

Disease Strikes Again at Salton Sea

by Steve Johnson



This juvenile brown pelican died before it could be rescued.

Photos by Steve Johnson

Once again, an avian botulism outbreak struck the Sonny Bono Salton Sea National Wildlife Refuge, an important Pacific flyway stopover for migratory birds in southern California, last summer. Since 1996, pelicans and other piscivorous (fish-eating) birds at the Salton Sea have been struck with “type C” botulism. Because of their feeding habitats, pelicans and other piscivorous birds usually don’t contract avian botulism. However, this type doesn’t follow the typical avian botulism cycle.

The U.S. Geological Survey’s National Wildlife Health Center in Madison, Wisconsin, is working to determine exactly how the birds contracted the botulism. Since June 26, 2000, the toxin has killed 717 endangered brown pelicans (*Pelecanus occidentalis*). Of the 1,300 brown pelicans sickened by botulism this year, almost 600 have been successfully rehabilitated and released. The total number of brown pelicans affected this year was close to the total from the worst year, 1996, when 1,429 sickened or dead brown pelicans were retrieved. The last rehabilitated brown pelicans, 15 in all, were released on December 11, 2000.

The outbreak also sickened and killed birds from another 35 species, including American white pelicans (*Pelecanus erythrorhynchos*). Only birds that consume tilapia (*Oreochromis mossambicus*), a saltwater sport fish introduced from Africa, were directly affected by the disease. Scientists from the National Wildlife Health Center traveled to the refuge to take samples of the tilapia for analysis.

Botulism outbreaks have involved pelicans every year at the Salton Sea since 1996, but last summer’s outbreak

started earlier than usual because of warmer June temperatures. While past outbreaks generally have killed more white pelicans, last year’s epidemic killed mostly brown pelicans that are less than one year old. The outbreak officially began June 26, and ended November 22, 2000.

Fifteen Service employees at the refuge worked in shifts 18 hours a day to care for the sick birds. Two Service airboats patrolled the sea all day, every day, to round up sick birds and ferry them back to the on-site pelican rehabilitation hospital. The California Department of Fish and Game (CDFG) provided the refuge with an airboat and crew to assist with disease response efforts. Workers from the CDFG, Salton Sea Authority, and Bureau of Reclamation aided refuge staff during this crisis.

The open-air bird hospital, built in 1997 with money raised by volunteers, can accommodate up to 100 sick birds at a time. Pelicans spend up to 24 hours at the hospital before being sent to one of four off-site, licensed rehabilitation centers, most of which are run by volunteers. Release sites for fully recovered pelicans are located on the coast near the Tijuana Slough and Seal Beach national wildlife refuges in southern California.

Birds that contract avian botulism lose involuntary muscle control, including eyelid function, have clenched feet, and can’t hold up their heads. The disease is not fatal if treated in its early stages. The pelicans, however, are not easily captured until they start showing these symptoms and are seriously ill. Once captured, the pelicans are taken immediately to the refuge’s avian hospital for emergency treatment. This

includes flushing their systems with fresh water and administering antibiotics to their eyes, which become dry and infected when the eyelid muscles are paralyzed. Dead and dying birds must be retrieved quickly from the sea before gulls and shorebirds begin feeding on the fly larvae hatching in the bodies, which can spread the disease. Dead birds are incinerated at the refuge to avoid further spread of botulism. Humans are not generally at risk of contracting avian botulism, but staffers working with sick birds take precautions against botulism and other diseases by wearing rubber boots and gloves, and by cleaning all surfaces and equipment with a bleach solution.

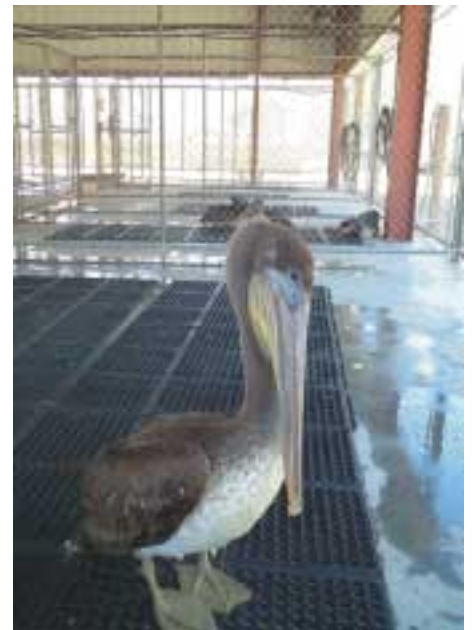
Avian botulism breaks out at the Salton Sea when bacteria and a variety of environmental conditions, including heat, come together to cause a massive growth of algae—an algal “bloom”—which robs fish of oxygen. Researchers at the National Wildlife Health Center believe tilapia concentrate toxins from the Salton Sea in their stomachs. When pelicans ingest tilapia that have been oxygen-deprived, the birds are poisoned. Scientists believe tilapia are easy targets for juvenile pelicans because the fish become sluggish when they are deprived of oxygen.

Disease outbreaks are a chronic problem for the Salton Sea. As a closed body of water fed by the Colorado River and surrounding agricultural lands of Imperial County, it has no way to rid itself of excess salt and nutrient build-up. It is 25 percent saltier than the Pacific Ocean due to the tremendous evaporation that takes place during the hot summer months. As the weather heats up, water evaporates, increasing salinity and creating ideal conditions for botulism. Salinity levels at the sea have been increasing yearly.

At 227 feet (70 meters) below sea level, the Salton Sea is one of the lowest spots in the United States. It also is one of the hottest—summer temperatures top 115 degrees F (47 degrees C) and the daily highs stay above 100 degrees

F (38 degrees C) for 4 months running—and driest, with fewer than 3 inches (7.5 centimeters) of rainfall each year. The Salton Sea is the largest inland body of water west of the Rockies, 35 miles (56 kilometers) long and 9 to 15 miles (14 to 24 km) wide, with an average depth of about 40 feet (12 m). It was created in 1904, when a dike broke and allowed Colorado River water to flow into a natural basin. Since that time, 95 percent of other wetlands in California have been lost to development, making the Salton Sea a critical stopover for migratory birds and habitat for nearly 400 species.

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A juvenile brown pelican at the field hospital. This bird is in relatively good condition and has a good chance for survival. Note the sicker birds lying down in the background.



A Temporary Biological Technician places a sick brown pelican in a pillowcase (or “pellycase”) to prevent the bird’s injury or escape while en route to the field hospital.