W1338

Species Highlight: New World Screwworm

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The New World screwworm (NWS) is a species of blow fly in the family Calliphoridae (Figure 1). Also known as the primary screwworm (*Cochliomyia hominivorax*), this fly received its common name because of its larval (maggot) stage's feeding behavior in which they cause extensive damage to the living tissue of warm-blooded animals using their sharp mouth hooks to burrow into their host, similar to a screw being driven into wood. This pest is endemic in many Caribbean islands and South America. Historically, its range extended into the southern U.S., through Mexico and the Caribbean, and into South America. Control and eradication efforts removed screwworm from North and Central America, and several Caribbean islands.

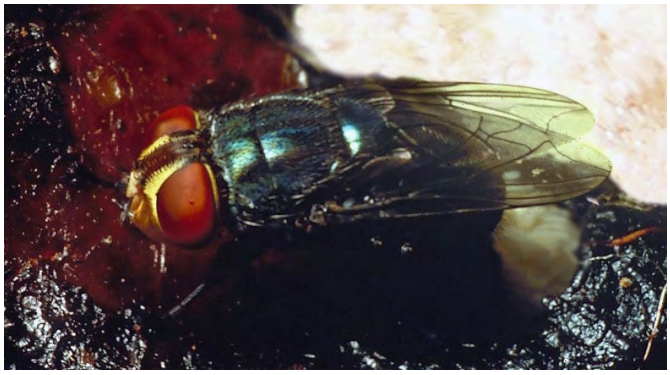

Figure 1: *Close-up of a New World screwworm fly and egg mass on a wound (Credit: USDA)*

History

The first documentation of NWS infestations in the U.S. territory was reported in the early 1830s in Texas. It wasn't until 1933 that NWS was considered to be a major problem in the southeastern U.S. when it caused substantial animal suffering and economic losses. In the 1930s and 1940s, livestock producers faced annual losses of an estimated $10-$20 million (≈250-500 million in 2025 dollars) due to screwworm infestations in their cattle. These losses stemmed from animal deaths, decreased production, increased veterinary costs and additional labor for inspection and treatment.

In the 1950s, USDA researchers Raymond C. Bushland, Edward F. Knipling and Cooper Curtis, conceived the Sterile Insect Technique (SIT), a groundbreaking approach for controlling screwworm populations. Historically, this method involves mass-rearing screwworm flies, sterilizing them using radiation and releasing sterilized pupae into the wild. Currently, the program is releasing chilled adult NWS flies, not pupae. Since female screwworm flies mate only once, the idea was to use this biology to release sterile lab-raised males to mate with fertile wild populations of females. Those females would then lay eggs that were not fertilized, leading to a gradual decline in the population. That is, if the number of sterile flies exceeds the number of native flies the majority of matings will be sterile, thus reducing the native fly population. With a constant rate of release for sterile flies and decreasing native fly population, the ratio of sterile to native flies increases until all matings are sterile and the population is eradicated. The first successful application of SIT occurred in 1954 on the island of Curaçao in the Caribbean Sea, where the screwworm was eradicated within six months. Following this success, SIT programs were launched in Florida in 1957 and expanded throughout the southeastern and southern U.S. By 1966, the screwworm was declared eradicated from the U.S. With the establishment of the Panama-United States Commission for the Eradication and Prevention of Screwworm (also known as COPEG), a biological barrier zone in eastern Panama has been maintained since 2006, preventing NWS from moving north from South America to screwworm-free areas in Central and North America. Cooperation between countries was key to this success.

Despite these successes, the screwworm has re-emerged in certain areas. In 1995, the pest was found in Curaçao, necessitating another eradication campaign. More recently, in 2016, an outbreak occurred in the Florida Keys, marking the first local infestation in the U.S. in more than 30 years. This outbreak resulted in 136 confirmed cases in wildlife, including a 15 percent mortality rate among the endangered Key deer population, and nine cases in domestic animals. The response involved releasing more than 188 million sterile flies across 35 sites over six months, costing approximately $3.2 million.

In 2023, the biological barrier zone in Panama was breached by the fly, leading to an unprecedented number of NWS cases in Panama. Subsequently, cases have been detected in every Central American country and Mexico. On November 22, 2024, the Chief Veterinary Officer of Mexico notified USDA's Animal and Plant Health Inspection Service (APHIS) of a positive detection of NWS in a cow in Chiapas, near the Guatemala border. This detection prompted increased surveillance and preventive measures to reduce the risk of northward spread of this pest. As of July 2025, dozens of cases have been reported in Chiapas, and the most northernly case reported was in the Mexican state of Veracruz, 370 miles from the U.S. border.

