Cactus Moth Detection and Monitoring Network on Public and Private Lands in the United States. A partnership between USDA-APHIS, USGS, and Mississippi State University
Progress Report Template

Webpage: http://www.gri.msstate.edu/cactus_moth

*Introduction***.** Cactus moth (*Cactoblastis cactorum*), one of the most successful biological control agents in history, has been transported around the world in various prickly pear cactus control programs. By 2002, free-living populations of the moth had spread from the Florida Keys to the Florida Panhandle and South Carolina. It now poses a serious threat to native prickly pear cactus populations in the American Southwest, as well as the cactus industry and desert ecosystems in Mexico.

A research, extension, and coordination effort to monitor the spread and develop integrated control of cactus moth has been developed as part of collaborative research between USGS and Mississippi State University, with assistance from USDA-APHIS. This project has the following components: Early Detection and Reporting of Cactus Moth, Distribution of Prickly Pear Cactus, in the Region, Modeling of *Opuntia* Distribution, Cactus and Cactus Moth Extension Information, Web-Based Database of Cactus and Cactus Moth Locations, and Coordination

I. Early Detection and Reporting of Cactus Moth. Task Description: Cactus moth detection techniques will be tested to find an optimal approach for detection, and a network of detection sites at known cactus locations will be implemented. The MSU insect collection will develop instructional information for potential volunteer monitors at the selected monitoring sites, and provide for moth species verification and vouchering.

Summary of Objectives:
1. Develop and test techniques for (a) detecting cactus moth infestations, (b) delimiting infested areas, and (c) determining effectiveness of control actions.
2. Develop a cactus moth detection network in the project area.
3. Develop protocols for monitoring native and ornamental cactus populations.
4. Develop protocols for reporting and verifying suspected cactus moth infestations.

Progress this month:
- Checked 32 pheromone traps and identified moths from Arizona (16 traps, nurseries, APHIS), South Carolina (11 traps, Charleston, APHIS) and Texas (3 traps, Padre Island NS), Puerto Rico (2 traps, APHIS). *Cactoblastis cactorum* present in traps from South Carolina and Puerto Rico.
- Conducted surveys of Opuntia in George Co. (residential) and Harrison Co. (DeSoto National Forest). No Cactus moths were present.

II. Distribution of Opuntia *in the Region.*
Task Description: MSU staff, natural resource agency professionals, and volunteers will be used to search for populations of *Opuntia* cactus in the region. Native cactus populations will be located using herbarium records, contact of federal, state, and NGO biologists, and surveys. The location and description of all *Opuntia* cactus populations in the region and of cactus moth monitoring sites will be placed on a web-accessible database, as part of extension efforts listed below.

Summary of Objectives:
1. Develop and test methods to locate and map populations of cactus in support of surveys to detect and delimit cactus moth infestations in the region
2. Utilize professionals and volunteers to survey cactus locations in the Southeastern region.

Progress this month:

- A visit to Horn Island on November 24-25 indicated that *Opuntia* were the liveliest plant species on the island. Considerable *O. humifusa* and *O. pusilla* were present on the eastern half of the island. However, *O. stricta* were observed in only one location, close to the pier just north of the ranger station. Those *Opuntia stricta* seemed to be fairly heavily impacted by the hurricane but were recovering nicely.
- Mapping in AR, MO, MS, and TN.
- Return trip to Dauphin Island, AL to conduct mapping and survey for cactus moth.
- Surveys for populations of *Opuntia* species were made in George, Greene, Harrison, Jackson, and Stone Counties, including Shepard State Park, The Old Fort Bayou South Natural Area, and along Highways 26, 49, 57, and 63. Populations were located on Highway 26 and DeSoto National Forest.

III. Modeling of Opuntia *Distribution in the Region.*
Task Description: We will develop spatial models to predict cactus distribution in a GIS framework.

Summary of Objectives:
1. Develop cactus distribution prediction models

Progress this month:

- Continued model development and data collection.

IV. Cactus And Cactus Moth Extension Information.
Task Description: We will develop web-based information to aid in the identification of cactus and the cactus moth.

Summary of Objectives:
1. Web-based educational materials on cactus and the cactus moth
2. Educational program on cactus moth, including on-line and printed fact sheets and brochures.

Progress this month:

- Brochures and PowerPoint presentation CD on the cactus moth were provided to Diane Tyrone, Wildlife Biologist at DeSoto National Forest, for future training of National Forest personnel.

V. Web-based database for cactus and cactus moth distribution.
Task Description: We will develop a web-based avenue for reporting suspected locations on the web, and web GIS database to display the movement of the moth and locations of natural cactus populations. Webpage: http://www.gri.msstate.edu/cactus_moth

Summary of Tasks:
1. Operational web database for locating and mapping cactus and cactus moth populations.

Progress this month:

- Maintenance of the CMDMN website and web maps.
- Prepared for testing and migrating to new release of ArcIMS and ArcSDE for the maps and data storage.

VI. Coordination.
Task Description: A collaborative project of this size involving multiple agencies requires a concerted effort to coordinate activities and agree on the tasks to be done and data to be collected.

Coordination activities this month:

- Participated in NBII ISWG teleconference
- Submitted poster abstract for the USGS Invasive Species Science Program review, Albuquerque, NM, 4-7 December 2006.

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