Salamander habitat sign at Fort Stewart (Erin Cork)

Hatching Hope:

HEADSTARTING TO CONSERVE THE FROSTED FLATWOODS SALAMANDER

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The frosted flatwoods salamander (*Ambystoma cingulatum*) is a remarkable and elusive species once widespread across the Coastal Plain's vast wetlands matrix. However, in the last few decades, populations have plummeted by over 90%, leaving only a handful of breeding sites that are the focus of a major conservation initiative. At the Fort Stewart-Hunter Army Airfield in coastal Georgia, biologists with the Amphibian and Reptile Conservancy (ARC) are working with partners including Georgia Department of Natural Resources to monitor and recover the last known population in the Atlantic Coastal Plain.

This past December, on a warm and rainy night, the first adult salamander recorded in Georgia in over 15 years was seen meandering through the grass – likely just having laid her eggs. Unfortunately, drought, disease, and predation mean less than 5% of those eggs live to reach metamorphosis. The few salamanders that survive through metamorphosis must migrate into the upland forests and survive several years before making the arduous trek back to breed.

The lone female observed was not only a sign that this wetland was occupied, but a "starting pistol" that signaled the onset of a busy nesting season. Assisted metamorphosis, or headstarting, is an important tool ARC uses to bolster populations by helping larvae through the most dangerous early stages of development. With this technique, ARC collects eggs from the wild and raises them until they are near metamorphosis. A team of biologists from ARC, the Fort Stewart Fish and Wildlife Branch, Georgia Department of Natural Resources, and numerous organizations systematically combed through patches of wetland plants in search of egg clusters. After a few weeks, over 300 eggs were collected and brought to a series of 250-gallon tanks, prepared with local vegetation and feeder plankton to mimic local conditions. After several months, 98% of the collected eggs hatched, developed legs, and were returned to their home pond.

Frosted flatwoods salamander larva {Erin Cork}

Salamander larvae ready for release {Erin Cork}

Mesocosm for rearing eggs {Devin Welch}

Frosted flatwoods female in situ after laying eggs {Kevin Hutcheson}

This small success story is the beginning of a greater conservation plan to recover and reintroduce the species to their historic range, using ecological forestry techniques to recover suitable habitat. Those familiar with the longleaf ecosystems recognize the importance of fire; however, they often overlook the impact of seasonally appropriate burns on wetlands. Historically, low-intensity fires in summer helped burn through the dry wetland basins, but many of today's prescribed burns occur in the winter months when wetlands are full or occur during the growing season when fuel/soil moisture is too high (out of concern for upland fire behavior) to carry fire through pond basins. This allows trees and shrubs to become established, altering hydrology and shading out potential breeding grounds. While conservationists are often daunted by the scale of widespread threats like drought and sea level rise, prescribed burning and thinning pine stands have immediate benefits for a wide range of imperiled flora and fauna.

ARC recently discovered new frosted flatwood salamander populations in Georgia and Florida and continues to survey the southeastern U.S. for any remaining populations. But if this salamander will ever be a conservation success story, it won't be from the work of a single organization. The Fort Stewart/Altamaha Longleaf Restoration Partnership prioritizes both the frosted flatwoods salamander and its habitat in its conservation plan and wants to work with stakeholders to support those efforts. The involvement of state and federal agencies, NGOs, and private forest landowners is critical to ensure a sustainable recovery of this iconic species across the landscape.