

NWS FLIES AND MAGGOTS: What They Look Like

The adult screwworm fly is about the size of a common housefly (or slightly larger), with orange eyes, a metallic blue or green body, and three dark stripes along its back. The name screwworm is thought to refer to the feeding behavior of the maggots as they burrow (screw) into the wound, feeding as they go like a screw being driven into wood. Maggots (larvae) cause extensive damage by tearing at the hosts' tissue with sharp mouth hooks. The wound can quickly become enlarged and deepened as more maggots hatch and feed on living tissue.



Mature larvae



Magnified mature larvae



Screwworm pupae

HOW TO SPOT AN INFESTATION

Fly with egg mass on wound



Close-up female fly, eggs, and maggots on wound



Severe screwworm myiasis on dog's neck



Infested deer with extensive tissue damage



NWS flies attracted to an animal wound



NWS INFESTATION: What To Look For

- Any warm-blooded animal (including birds and humans) with maggots in wounds or other body openings (like nose, ears, umbilicus, or genitalia) that are draining or enlarging.
- Animals that may have recently suffered from a wound or surgical procedure. Wounds as small as tick bites attract flies.
- Egg masses may be around or in the wound; larvae may be visible by the third day of infestation.
- Because they feed on live flesh, NWS maggots may burrow deep into wounds or openings, while other species of maggots may appear around the outer surface of the wound.
- Screwworm infestations are very painful. Animals may become depressed, stop eating, and separate themselves from other animals or people.
- Secondary infection may occur in an NWS-infested wound. Left untreated, animals may die within 1 week of being infested.

REPORT IT

Immediately report any suspicious wounds, maggots, or infestations to a local accredited veterinarian, your State Animal Health Official, or a USDA veterinarian.

Anyone may report suspected cases of screwworm. While most reports will likely come through veterinarians and diagnostic laboratories, we need everyone to be on the lookout. This disease is serious and can have catastrophic impacts on U.S. agriculture and animal and public health. Catching it early and eliminating it quickly is vital.

If you hear of or see anything you think could be NWS, we want to know about it. **Report it** right away to your local accredited veterinarian, State Animal Health Official, or a USDA veterinarian.

ATTENTION ACCREDITED VETERINARIANS!

You are **legally required** to report all diagnosed or suspected cases of a communicable disease to USDA and your State Animal Health Official. This requirement applies to any disease for which USDA has a control or eradication program in place and for any animal diseases not known to exist in the United States. (See 9 CFR 161.4 f, h for more detail.)

CONTACTS

- **STATE ANIMAL HEALTH OFFICIALS**
www.usaha.org/upload/Federal%20and%20State%20Health/STATE_ANIMAL_HEALTH_OFFICIALS.pdf
- **USDA-APHIS, VETERINARY SERVICES**
www.aphis.usda.gov/aphis/ourfocus/animalhealth/contact-us/sa_area_offices/vs-area-offices

To learn more about NWS, go to:
www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/cattle-disease-information/nws/new-world-screwworm

Front cover: (top) Screwworm larva with flesh-tearing mouth hooks; (bottom) sterile fly
Photo credits: Images in "NWS Flies and Maggots" are by COPEG. The third image in "How To Spot an Infestation" is by Winthorpe Marsden, Jamaican Ministry of Agriculture; the second and fourth images are by Samantha Gibbs, U.S. Fish and Wildlife Service. All other images in this brochure are by USDA employees.

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Issued January 2018

NEW WORLD SCREWWORM:

What You Need To Know



Report any suspected NWS cases to your State Animal Health Official or a USDA veterinarian!



Sterile fly

New World Screwworm (NWS) myiasis is a serious disease

that can affect livestock, pets, wildlife, and in rare cases, people.

