

# South Florida Ecosystem Restoration Task Force

## Invasive Exotic Species Strategic Action Framework

### *EDRR Case Study: New World Screwworm Fly*

The **New World screwworm fly** (NWSF), endemic to South America, poses a significant threat to livestock and other mammals. These invasive exotic flies lay larvae in open wounds; the resulting screwworms then feed on the animal's flesh, causing serious discomfort and itching. If left untreated, screwworm infestations can be fatal. A known parasitic pest, a recent occurrence of the NWSF in the Florida Keys spurred a successful Early Detection and Rapid Response (EDRR) interagency effort.

#### **A Coordinated EDRR Effort**

In September 2016, a multi-agency rapid response was initiated due to a positive detection of NWSF in an endangered key deer on the National Key Deer Refuge. NWSF had previously been eradicated in the southeast United States, including Florida, by 1960 (Novy 1991). Following its detection in the Lower Keys, a unified Incident Command System (ICS) structure was established between four primary agencies that included the Florida Department of Agriculture and Consumer Services (FDACS), the US Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS), Monroe County, and the US Fish and Wildlife Service (USFWS). It was later determined that the ICS strategy was essential to effectively managing the outbreak (Hennessey et. al. 2019).

#### **Successful Eradication**

Eradication was ultimately achieved using a multi-faceted approach that included mass sterile male fly releases (to reduce the likelihood that a fertile male fly will mate with a fertile female fly thus reducing the population); monitoring for disease spread; quarantine check points that included health inspections for domestic animals; containment and treatment of infected Key deer; euthanizing afflicted deer; proper disposal of deer carcasses; and community education and engagement (Hennessey et. al. 2019). Local volunteers provided invaluable assistance during the response.

The NWSF was declared eradicated on March 31, 2017, a mere seven months after its initial detection. Over 200

million sterile male flies were released on remote islands and in strategic locations on the mainland and over 17,000 animals received health checks (FDACS 2017). Roughly 15% of the endangered key deer population was lost (Hennessey et. al. 2019). Response costs likely exceeded \$5 million (Skoda et. al. 2018).

#### **Conclusion**

The coordinated effort was an excellent example of EDRR to a newly detected, highly invasive species, and the response met all criteria in the federal definition for an invasive species: 'an introduced species that is likely to cause economic or ecological harm, or is a threat to public safety'. There were direct risks to the Florida livestock industry, threatened and endangered species, and, although rare, cases of NWSF have been documented in humans. The source of the infestation remains unclear.



**New World Screwworm Fly (top) and mature larvae (bottom).**

Photos courtesy of USDA-APHIS.

## New World Screwworm Infestation: Before and After Treatment



Above, an active open wound infestation in an endangered Key deer.

Right, post-treatment with topical antibiotics.

Photos courtesy of USFWS.



### Sources:

Hennessey, M.J., Hsi, D.J., Davis, J.S., Delgado, A.H., Allen, H.A., Jandegian, C.M., Skoda, S.R., Watts, K.G., Gibbs, S.J., Powell, B., Welch, J.B., Phillips, P.L., Kitchen, D.L., Christy, G.S. and D.L. Bonilla. 2019. Special Report: Use of a multi-agency approach to eradicate New World screwworm flies from Big Pine Key, Florida, following an outbreak of screwworm infestation (September 2016-March 2017). *Journal of the American Veterinary Medical Association* 255 (8): 908-914.

Novy, J.E. 1991. Screwworm control and eradication in the southern United States of America. [Internet: Accessed 2016 Oct 20]. <http://www.fao.org/docrep/U4220T/U4220T0A.HTM>.

FDACS. 2017. Letter from Adam Putnam, Florida Commissioner of Agriculture, to Secretary of the Interior Ryan Zinke: Status of New World screwworm fly in the Florida Keys. Florida Department of Agriculture and Consumer Services (FDACS), Tallahassee, FL.

Skoda, S.R., Phillips, P.L. and J.B. Welch. 2018. Screwworm (Diptera: Calliphoridae) in the United States: Response to and elimination of the 2016-2017 outbreak in Florida. *Journal of Medical Entomology* 55(4): 777-786.