Impact

As of July 2025, the NWS has not been found in the U.S.; however, there is concern that the outbreak could further expand into the U.S., primarily due to the movement of animals including cattle in Mexico and across the border into the U.S. This parasitic fly is particularly devastating because the larvae (maggots) feed on the living tissue of their host. Females are attracted to open wounds where they lay their eggs (e.g., cuts, scrapes, tick bites, castration, dehorning, branding, ear tagging, or healing umbilical cords of newborn animals) (Figures 2 & 3). The eggs hatch and the larvae bore into animal tissue and feed on living flesh, expanding the wound. Infested wounds are very attractive to ovipositing (egg-laying) females, resulting in the deposition of additional eggs, enlargement of the wound and eventually, death of the host. All warm-blooded animals are at risk, including livestock, pets, wildlife, and humans.

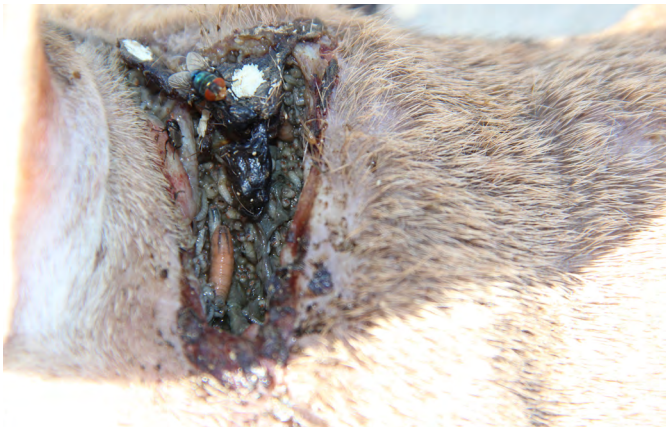

Figure 2: *Close-up of a New World screwworm female fly, eggs, and larvae on an animal's wound (Credit: Samantha Gibbs, U.S. Fish and Wildlife Service)*

Figure 3: *New World screwworm infestation lesions on a Key deer (Credit: Samantha Gibbs, US Fish and Wildlife Service)*

Geographic Distribution

NWS is a tropical species unable to overwinter in temperate regions, which includes Tennessee. NWS is endemic in many Caribbean islands and South America. While the barrier zone in the Darien Province of eastern Panama had been maintained since 2006, this zone was breached in 2023. Since then, NWS has been detected in Costa Rica, Nicaragua, Honduras, Guatemala, Belize, El Salvador and Mexico. Refer to the Online Resources below for a link to view the current outbreak range.

Identification and Life Cycle

Adult screwworm flies have orange eyes, metallic blue/green bodies and three dark stripes on their backs. They are slightly larger than a house fly. Infestation of NWS starts with a female fly laying eggs on a wound or bodily opening (nose, ears, eyes, umbilicus, or genitalia) of a living, warm-blooded animal. Livestock, wildlife, pets and sometimes humans are suitable hosts. A wound as small as a tick bite can give off an odor that attracts the female NWS flies. In her lifetime, a female NWS fly can lay up to 200 eggs per egg mass. Within six to eight hours of being laid, eggs hatch into larvae (maggots) (Figure 4), which then burrow further into wounds as they feed with their hook-like mouth parts. As larvae continue to feed, the wound can worsen, attracting more egg-laying flies. Larvae will continue to feed for approximately seven days before dropping to the ground to burrow into the soil and pupate. Depending on the temperature and humidity, adult flies will emerge from the soil seven to 54 days later. Adult NWS flies tend to prefer forest margins near pastures and potential hosts.

A Similar Species: Secondary Screwworm

A related species, the secondary screwworm (*Cochliomyia macellaria*), is commonly found throughout the U.S. Unlike NWS, secondary screwworms typically infest wounds or tissues that are already dead, rather than living tissue; thus, this secondary species is considered to be a beneficial decomposer. It is possible that both NWS and secondary screwworm could be found together in a wound. NWS larvae are larger and have more robust mouth hooks with distinctive dark pigmentation, while secondary screwworm larvae are smaller, paler, and have less pronounced mouth hooks, which helps differentiate the two species during identification. While secondary screwworms do not pose the same aggressive threat to livestock and wildlife as NWS, their presence can complicate wound healing and may be mistaken for NWS infestations during surveillance efforts. Because the two species appear quite similar, it's important to report any infestations as directed below.

Figure 4: *New World screwworm larva (Credit: USDA)*

What Can You Do?

