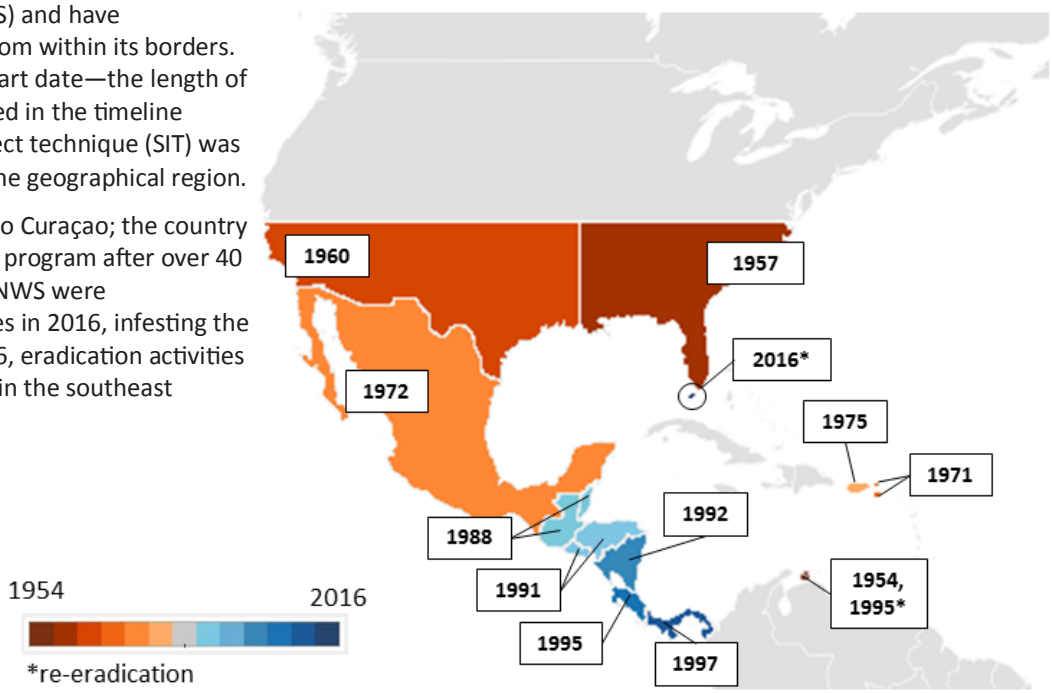
New World Screwworm Eradication Programs, by Start Date

The following map identifies countries that were infested with New World screwworm (NWS) and have successfully eradicated the pest from within its borders. This map indicates the program start date—the length of the eradication program is provided in the timeline below. In all cases, the sterile insect technique (SIT) was used to eradicate the NWS from the geographical region.

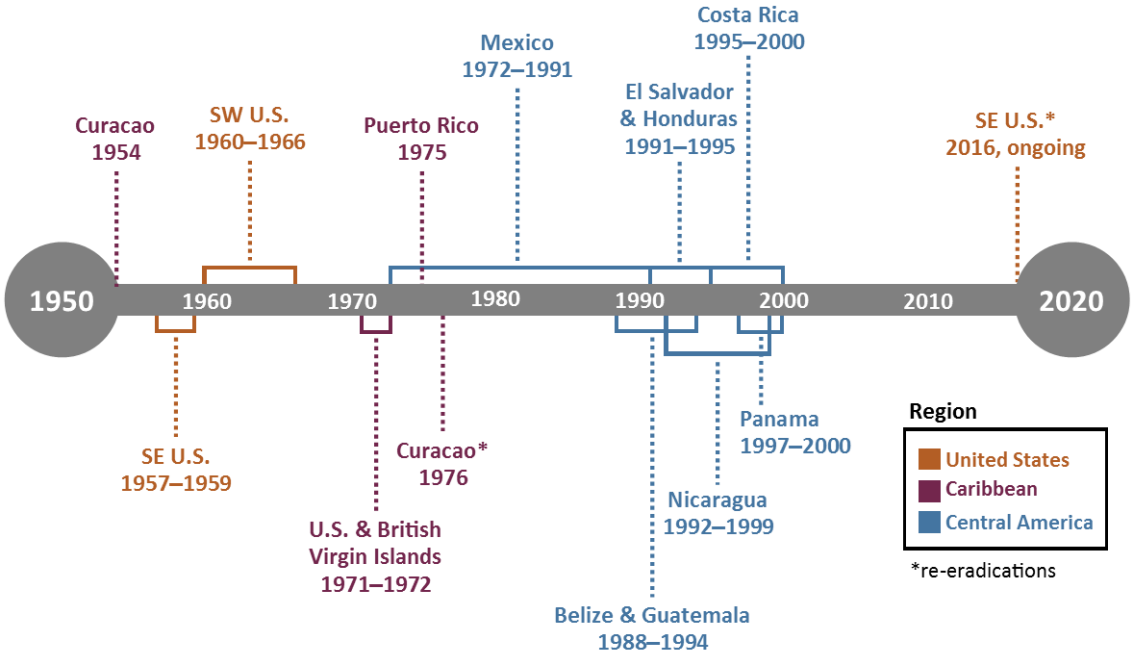
In 1995, NWS were reintroduced to Curaçao; the country mounted a second SIT eradication program after over 40 years of NWS freedom. Similarly, NWS were reintroduced into the United States in 2016, infesting the Florida Keys. As of November 2016, eradication activities continue in those islands, located in the southeast United States.