It is a painful condition in which the larvae (maggots) of the NWS fly (*Cochliomyia hominivorax*) burrow into the flesh of a *living* animal. This causes serious, often deadly damage to the animal. The economic impact of NWS is also severe. During the 20th century, the presence of NWS cost the U.S. livestock industry more than \$100 million annually.¹

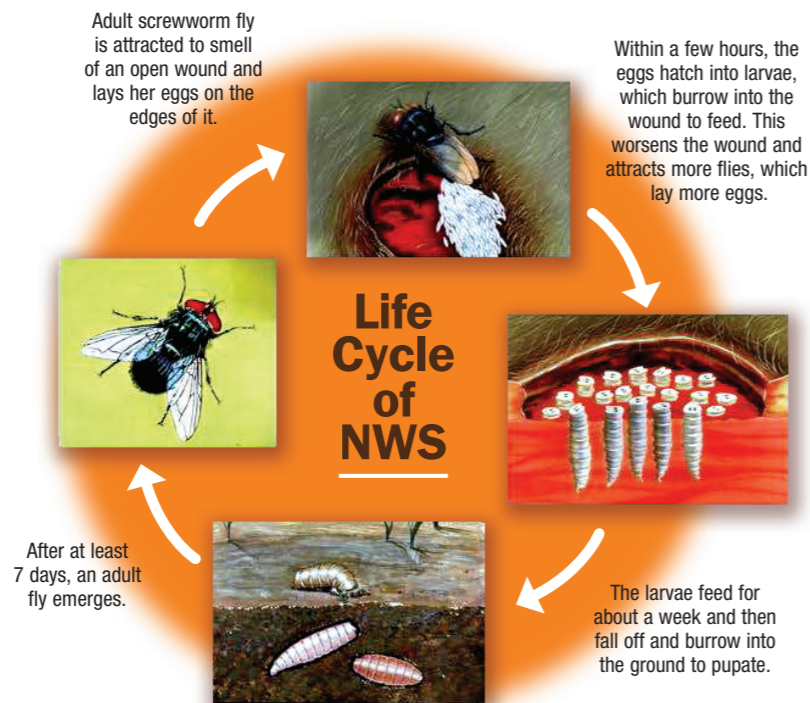
The flies spend most of their time in forests and other wooded areas, but will also seek host animals in pastures and fields if available. Open wounds attract the flies and are what they feed on and live in to survive.

The U.S. Department of Agriculture (USDA) needs your help to keep NWS out of our country. Read on to learn more about NWS, what an infestation looks like, and where to report possible cases of it. Together, we can protect the United States from this horrific disease.

INFESTATION: What Happens?

Screwworm infestations begin when a female fly lays eggs on a wound or orifice of a live warm-blooded animal. Female flies are attracted to the odor of a wound or opening such as the nasal or eye openings, umbilicus of a newborn, or genitalia. Wounds as small as a tick bite may attract a female to feed. One female can lay 200–300 eggs at a time and may lay up to 3,000 eggs during her 10- to 30-day lifespan.

Eggs hatch into larvae that burrow into the wound to feed on the living flesh. After about 7 days of feeding, larvae drop to the ground, burrow into the soil, and pupate. The adult screwworm fly emerges from the soil after 7–54 days depending on temperature and humidity. Female flies mate after 3 days, and males can mate within 24 hours of maturation.



Credit: Illustrations by USDA, Animal and Plant Health Inspection Service; text adapted from pp. 218–219 in *Atlas of Transboundary Animal Diseases* by Peter J. Fernández and William R. White (Paris: World Organization for Animal Health, 2010).

STERILE INSECT TECHNIQUE: How Does It Work?

To eradicate NWS, sterilized pupae may be placed in chambers at strategic locations throughout an infested area. Sterile flies may also be dispersed from aircraft over larger areas. As male flies emerge from the chambers, they seek out mates. Because female screwworm flies mate just once in their 30-day lifespan, the only eggs she will lay are not viable and will not develop into maggots. The population ultimately dies out as more sterile screwworm flies are released. The population of fertile screwworm flies dies off naturally over a few lifecycles.

