wanted to find an affordable, non-invasive, and easily adaptable solution to fixing broken Radius and Ulna bones in a bird wing. We designed and produced three prototype 3D printed splints to repair the Radius and Ulna bones of a broken bird wing The first type of splint we printed would hold the Radius and Ulna in place with screws going through the wing. We printed two more splints that are only placed on the exterior of the skin and were held in place either with a C-clamp or magnets. Because the magnets were not bulky, they were expected to reduce the weight of the splint and minimize problems posed to the bird. We hypothesized that the splint with magnets would function the best because they were noninvasive, lightweight, and can be placed quickly on the bird even by a non-accredited veterinarian. We tested each of these splints on four dead Great Horned Owls for ease of fitting, comfortability, weight, tension, and displacement of the splint after rapid wing movement. We found that the splint with magnets worked the best out of the three splints, and so our hypothesis was accepted.

**Awards Won:**
National Anti-Vivisection Society: Third Award of $1,000