

**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****50 CFR Part 17**

RIN 1018-AG23

**Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for 12 Species of Picture-wing Flies From the Hawaiian Islands****AGENCY:** Fish and Wildlife Service, Interior.**ACTION:** Proposed rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), propose endangered status pursuant to the Endangered Species Act of 1973, as amended (Act), for 12 species of Hawaiian picture-wing flies—*Drosophila aglaia*, *D. differens*, *D. hemipeza*, *D. heteroneura*, *D. montgomeryi*, *D. mullia*, *D. musaphilia*, *D. neoclavisetae*, *D. obatai*, *D. ochrobasis*, *D. substenoptera*, and *D. tarphytrichia*. These species are found on one or more of the following Hawaiian Islands: Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i. These 12 species face substantial threats from one or more of the following: habitat degradation, loss of host plants, biological pest control, and predation from alien arthropods. Due to the restricted distributions and small populations, three species (*D. heteroneura*, *D. mullia*, and *D. neoclavisetae*) are in danger of extinction from naturally occurring random events. This proposal, if made final, would implement the protection provisions provided by the Act for these Hawaiian picture-wings.

**DATES:** Comments from all interested parties must be received by March 19, 2001. Requests for public hearings must be received by March 5, 2001.

**ADDRESSES:** If you wish to comment, you may submit your comments and materials concerning this proposal by any one of several methods.

(1) You may submit written comments to the Field Supervisor, U.S. Fish and Wildlife Service, Pacific Islands Office, P.O. Box 50088, Honolulu, HI 96850-0001.

(2) You may send comments by e-mail to [pwflies\\_pr@fws.gov](mailto:pwflies_pr@fws.gov) (see

**SUPPLEMENTARY INFORMATION** for file formats and other information about electronic filing); or

(3) You may hand-deliver comments to our Pacific Islands Office at 300 Ala Moana Blvd., Room 3-122, Honolulu, HI.

Comments and materials received, as well as supporting documentation used

in the preparation of this proposed rule, will be available for public inspection, by appointment, during normal business hours at the above address.

**FOR FURTHER INFORMATION CONTACT:** Paul Henson, Field Supervisor, at the above address (telephone 808/541-3441, facsimile 808/541-2756).

**SUPPLEMENTARY INFORMATION:****Background**

Many of the major ecological zones of the earth are represented in Hawai'i, from coral reef systems through rain forests to high alpine deserts, in less than 10,800 square kilometers (6,500 square miles) of land. The range of topographies creates a great diversity of climates. Windward (northeastern) slopes can receive up to 1,000 centimeters (cm) (400 inches (in.)) of rain per year, while some leeward coasts that lie in the rain shadow of the high volcanoes are classified as deserts, receiving as little as 25 cm (10 in.) of rain annually. This topographic and climatic regime has given rise to a rich diversity of plant communities, including coastal, dryland, montane, subalpine, and alpine; dry, mesic, and wet; and herblands, grasslands, shrublands, forests, and mixed communities (Gagne and Cuddihy 1990). These habitats and plant communities in turn support one of the most unique arthropod faunas in the world, with an estimated 10,000 endemic species (Howarth 1990). Unusual characters of the arthropod fauna of Hawai'i include the presence of relict species; the absence of social insects, such as ants and termites; endemic genera; extremely small geographic ranges; adaptation of species to very specific conditions or environments; novel ecological shifts; flightlessness; and loss of certain antipredator behaviors (Zimmerman 1948, 1970, Simon *et al.* 1984, Howarth 1990).

Perhaps the most remarkable group of Hawaiian insects, and that which most typifies insect evolution in Hawai'i, is the flies in the family Drosophilidae (Williamson 1981). To date, 511 species of Hawaiian Drosophilidae have been named and described. An additional 250-300 species are already in the collection at the University of Hawai'i and await identification and description, and new species are still being discovered from localities not previously sampled. It is estimated that as many as 1,000 species may be present in native Hawaiian ecosystems (Kaneshiro 1993). The Drosophilidae family in Hawai'i represents one of the most remarkable cases of specific

adaptation to local conditions that has been found in any group of animals over the entire world (Hardy and Kaneshiro 1981). They are distributed throughout the high islands of the Hawaiian archipelago, each species displaying not only a highly characteristic trait of being found only on a single island, but also extraordinary physical diversity and adaptations that show their intimate ecological relationship to the native flora (Carson and Yoon 1982).

Drosophilidae are similar in structure to other flies in that adults have three main body parts: a head, thorax, and abdomen. A pair of antennae arises from the front of the head, between the eyes. The single pair of wings and three pairs of legs are attached to the thorax. The abdomen is composed of multiple segments. The general life cycle of Hawaiian Drosophilidae is typical of that of most flies: after mating, females lay eggs from which larvae (immature stage) hatch; as larvae grow they molt (shed their skin) through three successive stages (instars); when fully grown, the larvae change into pupae (a resting form) in which they metamorphose and emerge as adults.

The Hawaiian Drosophilidae have also developed and adapted ecologically to a tremendous diversity of ecosystems ranging from desert-like habitats where the soil is powdery dry, to rain forests with lush, tree-fern jungles, and in swampland perpetually shadowed by rain clouds and with vegetation burdened with dripping, moss-laden branches. While the larval stages of most species are saprophytic (feeding on decaying vegetation, such as rotting leaves, bark, flowers, and fruits), some have become highly specialized, being carnivorous on egg masses of spiders, or feeding on green algae growing underwater on boulders in streams. As a group, the Hawaiian Drosophilidae appear to be widespread and can be found in most of the natural communities in Hawai'i.