1. **Monitor Livestock:** Regularly inspect animals for signs of infestation, such as unexplained wounds, maggots in wounds, foul odors or behavioral changes. Specifically, keep an eye out for:
    - Wounds or body openings (such as nose, ears, umbilicus, or genitalia) that are draining or enlarging
    - Maggots in wounds
    - Animals that appear depressed, go off feed and/or separate themselves from the herd
    - Know that NWS can burrow deep into a wound and that NWS infested wounds often can have a very small external opening but expand greatly under the skin. While maggots of other necrophagous species of blow flies may be visible on the surface of the wound, NWS maggots will usually be deep in the freshest portions of the wound.
2. **Prompt Wound Care:** Treat all wounds promptly and maintain good hygiene to prevent infestations. Wounds as small as a tick bite can attract NWS flies to lay their eggs. Secondary infection can occur in NWS infested wounds. If left untreated, animals may succumb within one week of the onset of infestation. NWS-infested animals should be treated under the guidance of an accredited veterinarian and reported to APHIS and their state animal health official immediately. People who suspect they are infested with NWS should seek immediate medical treatment following the Centers for Disease Control and Prevention (CDC) guidelines.
3. **Import Responsibly:** Purchase animals from reputable sources and always quarantine new animals brought onto your property.
4. **Travel Cautiously:** If traveling internationally with pets, ensure they are inspected for screwworm according to USDA APHIS guidelines. Additionally, if you are in an NWS-infested area, be sure to check your vehicle for screwworm flies.
5. **Report Suspicious Cases:** If you think you have found a screwworm, report it immediately to your State Animal Health Official and APHIS office. This will allow APHIS and partner agencies to respond quickly and remove the screwworms before a population becomes established.
6. **Stay Informed:** The best defense is knowing what to look for and acting fast. The USDA and Tennessee Department of Agriculture will provide updates if the situation changes. For more information, visit the USDA's NWS website.

Commonly Asked Questions

- **Question: How far can adult flies fly?**
  - An adult screwworm can fly more than 12 miles, but it can travel further as larvae parasitizing animals.
- **Question: Which animal species are most affected?**
- All warm-blooded animals can become infested with this fly species; however, livestock and companion animals are of greatest concern. **Question: When will the NWS arrive in Tennessee?**
  - Unfortunately, we do not know if or when the NWS will arrive in Tennessee. This makes education and surveillance (staying aware and informed) critical to catching infestations early.
- **Question: What is Tennessee doing about this fly?**
  - The Tennessee Department of Agriculture is working closely with producers, University of Tennessee faculty and USDA APHIS to monitor for this fly. If you suspect NWS, contact the State Veterinarian's office at 615-837-5120 or the USDA Area Veterinarians in Charge at 615-517-2642. On weekends and evenings, please contact 866-536-7593. Suspicious cases will be evaluated, and samples may be submitted to the laboratory for confirmation. The Tennessee Department of Agriculture Animal Health Division will assist veterinarians with sample collection and submission.
- **Question: How will this impact my livestock?**
  - Continue to care for your livestock as for normal fly and tick control. Be aware and monitor your animals for potential infestations. Maintain good on-farm hygiene and biosafety practices. If animals become infested, contact the Tennessee Department of Agriculture as infestation not only stresses the animals, but it can lead to a decrease in meat and milk production and potentially animal death.

Links to More Information:

- **New World Screwworm:** aphis.usda.gov/livestock-poultry-disease/cattle/ticks/screwworm
- **Pest Alert: New World Screwworm:** aphis.usda.gov/sites/default/files/pest-alert-new-world-screwworm.pdf
- **New World Screwworm What You Need to Know:** aphis.usda.gov/sites/default/files/bro-new-world-screwworm.pdf

If you are a veterinarian or animal health official, below are links to USDA APHIS standard operating procedures for possible NWS detection.

- **Animals:** aphis.usda.gov/sites/default/files/aphis-sop-detection-nws-in-animals.pdf
- **Dogs:** aphis.usda.gov/sites/default/files/sop-detection-of-nws-in-dogs.pdf
- **National Veterinary Accreditation Program Training Screwworm Module:** aphis.usda.gov/nvap/training-modules#:~:text=-Module%2041:%20New%20World%20Screwworm,not%20play%20on%20mobile%20devices
- **Link to Pesticides to Potentially use against NWS:** aphis.usda.gov/sites/default/files/pesticides-for-nws.pdf

Online Resources Mentioned in the Text

- **New World Screwworm Outbreak in Central America and Mexico Current Distribution Map:** aphis.usda.gov/livestock-poultry-disease/cattle/ticks/screwworm/outbreak-central-america
- **CDC Myiasis Overview:** cdc.gov/myiasis/hcp/clinical-overview/index.html
- **USDA APHIS Dog Import Guidelines:** aphis.usda.gov/pet-travel/another-country-to-us-import/dogs
- **USDA APHIS New World Screwworm:** aphis.usda.gov/livestock-poultry-disease/cattle/ticks/screwworm

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