Panama, north of the Darien Gap, was the southernmost country to eradicate NWS in Central America. This Darien Gap area now serves as a "barrier" for NWS from entering Central or North America from South America.



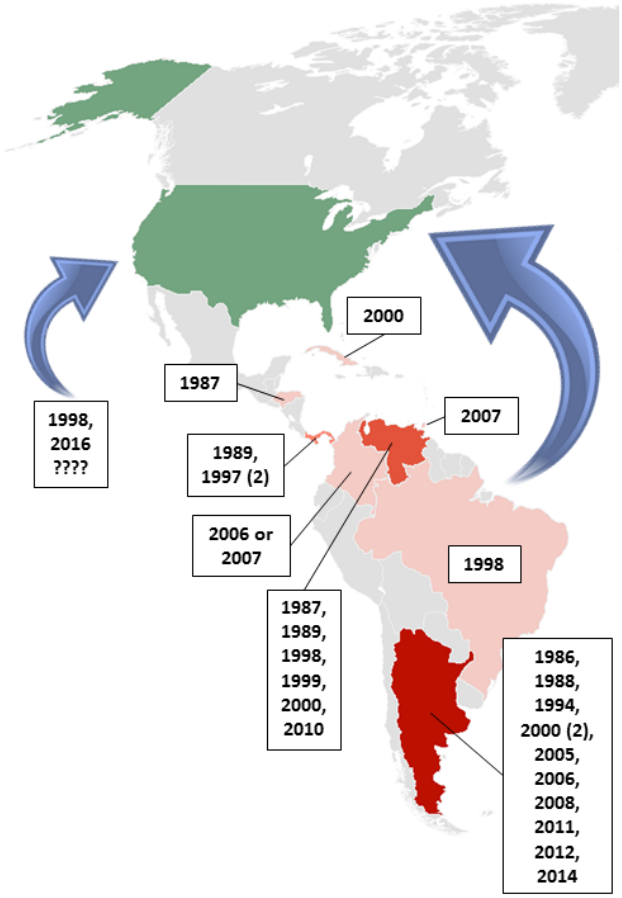
New World Screwworm Eradication Programs Timeline, by Duration

This timeline shows the length of NWS eradication programs which occurred in North America, the Caribbean, and Central America from the mid 1950's to the present. Curaçao was the first country to implement an SIT eradication program, and successfully eradicated NWS in 1954. The duration of any eradication program depends on many factors, including the geographical extent of the infestation, NWS status of neighboring countries, and the characteristics of the SIT eradication program (e.g., number of sterile flies that can be released). Please note that the official "NWS-free" date may be slightly after the dates pictured below.



Dates from Vargas-Teran et al. (2005). "Impact of Screwworm Eradication Programmes Using the Sterile Insect Technique." In Dyck et al. *Sterile Insect Technique: Principles and Practices in Area-Wide Integrated Pest Management,* 629-250.