Unlike most Hawaiian insects that remain obscure, typically known only from their original taxonomic descriptions, most aspects of Hawaiian Drosophilidae biology have been researched, including their internal and external morphology, behavior, ecology, physiology, biochemistry, the banding sequence of giant chromosomes, as well as detailed analyses of the structure of the DNA molecules. More than 80 research scientists and over 350 undergraduates, graduate students, and post-doctoral fellows have participated in research on the Hawaiian Drosophilidae, resulting in over 600 scientific publications on the biology of these flies. The Hawaiian Drosophilidae

is arguably the most intensively studied group of all terrestrial Hawaiian organisms.

Research on Hawaiian Drosophilidae has resulted in the development and testing of new theories of evolutionary biology (Bradley *et al.* 1991, Carson 1971, 1982a, Kaneshiro 1976, 1980, 1987, 1989). Ideas on the development of species and island evolution developed from studies on Hawaiian Drosophilidae are now referenced in most modern textbooks of biology and evolution (*e.g.*, Ridley 1993). These flies have also been the subject of numerous television programs produced by the BBC (British Broadcasting Corporation), NOVA, National Geographic Society, and other educational film makers. The BBC, in conjunction with the Open University in England, has also produced several programs focused on the research of the Hawaiian Drosophilidae, and these programs are being used in educational courses about evolution.

The Hawaiian *Drosophila* Project at the University of Hawai'i has coordinated and cooperated in most of the research on the Hawaiian Drosophilidae. It has also maintained extensive collection records of these species. These records form the basis for much of the data used to develop this proposed rulemaking. Three decades of collection work are maintained in permanent files of the Hawaiian Drosophila Project within the University of Hawai'i's Center for Conservation Research and Training. Also, collection

notes of the individual researchers on the project contain extensive records of host plant associations of most of these species. Understanding the host plant association is important due to the fact that all of these flies appear to be closely linked with one or more particular host plant species. These host plant species provide necessary habitat requirements for the flies, including shelter, food, and areas for courtship. The host plants, and suitable habitat for the host plants, are absolutely essential for the flies' survival and recovery.

Biologists have observed a general decline of the Hawaiian Drosophilidae along with other components of the native ecosystem. As noted by Spieth (1980), during the early part of the century, the Tantalus area behind the city of Honolulu was the major spot for collecting *Drosophila* species. By 1963, the majority of the native *Drosophila* species in this area had been exterminated, apparently due to intrusion of exotic vegetation and predation by ants. Quantitative sampling since 1971 has demonstrated dramatic declines in the abundance of some species and in other cases local extirpations (Foote and Carson 1995). A review of the data collected by the Hawai'i Drosophila Project and assessment of the threats to remaining populations suggests that at least 12 species of these flies are presently threatened with extinction.

All 12 species in this proposed rulemaking belong to the species group commonly known as the picture-wings

*Drosophila*. This group consists of 106 known species, most of which are large with elaborate markings on otherwise clear wings of both sexes, the pattern of which varies among species (Hardy and Kaneshiro 1981, Carson 1992). The picture-wing *Drosophila* have been referred to as the "birds of paradise" of the insect world because of the males' extremely elaborate and spectacular courtship displays and territorial defense behavior. Males occupy territories that serve as mating arenas to which receptive females are attracted for mating. The males fight among themselves for the best territories and establish a dominance hierarchy like some birds and mammals. Native Hawaiians apparently did not differentiate among the different species, but referred to flies collectively as *nalo*. Recognizing that some or all of these species may belong in the genus *Idiomyia* (Grimaldi 1990), we accept the most recent taxonomic description of the Hawaiian taxa as *Drosophila* (Nishida 1994) and will refer to the species in this proposed rule collectively as "Hawaiian picture-winged *Drosophila*," or "Hawaiian picture-wings." There has also been no traditional Hawaiian or European use of common names for individual species of Hawaiian picture-wings.

Each species of Hawaiian picture-wing in this proposed rulemaking is found only on a single island, and each breeds only in a single or a few related species of plants (see Table 1).

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF THE PROPOSED SPECIES

Species	Kaua'i	O'ahu	Moloka'i	Mau'i	Hawai'i	Primary host plants
<i>Drosophila aglaia</i>	.....	current .....	.....	.....	.....	<i>Urera glabra</i> (ōpuhe)
<i>Drosophila differens</i>	.....	current .....	.....	.....	<i>Clermontia</i> spp. (ōhā wai).	
<i>Drosophila hemipeza</i>	.....	current .....	.....	.....	.....	<i>Urera</i> spp. (ōpuhe) and <i>Lobelia</i> spp. (ōhā)
<i>Drosophila heteroneura</i>	.....	.....	.....	.....	current .....	<i>Clermontia</i> spp., <i>Delissea</i> spp., and <i>Cheirodendron</i> spp. (ōlapa)
<i>Drosophila montgomeryi</i>	.....	current .....	.....	.....	.....	<i>Urera Ka'ala e</i> (ōpuhe)
<i>Drosophila mulli</i> ..	.....	.....	.....	.....	current .....	<i>Pritchardia beccariana</i> (loulou)
<i>Drosophila musaphilia</i>	current .....	.....	.....	.....	.....	<i>Acacia koa</i> (koa)
<i>Drosophila neoclavisetae</i>	.....	.....	.....	current .....	.....	<i>Cyanea</i> spp. (hāhā)
<i>Drosophila obatai</i>	.....	current .....	.....	.....	.....	<i>Pleomele forbesii</i> (hala pepe)
<i>Drosophila ochrobasis</i>	.....	.....	.....	.....	current .....	<i>Myrsine</i> spp. (kōlea), <i>Marattia</i> spp. and <i>Clermontia</i> spp.
<i>Drosophila substenoptera</i>	.....	current .....	.....	.....	.....	<i>Cheirodendron</i> spp. and <i>Tetraplasandra</i> spp. (ōhe mauka)
<i>Drosophila tarphytrichia</i>	.....	current .....	.....	.....	.....	<i>Charpentiera</i> spp. (pāpala)

current = population observed within the past 20 years.