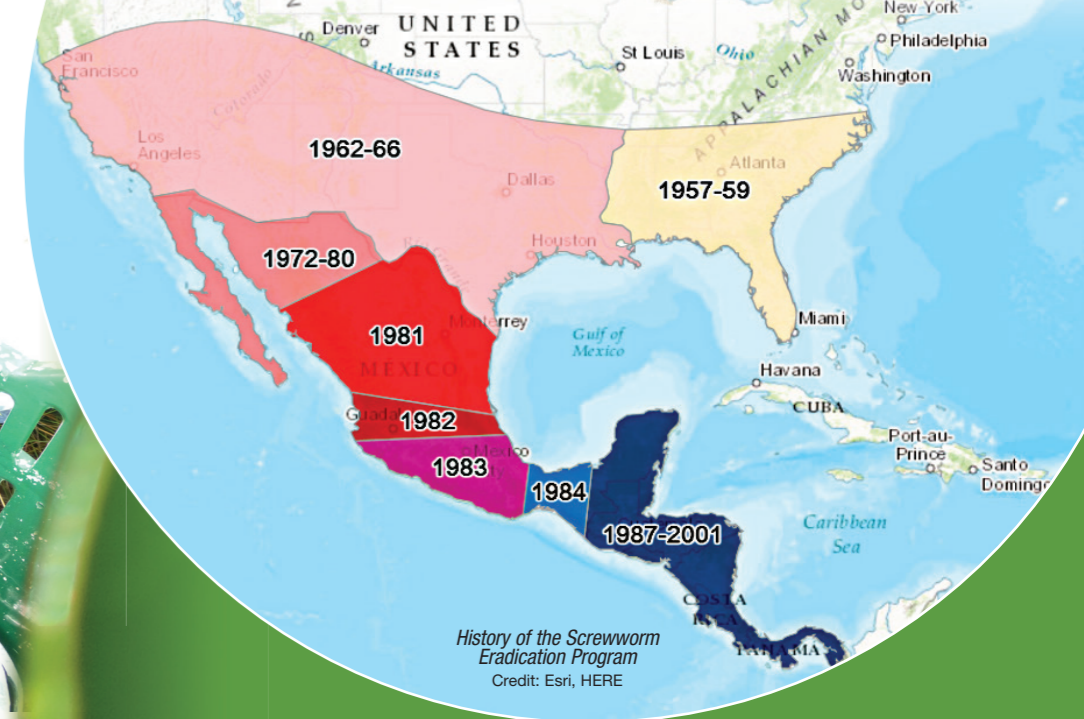
In October 2016, USDA and the Florida Department of Agriculture and Consumer Services announced the detection of NWS. It was successfully eradicated by March 2017 using this same method to eliminate screwworm from the United States once again. This was the first local infestation in the United States in more than 30 years and the first infestation in Florida in over 50 years.

NWS: What's the Impact?

Another incursion into the United States could cost millions of dollars from livestock losses, trade embargoes, and eradication work. Pets, livestock, wildlife, and even humans may suffer and die from screwworm myiasis.



Sterilized NWS pupae released in infested area



History of Eradication

An eradication program to remove NWS from the United States began in 1957. It used a biological control technique (sterilized insects) developed by USDA's Agricultural Research Service. This method is an ecologically safe and proven way to eradicate NWS fly populations by taking advantage of the fly's own biology. The sterile-insect approach eradicated NWS from the United States in 1966.

In a cooperative program, the Panama-United States Commission for the Eradication and Prevention of Screwworm (COPEG) maintains a permanent sterile fly barrier along the border of Panama and Colombia to prevent the re-establishment of screwworms.

2016–2017 NWS Outbreak: By the Numbers

- > **136** wildlife cases
- > **15%** of endangered Key Deer died from screwworm infestation
- > **9** domestic animal cases
- > Over **17,000** animals inspected at checkpoint leaving surveillance zone
- > More than **188 million** sterilized pupae placed in 35 sites over 6 months
- > Approximately **\$3.2 million** in taxpayer dollars spent on eradication efforts

¹ Novy, J.E. 1991. Screwworm control and eradication in the Southern United States of America. Special Issue of *World Animal Review* FAO, pp. 18–27. www.fao.org/docrep/U4220T/u4220T0a.htm