Country of Origin for Recent New World Screwworm Detections into the United States



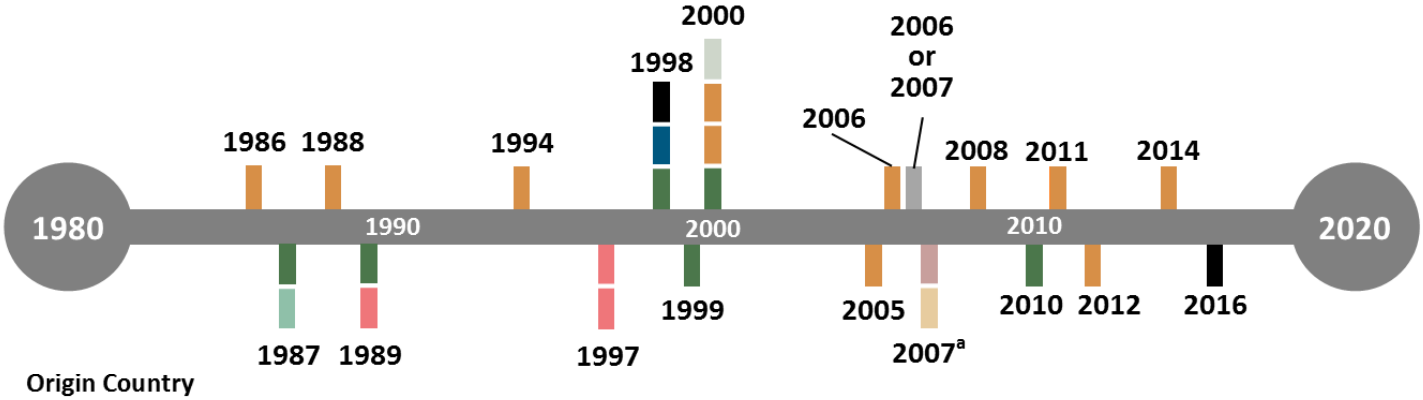
In the past three decades, NWS has been detected in the United States (including Puerto Rico) 27 times. In addition, there was a single U.S. detection of Old World Screwworm (OWS) from Singapore (not pictured at left). In many cases, the country of origin of the NWS detection is known because cases are detected in imported animals while they are in quarantine (13 of the 28 NWS/OWS detections were while in import quarantine). Three additional cases were in humans. But in two cases—1998 and 2016—the country of origin remains unknown. USDA is currently investigating the origin of the 2016 detection.

The map at left shows the country of origin for each U.S. NWS detection by year. The darker the red color of a country, the more recent the import of NWS into the United States. After the initial eradication of NWS in the United States throughout the 1950's and 1960's, subsequent NWS detections have resulted in only a single infested animal. Intensive surveillance efforts did not yield identification of further infestations. In three cases (including in the Puerto Rico case), out of an abundance of caution, sterile flies were released to ensure NWS did not re-establish in the United States (occurred in April 1987, August 1987, and September 1989).

However, this changed with the NWS introduction in 2016, when NWS again established itself in the United States. In part due to delayed identification, NWS infested a specific area in the Florida Keys. To-date, over 130 Key Deer have been affected, as well as approximately 5 domestic animals. While the country of origin (as of November 2016) is currently unknown, this introduction has resulted in an extended and continuing SIT eradication program against the established infestation in the Florida Keys.

New World Screwworm and Old World

This timeline provides another visualization of the data pictured in the map above; it illustrates U.S. NWS detections and the respective country of origin. One block represents one case. In two incidents, this origin country is unknown. The OWS detection from Singapore is also illustrated below.