### Discussion of the 12 Species Proposed for Listing

#### *Drosophila aglaia*

*Drosophila aglaia* was first collected in 1946 on Mount Ka'ala on the island of O'ahu, and described by Elmo Hardy in 1965 (Hardy 1965). *Drosophila aglaia* is a small species, 4.0 mm (0.15 in.) in length, with wings 5.0 mm (0.2 in.) long. It has a yellow head that is approximately one-third wider than long. The eyes are brown, and the antennae are yellow, tinged with brown. The thorax is clear yellow with three broad brown stripes on the top, and the legs are yellow. The abdomen is brown with a large yellow spot on each of the hind corners. The wings are predominantly clear with irregular but characteristic brown markings, and are about two and three-quarter times longer than wide.

*Drosophila aglaia* is known only from six localities in the Wai'anae Mountains of O'ahu. It has been recorded on land owned by the State of Hawai'i Department of Land and Natural Resources (DLNR) at Makaleha Valley, Peacock Flats Trail, and Pu'u Kaua. Additionally, this species is known from private land holdings at Palikea Ridge, Pu'u Kaua, and Kalua'a gulch, and is also found on Federal land owned by the United States Army at Pu'u Pane. The occurrence of *D. aglaia* is restricted to the patchy distribution of its host plant, *Urera glabra*, a small endemic tree. The larvae of *D. aglaia* develop in the bark and stem of *U. glabra*. This tree does not form large stands, but is scattered throughout slopes and valley bottoms in mesic and wet forest habitat on all the main islands. In the Wai'anae Mountains on O'ahu, this tree occurs infrequently in mesic forest. Because *D. aglaia* is reliant on an infrequently occurring host plant, it is difficult to estimate the size of the land area on which this species occurs. Each site is probably less than several acres. The major threats to *D. aglaia* are predation by ants and habitat degradation from feral ungulates, alien plants, and fire.

#### *Drosophila differens*

*Drosophila differens* was described by Elmo Hardy and Kenneth Kaneshiro (1975) from specimens collected at South Hanalilolilo, Moloka'i, in 1972. Previous to the description, *D. differens* was referred to as "*Idiomya planitibia* from Moloka'i." This species is large, approximately 7.0 mm (0.3 in.) in length, with wings 8.3 mm (0.33 in.) long. *Drosophila differens* looks very similar to *D. planitibia* of Mau'i, but can be differentiated from *D. planitibia* by

its entirely or predominantly yellow face. There is also a difference in the markings found on the leading edge of the wings. In *D. planitibia* males, the marking extends about two-thirds the distance to the tip of the wings, while in *D. differens* males, it extends nearly to the marking at the tip of the wing. Hybridization experiments have demonstrated that *D. planitibia* from Mau'i and *D. differens* from Moloka'i represent distinct species as they are incapable of inter-breeding (Kaneshiro and Kaneshiro 1995). Crosses have been done in both directions and have resulted in fertile females, but sterile males. Other than differences in color, no morphological characters separate these species, and they are, therefore, considered to be sibling species.

*Drosophila differens* is restricted to the island of Moloka'i where it is known from three populations on private land: Kaunu O Hua, Pu'u Kolekole, and south Hanalilolilo where it was last observed on July 22, 1986. Montgomery (1975) found *D. differens* to breed in the bark, stems, and leaves of *Clermontia* spp. in wet rainforest habitat. This species is endangered by habitat degradation from feral ungulates and alien weeds, and predation by ants and alien wasps.

#### *Drosophila hemipeza*

Elmo Hardy (1965) described *Drosophila hemipeza* from specimens collected at Pūpūkea, O'ahu, in 1952. *Drosophila hemipeza* is most closely related to *D. planitibia* and *D. differens*. The key differences among these species is in the color of the face, which in *D. hemipeza* is pale yellow and densely covered with white fuzz. The thorax of *D. hemipeza* is predominantly yellow with two brown stripes on the top, and the legs are entirely yellow. This species is 5.0 mm (0.2 in.) long; the front legs are very slender with short straight bristles; and the wings are 6.0 mm (0.2 in.) in length, slender, and somewhat pointed.

*Drosophila hemipeza* is restricted to the island of O'ahu where it is known from six localities. In the Wai'anae Mountains, it is known from privately owned land at Palikea Ridge, Kalua'a Gulch, and Mauna Kapu. The species is also known from State of Hawai'i DLNR land in Makaleha and Wai'anae Valleys as well as from City and County of Honolulu holdings in Wai'anae Valley. The only occurrence of this species in the Ko'olau Range is from City and County of Honolulu property at Pauoa Flats on Mt. Tantalus.

