

FIRE ANT PREDATION ON WATERFOWL

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The National Audubon Society and the Texas General Land Office have concerns over the invasion of the red imported fire ant, *Solenopsis invicta* Buren., into the waterbird colonies along the Texas coast natural and man made "spoil" islands.

The red imported fire ant has been documented to feed on hatching eggs (Johnson 1961, 1962, Mount 1981, Mount et al. 1981). However, the impact of this ant behavior on egg clutch survival and nest density in fire ant-infested areas has remained undocumented. In the absence of this information, suppression programs using available control technology are not ecologically and economically justified. Programs using current technology provide only temporary suppression and require repeated applications. Discontinuation of treatments results in re-invasion of the ants to levels that may exceed those prior to initial treatment.

A pilot program was conducted to document the impact of the red imported fire ant suppression program, based on the use of the environmentally acceptable management tactics over time on 1) fire ant activity, 2) waterfowl survival during and after hatching.

Materials and Methods

Heavily infested islands at Rollover Pass in east Galveston Bay were selected for this pilot program. These islands are colonized by more than a dozen ground and shrub nesting water birds from March through August, including the great egret, great blue heron, olivaceous cormorant, snowy egret, Louisiana (tricolor) heron, roseate spoonbill, laughing gull, gull-billed tern and Forester's tern.

Treatment regimes were based on a preliminary fire ant survey and the geography of the four Rollover Pass islands. Island 1 and the eastern half of Island 4 were treated on 27 February and 29 September 1989 using the product, Logic® (fenoxycarb), an insect growth regulator, to maintain low levels of fire ant activity. Island 3 and the west half of Island 4 were left untreated and had high levels of fire ant activity.

Fire ant mound densities were estimated on 27 February 1989, but thereafter, relative foraging ant activity between treated and infested areas was monitored using olive oil-soaked index cards. Ten one-inch-square cards were positioned in a transect line across each island or island portion. The number of ants associated with each card was estimated after 0.5 to 24 hours of exposure.

During periodic visits, 6 or more randomly-selected, egg-containing waterfowl nests were marked

in treated and untreated areas. Numbers of marked nests containing chicks were determined during subsequent visits. Percent mortality was calculated from these sets of marked nests and observations were made to determine cause of death.

Results and Discussion (Note: Results presented here are preliminary, representing only two years of data)

A preliminary survey documented an estimated 180 mounds per acre on Islands 1, 3 and 4. Island 2 was found to harbor primarily a native ant species, *Monomorium minutum* Buckley, the little black ant. The effects of the 27 February 1989 Logic® treatments were not evident during the 1989 breeding season (**Table 1**).

Survey of nesting waterfowl on 23-24 May 1989 provided no indication of the impact of ants on hatching survival, although some hatchling chick were observed being attacked by red imported fire ants. During June 1989, hurricane Allison flooded the Rollover Pass Islands with a 5 ft. flood and 27 inches of rain. These adverse weather conditions eliminated bird nesting activities and all developing waterfowl. Hurricane Chantal produced 6 inches of rain on the islands on 1 August. Thus, no waterfowl developed on these islands in 1989.

On 21 April 1990, waterfowl nesting was already in progress preventing a spring broadcast application of ant bait. The 29 September 1989 Logic application to the eastern half of Island 4 had resulted in a 91.6 percent reduction in foraging activity. Heavy rains and floods occurred in May. On 1 June 1990, high tides had been occurring causing flooding conditions, and many laughing gull and tri-color heron nest had been submerged.

Although flood-related mortality of hatchling waterfowl was documented in April and May 1990, ant-related mortality on the infested portion of Island 4 was not documented until after June 1. Mortality increased to 100 percent of marked nests through the remainder of the monitoring period (**Table 2**).

Preliminary Conclusions

- Red imported fire ants can successfully be suppressed on rookery island of the Texas coast using an annual fall broadcast application of Logic® insect growth regulator.
- Fire ant-caused mortality of hatching waterfowl was not detected from April until the end of May and increased to 100 percent of monitored bird nests through the remainder of the nesting season. (July 20)
- Weather conditions play a major role in the ability of both birds and fire ants to successfully nest on these islands.

Literature Cited

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Table 1. Number of red imported fire ant workers associated with olive oil-soaked index card, Rollover Pass Islands, Texas.

Average no. foraging red imported fire ants per card-

Olive-oil card station	Treated Island 4E	Untreated Island 4W
23-24 May 1989	31.8	27.6
29 September 1989	14.0	18.1
21 April 1990	2.7*	27.9*
1 June 1990	0.2	180.0
10 July 1990	4.0	19.5

* The September 1989 Logic® application in a 91.6 percent reduction of fire ant foraging activity.

Table 2. Percent mortality of hatching waterfowl on fire ant treated and infested (untreated) part of Roll over Pass Island 4, Galveston Bay, Texas, 1990.

**Percent Mortality of hatchling waterfowl
(number of marked nest observations in parentheses)**

Date	Treated	Untreated
April 21*-May 6	14.3 (7)	50.0 (6)
May 6 - June 1	0.0 (4)	50.0 (4)
June 1* - June 15	10.0 (10)	--
June 15*-June 24	N/O	100.0 (?)
June 24*-July 3	N/O	100.0 (5)
July 3*-July 10	N/O	100.0 (3)
July 10-July 20	N/O	100.0 (3)

* Dates when sets of nest containing waterfowl eggs were marked for subsequent observation of hatching success.

N/O = Non observed

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