[a]All NWS except 2007: one dog, OWS

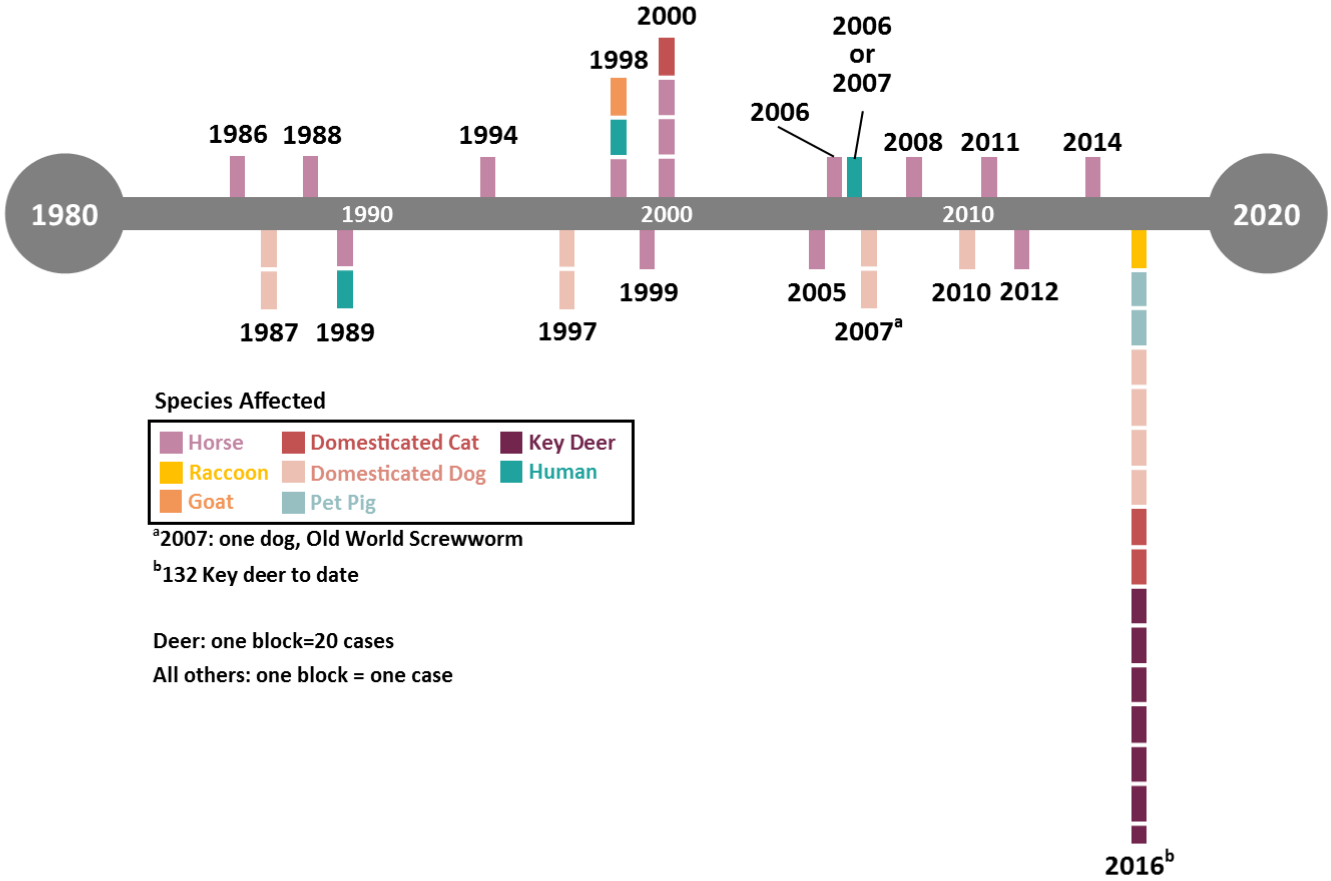
n=28
One block = one case

New World Screwworm and Old World Screwworm in the United States, by Species Affected (Presumptive and Confirmed Cases)

Historically, NWS has been detected in animals that have been recently imported into the United States. This timeline illustrates the species affected by NWS and OWS detections in the United States; it includes both presumptive and confirmed NWS and OWS cases. Both autochthonous and imported cases are shown below. Because of the geographical proximity of NWS to the United States, NWS is significantly more common than OWS. To-date, the 2007 case of OWS is the only known finding of an OWS larvae in the Western Hemisphere.

Three human detections are pictured; all individuals had recently traveled to an area with NWS. There has never been a NWS or OWS detection or introduction in livestock in the United States; horses and dogs are most commonly infested. All NWS and OWS detections in the United States have been traced back to imported animals or recent foreign travel for humans, except the 1998 case in a Texas goat and the current 2016 infestation. In 1998, while one larvae was identified as NWS, the animal had never been outside of the United States and no other cases were found or reported. There was no history indicating a likely source of the NWS. It remains unclear whether this was indeed NWS; this detection was not confirmed.

Then, in 2016, NWS has been detected in both wild and domestic animals in the infested area of the Florida Keys. Not yet tied to a country of origin, animals affected (presumptive or confirmed infestations) include domestic dogs, pet pigs, domestic cats, as well as wild Key Deer and a raccoon. The numbers illustrated below are current as of November 21, 2016, and may change.



The Darien Gap, Panama

The Darien Gap region of Panama is considered the "barrier zone" between South America, where NWS remains endemic and Central America/North America which is free from NWS. USDA APHIS International Services (IS) leads the operation of a sterile fly production facility within this region. This production facility is critical to 1) maintain this barrier zone in Central America, and 2) provide sterile flies as required by detections in NWS-free countries. It is currently providing the sterile flies for the 2016 response in the Florida Keys.