Montgomery (1975) determined that *Drosophila hemipeza* utilizes several different mesic forest plants as larval breeding substrates. It breeds in the bark

of *Urera kaalae*, a Federal endangered species (56 FR 55770), in the stems of *Lobelia* spp., and in the bark and stems of *Cyanea* spp., in mesic forest habitat. This Hawaiian picture-wing is endangered by habitat degradation from feral ungulates, alien weeds, and fire, and predation by ants and alien wasps.

#### *Drosophila heteroneura*

R.C.L. Perkins described *Idiomya heteroneura*, based on specimens from 'Ōla'a on Hawai'i island (Perkins 1910). This taxon was later transferred to the genus *Drosophila* (Hardy 1969), forming its presently accepted name, *D. heteroneura*. *Drosophila heteroneura* has very large spots on the bases of the wings. However, the most characteristic feature of this species is the broad head of the male with the eyes situated laterally, thus giving it a hammer-head appearance. The hammer-head and entirely yellow face differentiate it from the closely related species, *D. silvestris*. The thorax is predominantly yellow with several black streaks and markings on top. The legs are yellow except for slight tinges of brown on the ends of the middle and hind femora and tibiae. The wings are hyaline (transparent) and are very similar in markings and venation to those of *D. silvestris*, except that the marking in the front margin of the wing of *D. heteroneura* extends nearly to the marking at the end of the wing. The abdomen is shining black with a large yellow spot on the top of each segment. This species is about 5.7 mm (0.22 in.) in length with wings approximately 7.0 mm (0.3 in.) long.

*Drosophila heteroneura* is restricted to the island of Hawai'i where it was historically known from 16 localities, on 4 of the island's 5 volcanoes (Hualālai, Mauna Kea, Mauna Loa, and Kilauea). This species has never been found on the Kohala Mountains. The species was believed to be extinct in the late 1980s, until it was rediscovered on private acreage at Hualālai Volcano in 1993. The remaining population is extremely small, with a 90 percent reduction from historical abundance (Kaneshiro and Kaneshiro 1995).

*Drosophila heteroneura* breeds primarily in the bark and stems of *Clermontia* spp. and *Delissea* spp., but it is also known to utilize *Cheirodendron* spp. in open rain forest habitat. This Hawaiian picture-wing is endangered by habitat degradation from ungulates and alien weeds, predation by ants and alien wasps, and an extremely small remaining population.

#### *Drosophila montgomeryi*

Named after Dr. Steven L. Montgomery in honor of his work on

Hawaiian picture-wings, *Drosophila montgomeryi* was described by Elmo Hardy and Kenneth Kaneshiro (1971) from specimens collected in the Wai'anae Mountains of O'ahu in 1970. This species morphologically appears to be most closely related to *D. pisonia* from the island of Hawai'i. It can be distinguished by the narrow, pale brown stripe on each side of the top of the thorax, the long hairs on the front legs, and the second antennal segment, which is yellow, tinged with brown on the top.

*Drosophila montgomeryi* is restricted to the Wai'anae Mountains on the island of O'ahu, where it is known from private holdings at Pu'u Kua and Kalua'a Gulch, and State of Hawai'i DLNR property at Pu'u Kua and Alaihehe Gulch. Montgomery (1975) reported that the larvae of this species feed in the decaying bark of *Urera kaalae*, which grows on slopes and in gulches of diverse mesic forest. This Hawaiian picture-wing is endangered by habitat degradation from feral ungulates, alien weeds, and fire, and predation by ants and alien wasps.

#### ***Drosophila mulli***

*Drosophila mulli* was described by William Perreira and Kenneth Kaneshiro (1990) and named for the eminent Hawaiian naturalist, William P. Mull, who first discovered this species. The head of *D. mulli* is yellow on the front, covered with a light, silvery grey fuzz. The face of the male is characteristically white, while that of the female is brown. The top of the thorax is brownish yellow and lacks conspicuous markings or stripes. The legs are predominantly yellow, and the front legs of males bear three distinct rows of long, curled hairs. The wings are two and one-half times longer than wide with distinct brown markings at the base and the tip. The length of the body is 4.3–5.0 mm (0.17–0.2 in.), and the wings are 4.3–4.8 mm (0.17–0.19 in.) long.

*Drosophila mulli* is restricted to the island of Hawai'i and is known only from the State of Hawai'i DLNR-owned 'Ōla'a Forest Reserve at an elevation of 985 meters (m) (3,200 feet (ft)). Adults are found only on the undersides of leaves of *Pritchardia beccariana*, an endemic fan palm, but the larval feeding site is still unknown. Attempts to rear this species from decaying parts of *P. beccariana* have been unsuccessful (W.P. Mull, Volcano, Hawai'i, pers. comm., 1995). However, because of the extremely localized population within a relatively small patch of *P. beccariana*, that a strong association between *D. mulli* and this plant is likely. This

Hawaiian picture-wing is endangered by habitat degradation from feral pigs and alien weeds, limited numbers, and predation by ants and alien wasps.

#### ***Drosophila musaphilia***

Elmo Hardy (1965) formally described *Drosophila musaphilia* from specimens at Kōke'e, Kaua'i, in 1952. Although Hardy (1965) indicated that *D. musaphilia* is very similar to *D. villosipedis*, based on both chromosomal data, as well as comparison of the male genitalia, *D. musaphilia* is clearly most closely related to *D. hawaiiensis* (Kaneshiro et al. 1995).

