

Native flies go on protected list

By Christie Wilson

Advertiser Neighbor Island Editor

Hawai'i's lengthy list of endangered and threatened species got even longer yesterday with federal protection extended to 12 species of Hawaiian picture-wing flies, tiny insects with a giant reputation among those who study biology and evolution.

"They appear in many biology textbooks as a classic example of ... evolution, and it would be a shame that a group of flies that are so well-known to the wider public would be threatened with extinction," said ecologist David Foote of the U.S. Geological Survey, who has been studying the flies since 1992.

There are about 106 known species of Hawaiian picture-wing flies, each evolving in isolated habitats requiring unique adaptations.

The U.S. Fish and Wildlife Service listed 11 of these species as endangered and one as

threatened under the Endangered Species Act. Each is found only on a single island, and each breeds only on a single or a few related species of plants, some of which also are threatened or endangered. Six of the picture-wings are found on O'ahu, three on the Big Island and one each on Kaua'i, Moloka'i and Maui.

Hawai'i has 350 plant and animal species listed as endangered or threatened — roughly a quarter of the nation's federally protected species.

Genetic research indicates Hawaiian picture-wing flies, relatives of the fruit fly, evolved from ancestors that lived on Kaua'i 5 million years ago. They are known as "the birds of paradise" of the insect world for the elaborate markings on their translucent wings and for their flamboyant courtship and territory-defense behaviors.

"Many of the 12 listed insects have been extensively studied," Foote said. "They are a wonderful example of how species form as a consequence of island-hopping

and mating systems. They exhibit dramatic behavior and bizarre head shapes, and have a very wonderful manner of expressing themselves when you see them in the field."

Brent Plater of the Center for Biological Diversity in San Francisco called Hawaiian picture-wing flies "the cornerstone of our understanding of the process of evolution."

He said yesterday's announcement in the Federal Register was five years overdue and arose from a federal lawsuit filed by the Center for Biological Diversity that accused the Fish and Wildlife Service of failing to move ahead in granting the flies protected status and identifying critical habitat after initially proposing listing in 2001.

A settlement reached in the case in August requires Fish and Wildlife to propose critical habitat areas for the 12 species by Sept. 15 and to finalize a critical habitat plan by April 17, 2007.

Ken Foote of the Fish and

Wildlife Service, who is not related to David Foote, said it is too early to tell whether privately owned land will be included in the critical habitat proposal. Much of the picture-wing habitat is in national parks, refuges and upland forest areas already under protection.

Plater said he doesn't expect the critical habitat for the picture-wings to encroach "on massive private land holdings, and if it does, it will be relatively small."

Major threats to the 12 newly listed species are habitat damage by feral pigs and goats, loss of host plants, and non-native insect predators and parasites, including ants, yellowjackets and wasps.

Scientists have noted declines in specific picture-wing populations, some of which have disappeared altogether.

"It's getting more and more difficult to relocate populations identified in the 1970s and 1980s," David Foote said. "This is great cause for concern to biologists working on these picture-wings. When you can't find them, a red flag goes up."

He said that aside from their fascinating characteristics, the flies are part of "the forest floor litter system" and play a role in regulating decomposition by consuming bacteria and fungi.

They also are indicators of the health of the entire ecosystem, he said.

"If you have large numbers of

species that are disappearing from large native forests, that's an indication that you're not doing a good job of protecting these forests," he said.

Scientists marvel at the diversity among picture-wing species, despite their common ancestry. The Big Island 's *Drosophila heteroneura* has large spots on the base of its wings, and males have a broad yellow head with the eyes situated on each end, giving them a hammerhead appearance.

The male of another species, Maui's *Drosophila neoclavisetae*, attracts females by bending its abdomen up over its head and producing a bubble of liquid believed to be a sex pheromone. The fly vibrates its abdomen to fan the scent toward females. Other species buzz their wings at a specific pitch to signal mates, while still others taste tongues.

Rival males in one species butt heads like bighorn sheep. In another species, males wrestle while holding each other's legs and wings. Still another species uses noise to intimidate challengers by generating a loud buzzing with its abdomen muscles.