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# Protecting a Flower-loving Fly



**Female Delhi Sands flower-loving fly**  
Photo by Gilbert Goodlett/Thomas Olsen  
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In 1993, the Fish and Wildlife Service (FWS) issued a final rule protecting the Delhi Sands flower-loving fly (*Rhabdomidas terminatus abdominalis*), an insect, under the Endangered Species Act (ESA). Immediately, some in the media picked up on the listing and informed the world that the “Feds have gone crazy.” Calls from concerned citizens and reporters tied up phone lines for days after the listing was announced. Everyone wanted to know why the government would even consider protecting a mere “fly.”

The Delhi Sands flower-loving fly should not be confused with the common house fly. Although they belong to the same order, the two animals are strikingly different in appearance and behavior. The 1-inch (2.5-centimeter), orange and brown Delhi Sands flower-loving fly has feeding behavior similar to such species as the hummingbird and butterfly. It has a long tubular proboscis that it uses to extract nectar from flowers. The Delhi Sands flower-loving fly is a strong flier and, like the hummingbird, is capable of rapid rocket-like flight as well as stationary, hovering flight.

*Rhabdomidas terminatus* consists of two subspecies, the El Segundo flower-loving fly (*Rhabdomidas terminatus terminatus*) and the Delhi Sands flower-loving fly. The El Segundo subspecies is almost certainly extinct, having been confined to the El Segundo sand dunes and portions of the sandy alluvial plain of the Los Angeles River. The El Segundo sand dunes ecosystem has been virtually eliminated by urban development. The last known viable habitat for the El Segundo flower-loving fly was eliminated by construction for

the Los Angeles International Airport in the 1960's. Thus, the Delhi Sands flower-loving fly is the only living representative of its species.

The Delhi Sands flower-loving fly is a rare endemic insect currently restricted to only 12 known populations in the semi-arid sand dunes of southern California's San Bernardino and Riverside counties. Once more than 40 square miles in extent, the Colton Sand Dune system was the largest inland sand dune formation in this part of southern California. One of the most characteristic features of this biologically unique habitat type is the fine, sandy soils classified as belonging to the “Delhi” series. The fly's historical distribution extended from the eastern margin of the City of Colton in San Bernardino County to the western boundary of the unincorporated district of Mira Loma in Riverside County and from the foothills of the San Gabriel Mountains south into Riverside County. New populations have been discovered as far west as the City of Ontario in San Bernardino County. This distribution suggests that it once occurred throughout much of the 40 square miles of the Delhi series soils. But today, an estimated 98 percent of this habitat has been converted to residential, agriculture, and commercial uses.

The Delhi series habitats were a hot spots of biodiversity and, like some other plants and animals found there, the Delhi Sands flower-loving fly populations are now on the brink of extinction. The Delhi Sands flower-loving fly undergoes a complete metamorphosis (egg, larva, pupa, adult), but its precise life span is not known. The adults are active during August and September, a time typically referred to as

the flight period. The females possess specialized egg-laying organs used to lay up to 40 eggs in suitable sandy soil. The egg, larval, and pupal stages, which constitute the bulk of the animal's life history, are spent beneath the surface of the sand.

Over the last few years, the status of the Delhi Sands flower-loving fly has dramatically declined. The FWS listed it as endangered on September 23, 1993, citing habitat loss and degradation, trash dumping, and the use of agricultural pesticides as the primary threats to this species. These threats are expected to continue. Western Riverside County currently supports a population of about 800,000 people, and it is estimated that the population could reach 1.4 million people by 2010. Virtually all known populations of the Delhi Sands flower-loving fly occur on small, isolated remnants of habitat surrounded by incompatible land uses. Of the 12 known populations, all are threatened by pending developments and/or active project proposals. The largest known population occurs in a 350-acre (148-hectare) area largely owned by two sand and gravel mining companies. Due to its size, land use history, and ecosystem values (blowing sand and shifting dunes), the creation of a core reserve at this site could represent the last opportunity to save the Delhi Sands flower-loving fly from extinction. A reserve could be designed to withstand development and grading influences from the surrounding land uses without the use of intensive management. Incidentally, the site falls within the State-designated Agua Mansa Enterprise Zone, which confers significant tax and other economic incentives for commercial development.

The FWS has completed a recovery plan for the Delhi Sands flower-loving fly. The plan recommends that three recovery units be established within the fly's historical range. The species' recovery will depend on the ability of the FWS to work effectively with private land owners to preserve and enhance



**Male Delhi Sands flower-loving fly**

Photo by B. Moose Peterson/WRP©

currently occupied habitat and implement a habitat restoration program.

The FWS is working with local agencies and private parties to save the species and its unusual habitat. If this effort is not successful, another creature will disappear from southern California forever. Some people will not miss the Delhi Sands flower-loving fly, but they may very well miss the other plants and animals that depend upon the important ecological role this unique insect plays. The complex and delicate web of interrelationships among plants, animals, and their environments are still relatively unknown and the subject of much research. It has been estimated, however, that the disappearance of even one species in an ecosystem can cause a chain reaction that can trigger the extinction of up to 30 other species. The more we know and understand about our environment, the better equipped we will be to conserve our natural resources, including those whose importance is not always evident.

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