*Drosophila musaphilia* is characterized by a predominantly black thorax with gray fuzz and a very narrow gray stripe extending down the top. The legs are dark brown to yellow, with the front tibia devoid of ornamentation, and the tips of the legs have abundant long black hairs on top. The wings are three times longer than wide with characteristic markings of the *D. hawaiiensis* group. The abdomen is dark brown to black and densely covered with brown fuzz. The body length is about 5.0 mm (0.2 in.) and the wings 5.25 mm (0.207 in.) long.

*Drosophila musaphilia* is restricted to the island of Kaua'i where it is known from State of Hawai'i DLNR-owned land at Alexander Reservoir, Kōke'e State Park, and Halemanu. This species is extremely rare and has been observed only five times in the last 25 years. Montgomery (1975) determined that the host plant for *D. musaphilia* is *Acacia koa*. The females lay their eggs, and the larvae develop in the sap seeping from injured trees. This Hawaiian picture-wing is endangered by habitat degradation from feral ungulates, alien weeds, hurricanes, and fire, and predation by ants and alien wasps.

#### ***Drosophila neoclavistae***

*Drosophila neoclavistae* was described by William Perreira and Kenneth Kaneshiro (1990) from specimens collected at Pu'u Kukui, West Mau'i, in 1969. The species appears to be restricted to a ridge top at an elevation of 1,371 m (4,500 ft) (Kaneshiro and Kaneshiro 1995). It was named for its obvious affinities with *D. clavistae* from East Mau'i. Both species are similar in wing and thoracic markings as well as sharing one of the most bizarre courtship dances in the family. The male bends its abdomen up over its head, produces a bubble of liquid from its anal gland believed to be a sex pheromone, and then vibrates the abdomen, fanning the scent toward the female. Both *D. neoclavistae* and *D.*

*clavistae* are members of the *D. adiantola* species group (Perreira and Kaneshiro 1990), and, while other species in this group perform similar mating behaviors, they are highly exaggerated in *D. clavistae* and *D. neoclavistae*.

*Drosophila neoclavistae* is between 6.0–6.4 mm (0.2–0.25 in.) in length, with wings 6.5–7.0 mm (0.26–0.3 in.) long. It is distinguished by its amber brown head and yellow face, with the middle portion raised to form a prominent ridge. The thorax is predominantly reddish brown with a distinct brown median stripe, bordered on each side by two brown stripes. The legs are yellow, with brown on the femora and a distinct brown band on the tips of the tibiae. The wings are broad and rounded, more than twice as long as wide, and with the front portion covered with brown markings and large clear spots tinged light yellow. It shares with *D. clavistae* an extra crossvein in the wing, which sets both these species apart from the other species of the *D. adiantola* species group. The abdomen is dark brown and black with numerous long hairs on the hind segments of the male.

*Drosophila neoclavistae* is restricted to the island of Mau'i where it is known only from State of Hawai'i DLNR property at Pu'u Kukui. The host plant of this species has not yet been confirmed, although it is believed to be associated with *Cyanea* sp.. All collections of this species have come from within a small patch of *Cyanea* spp., and many other species in the *D. adiantola* species group utilize these and other plants in the family Campanulaceae. This Hawaiian picture-wing is endangered by habitat degradation from feral ungulates and alien weeds, limited numbers, and predation by ants and alien wasps.

#### ***Drosophila obatai***

*Drosophila obatai* was described by Elmo Hardy and Kenneth Kaneshiro in 1972, from specimens collected in the Wai'anae Mountains of O'ahu. This species was named for Mr. John Obata, who has made significant contributions to the study of Hawaiian *Drosophila* because of his knowledge of the native plants and habitats where these insects are found. *Drosophila obatai* resembles *D. sodomae* from Mau'i and Moloka'i, and is distinguished by small differences in wing markings and the black coloration of the abdomen.

*Drosophila obatai* is restricted to the island of O'ahu where it is known from State of Hawai'i DLNR-owned land at Makaleha Valley in the Moku'ia Forest Reserve in the Wai'anae Mountains, and

Wailupe Gulch located in the Honolulu Watershed Forest Reserve in the southern Ko'olau Mountains. This species is also known from Federal land owned by the Army at Pu'u Pane, and from City and County of Honolulu and private holdings at Wai'alaie Nui.

*Drosophila obatai* use *Pleomele forbesii* as a host plant (Montgomery 1975). This host plant, growing on slopes in dry forest and diverse mesic forest, occurs singly or in small clusters and does not form large stands of many individuals (Wagner et al. 1990). Threats to this Hawaiian picture-wing include habitat degradation from feral ungulates, alien weeds, and fire, and predation by ants and alien wasps.

### ***Drosophila ochrobasis***

*Drosophila ochrobasis* was originally described by Elmo Hardy and Kenneth Kaneshiro (1968) based on a specimen collected from Pu'u Hualalāi at an elevation of 1,692 m (5,550 ft). Based on chromosomal studies, *D. ochrobasis* appears to be most closely related to *D. setosimentum* (Kaneshiro et al. 1995).

Both the body and wings are approximately 4.6 mm (0.18 in.) in length. The head is yellow in front and brown on top, and the face is white with a prominent ridge running down the middle. The thorax is yellow except for a large brown spot on each side. The legs are yellow tinged with brown. In males, the basal three-fifths of the wing is predominantly clear to translucent with faint transverse streaks of brown. The outer two-thirds of the wing is dark brown with large clear spots similar to that portion of the wings in *Drosophila setosimentum*. The females of *D. ochrobasis* are virtually indistinguishable from those of *D. setosimentum* females.

*Drosophila ochrobasis* is restricted to the island of Hawai'i and has been found on State of Hawai'i DLNR property at Kīpuka and Alakahi Stream. It has also been observed at Kīpuka Pāhipa and Hualalāi, both of which are privately owned. *Drosophila ochrobasis* was collected almost every year from 1967 to 1975, sometimes in large numbers, but has now virtually disappeared (Kaneshiro and Kaneshiro 1995). It was last observed at Kīpuka on February 14, 1986. This species has been reported to utilize several host plants, including *Myrsine* spp., *Clermontia* spp., and *Marattia* spp. (Montgomery 1975). Threats to this Hawaiian picture-wing include habitat degradation from ungulates and alien weeds, and predation by ants and alien wasps.

### ***Drosophila substenoptera***

Elmo Hardy described *Idiomyia substenoptera* in 1965. He then later determined the genus *Idiomyia* to be synonymous with *Drosophila* (Hardy 1969), thus creating the current name of *Drosophila substenoptera*. This species is closely related to *D. planitibia* and other closely related flies (Kaneshiro et al. 1995) but is quite distinctive from all the other species in this group because of characteristic markings on the wings, the narrow wing shape, and the complex structures of the male genitalia. *Drosophila substenoptera* is predominantly yellow with two black stripes extending down the entire length of the top surface of the thorax. The legs are yellow and lack long hairs on the dorsal surfaces. Body length is 4.35 mm (0.171 in.), and the wings are 5.0–5.3 mm (0.2–0.21 in.) long.

*Drosophila substenoptera* is restricted to the island of O'ahu where it is known from the following private holdings: Wiliwili Nui Ridge, Castle Trail, Hālawā Ridge Trail, and Palikea Ridge.

*Drosophila substenoptera* is also found on State of Hawai'i DLNR property at Mt. Ka'ala and the DuPont trail as well as on City and County of Honolulu owned acreage at Ka'au Crater. This species has never been abundant at any of these locations, but now appears to be extant only on the summit of Mt. Ka'ala, despite intensive efforts to relocate it at other sites. Montgomery (1975) determined that this Hawaiian picture-wing breeds in the bark of *Cheirodendron* spp. and *Tetraplasandra* spp. trees in wet forest habitat. Threats to this species include habitat degradation from feral ungulates and alien weeds, and predation by ants and alien wasps.

### ***Drosophila tarphytrichia***

*Drosophila tarphytrichia* was described by Elmo Hardy (1965) from specimens collected from Mānoa Falls on O'ahu, in 1949. This species is closely related to *D. vesciseta* based on the structure of the male genitalia (Kaneshiro et al. 1995), but can be differentiated by distinct wing markings and the ornamentation of the front legs of the male. The thorax is almost entirely yellow to red with a tinge of brown on the top. The legs are yellow, with the tip of the front leg strongly flattened laterally and with a dense clump of black hairs. This species is 3.70 mm (0.148 in.) long with wings 4.0 mm (0.2 in.) long.

*Drosophila tarphytrichia* is restricted to the island of O'ahu where it was historically known from both the Ko'olau and Wai'anae mountain ranges.

It is now apparently extinct in the Ko'olau range and presently known from four localities in the Wai'anae Mountains. Three populations are found on privately owned lands at Mauna Kapu, Palikea ridge, and Kalua'a Gulch. The fourth is known from private and State of Hawai'i DLNR land at Pu'u Kāua. This species breeds on the stems and branches of *Charpentiera* spp. trees in mesic forest habitat (Montgomery 1975). Threats to this species include habitat degradation from feral ungulates and alien weeds, and predation by ants and alien wasps.

### **Previous Federal Action**

Ten of these proposed species were classified as candidates for listing in the February 28, 1996, Notice of Review of Plant and Animal Taxa That Are Candidates for Listing as Endangered or Threatened Species (Notice of Review) (61 FR 7596). The remaining two species, *Drosophila differens* and *D. ochrobasis*, were classified as candidates for listing in the Notice of Review dated September 19, 1997 (62 FR 49398). Candidates are those taxa for which the Service has on file substantial information on biological vulnerability and threats to support preparation of listing proposals.

The processing of this proposed rule conforms with our Listing Priority Guidance published in the **Federal Register** on October 22, 1999 (64 FR 57114). The guidance clarifies the order in which we will process rulemakings. Highest priority is processing emergency listing rules for any species determined to face a significant and imminent risk to its well-being (Priority 1). Second priority (Priority 2) is processing final determinations on proposed additions to the lists of endangered and threatened wildlife and plants. Third priority (Priority 3) is processing new proposals to add species to the lists. The processing of administrative petition findings (petitions filed under section 4 of the Act) is the fourth priority (Priority 4). The processing of this proposed rule is a Priority 3 action.

### **Summary of Factors Affecting These Species**

The procedures for adding species to the Federal Lists are found in section 4 of the Endangered Species Act (16 U.S.C. 1531 et seq.) and the accompanying regulations (50 CFR part 424). A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1). Threats to these 12 species are summarized in Table 2.

TABLE 2. SUMMARY OF THREATS TO 12 HAWAIIAN PICTURE-WING FLIES

Species	Threats							
	Major alien plants	Feral animal activity				Fire	Alien insects	Limited numbers*
		Pigs	Goats	Deer	Cattle			
<i>Drosophila aglaia</i> .....	1,2,3,6 .....	X	X	.....	.....	X	X	.....
<i>Drosophila differens</i> .....	2 .....	X	X	X	.....	.....	X	.....
<i>Drosophila hemipeza</i> .....	1,2,3,5,6 .....	X	X	.....	.....	.....	X	.....
<i>Drosophila heteroneura</i> .....	2,4,8,9 .....	X	.....	.....	X	.....	X	X
<i>Drosophila montgomeryi</i> .....	1,2,3,6 .....	.....	X	.....	.....	X	X	.....
<i>Drosophila mulli</i> .....	2,8,9 .....	X	.....	.....	.....	.....	X	X
<i>Drosophila musaphilia</i> .....	2,3,6,7,8 .....	X	X	X	.....	X	X	.....
<i>Drosophila neoclavisetae</i> .....	2,8 .....	X	.....	.....	.....	.....	X	X
<i>Drosophila obatai</i> .....	1,2,3,5,6 .....	X	X	.....	.....	X	X	.....
<i>Drosophila ochrobasis</i> .....	2,4,8,9 .....	X	.....	.....	X	.....	X	.....
<i>Drosophila substenoptera</i> .....	2,5,6 .....	X	.....	.....	.....	.....	X	.....
<i>Drosophila tarphytrichia</i> .....	1,2,3,5,6 .....	X	X	.....	.....	.....	X	.....

<sup>1</sup>-*Schinus terebinthifolius*    <sup>2</sup>-*Psidium cattleianum*    <sup>3</sup>-*Melinis minutiflora*    <sup>4</sup>-*Pennisetum setaceum*    <sup>5</sup>-*Clidemia hirta*    <sup>6</sup>-*Lantana camara*    <sup>7</sup>-*Rubus argutus*    <sup>8</sup>-*Passiflora mollissima*    <sup>9</sup>-*Rubus ellipticus*

\* Fewer than three populations

The five factors and their application to *Drosophila aglaia*, *D. differens*, *D. hemipeza*, *D. heteroneura*, *D. montgomeryi*, *D. mulli*, *D. musaphilia*, *D. neoclavisetae*, *D. obatai*, *D. ochrobasis*, *D. substenoptera*, and *D. tarphytrichia* are as follows:

#### A. The Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

Native vegetation on all the main Hawaiian islands has undergone extreme alteration because of past and present land management practices, including ranching, deliberate introduction of alien plants and animals, and agricultural development (Cuddihy and Stone 1990). Some of the primary threats facing the 12 Hawaiian picture-wing species proposed for listing are ongoing and threatened destruction and adverse alteration of habitat by feral animals and alien plants.

All 12 of the proposed species are endangered by feral animals to various degrees. The early human inhabitants of the Hawaiian Islands introduced Polynesian pigs (*Sus spp.*), and more recently European settlers introduced more ungulate species, such as goats (*Capra hircus*), axis deer (*Axis axis*), black-tailed deer (*Odocoileus hemionus*), cattle (*Bos taurus*), and other domesticated pigs (*S. scrofa*), for food, commercial ranching activities, and hunting. Over the 200 years following the introduction of these animals, their numbers increased, and the adverse impacts of these feral ungulates on native vegetation have become increasingly apparent. Beyond the direct effect of trampling and grazing native plants, these feral ungulates have contributed significantly to the heavy

erosion taking place on most of the main Hawaiian islands.

Pigs that were introduced to the Hawaiian Islands have escaped domestication and successfully established feral populations in wet and mesic forests and grasslands of Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i. Their presence on these islands threatens the existence of at least 11 of the proposed Hawaiian picture-wing species (see Table 2). Foote and Carson (1995) experimentally demonstrated the detrimental impact of feral pigs on Hawaiian picture-wings by showing that areas that had been fenced to exclude pigs supported higher numbers of flies and the plants they require for habitat. Conversely, areas of the same habitat that were not fenced were altered by pig-foraging activities resulting in the direct destruction of host plants. Furthermore, the foraging activities modified the habitat by making it more suitable for invasive plants that could crowd out host plants. While foraging, pigs root and trample the forest floor, encouraging the establishment of alien plants in the newly disturbed soil. Pigs also disperse alien plant seeds through their feces and on their bodies, accelerating the spread of alien plants through native forest (Cuddihy and Stone 1990, Stone 1985).

Goats native to the Middle East and India were first successfully introduced to the Hawaiian Islands in 1792. Feral goats now occupy a wide variety of habitats from lowland dry forests to montane grasslands on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i, where they consume native vegetation, trample roots and seedlings, accelerate erosion, and promote the invasion of alien plants (Stone 1985, van Riper and van Riper 1982). Goats are significantly degrading

the habitat of at least seven species proposed in this rule (see Table 2). On Kaua'i, goats contribute to the substantial decline of *Drosophila musaphilia*. On O'ahu, encroaching urbanization and hunting pressure tend to concentrate the goat population in the dry upper slopes of the Wai'anae Mountains, where populations of *D. aglaia*, *D. hemipeza*, *D. montgomeryi*, *D. obatai*, and *D. tarphytrichia* exist (Kaneshiro and Kaneshiro 1995). The goat population in the Wai'anae area is apparently increasing, becoming an even greater threat to the native habitat there. On Moloka'i, at least one population of *D. differens* at Pu'u Kolekole is presently endangered by goats.

Eight axis deer were introduced to the island of Moloka'i in 1868. By the turn of the century, their numbers had increased to thousands of animals (Tomich 1986). The herds had so damaged the vegetation on Moloka'i that professional hunters were hired to control their numbers (Tomich 1986). However, by then, the native vegetation had suffered irreparable damage from overgrazing by axis deer. These deer continue to degrade the habitat by trampling and overgrazing vegetation, which removes ground cover and exposes the soil to erosion. Activity of deer on Moloka'i has resulted in loss of habitat for *Drosophila differens*. The axis deer population is not presently managed by the State of Hawai'i DLNR or any other agency.

Black-tailed deer were first introduced to Kaua'i in 1961 for the purpose of sport hunting, and today probably number well over 500 animals. The deer are presently confined to the western side of the island, where they feed on a variety of native and alien

plants (van Riper and van Riper 1982). The presence of these deer on Kaua'i is endangering some *Drosophila musaphilia* habitat.

Large-scale ranching of cattle in the Hawaiian Islands began in the middle of the 19th century on the islands of Kaua'i, O'ahu, Maui, and Hawai'i. Large ranches, tens of thousands of acres in size, developed on East Maui and Hawai'i (Cuddihy and Stone 1990) where most of the State's large ranches still exist today. Degradation of native forests used for ranching activities became evident soon after full-scale ranching began. The negative impact of cattle on Hawai'i's ecosystem is similar to that described for goats and deer (Cuddihy and Stone 1990, Stone 1985). Cattle grazing continues in several lowland regions in the northern portion of the Wai'anae Mountains of O'ahu. On Maui, cattle ranching is the primary agricultural activity in many areas and presently threatens populations of *Drosophila heteroneura* and *D. ochrobasis*.

Most of the plants that serve as breeding sites for these proposed Hawaiian picture-wings occur as understory vegetation beneath the canopy of the *Metrosideros polymorpha* ('ohi'a) and *Acacia koa*, and are affected by competition with alien weeds. All of the 12 Hawaiian picture-wing species being proposed for listing are endangered by loss of host plants due to competition with one or more alien plant species. The most significant of these alien plants appear to be *Schinus terebinthifolius* (Christmasberry), *Psidium cattleianum* (strawberry guava), *Melinis minutiflora* (molasses grass), *Pennisetum setaceum* (fountain grass), *Clidemia hirta* (Koster's curse), *Lantana camara* (lantana), *Passiflora mollissima* (banana poka), *Rubus argutus* (prickly Florida blackberry), and *R. ellipticus* (Himalayan raspberry).

Many noxious alien plants, such as *Schinus terebinthifolius*, have invaded the dry to mesic lowland regions of the Hawaiian Islands. Introduced to Hawai'i before 1911, *S. terebinthifolius* forms dense thickets that shade out and displace other plants (Cuddihy and Stone 1990). This fast-growing tree or shrub is found in lowland areas of the major Hawaiian Islands and is currently expanding its range (Smith 1985). *Schinus terebinthifolius* is now a major component of the mesic forests of the Wai'anae and Ko'olau mountains of O'ahu and currently threatens the habitat of *Drosophila aglaia*, *D. hemipeza*, *D. montgomeryi*, *D. obatai*, and *D. tarphytrichia*.

*Psidium cattleianum*, an invasive shrub or small tree native to tropical

America, has become naturalized on all of the main Hawaiian islands. Like *Schinus terebinthifolius*, *P. cattleianum* is capable of forming dense stands that exclude other plant species (Cuddihy and Stone 1990). This alien plant grows primarily in mesic and wet habitats and provides food for several alien animal species, including feral pigs and game birds, which disperse the plant's seeds through the forest (Smith 1985, Wagner *et al.* 1985). *Psidium cattleianum* is considered one of the greatest alien plant threats to Hawai'i's rainforests. *Psidium cattleianum* is a major invader of forests in the Wai'anae and Ko'olau Mountains of O'ahu, where it often forms single-species stands. It poses a threat to all proposed species of Hawaiian picture-wings on O'ahu. *Psidium cattleianum* also threatens *D. musaphilia* on Kaua'i, *D. differens* on Moloka'i, *D. neoclavisetae* on Maui, and *D. heteroneura*, *D. mulli*, and *D. ochrobasis* on the island of Hawai'i.

First introduced to the Hawaiian Islands as cattle fodder, *Melinis minutiflora* (molasses grass) was later planted for erosion control (Cuddihy and Stone 1990). This alien grass quickly spread to dry and mesic forests previously disturbed by ungulates. *Melinis minutiflora* produces a dense mat capable of smothering plants (Smith 1985), essentially preventing seedling growth and native plant reproduction (Cuddihy and Stone 1990). Because it burns readily and often grows at the border of forests, this grass tends to carry fire into areas with woody native plants (Cuddihy and Stone 1990, Smith 1985). It is able to spread prolifically after a fire and effectively compete with less fire-adapted native plant species, ultimately creating a stand of alien grass where forest once stood. *Melinis minutiflora* is becoming a major threat to six of the proposed species on four islands. On Kaua'i it threatens the habitat of *Drosophila musaphilia*. In the Wai'anae Mountains of O'ahu, *M. minutiflora* threatens the habitat of *D. aglaia*, *D. hemipeza*, *D. montgomeryi*, *D. obatai*, and *D. tarphytrichia*.

*Pennisetum setaceum* has greatly increased fire risk in some regions, especially on the dry slopes of Hual'lai, K'lauea, and Mauna Loa volcanoes on the island of Hawai'i. The effects of *P. setaceum* invasion are similar to those discussed above for *Melinis minutiflora*. *Pennisetum setaceum* threatens the native vegetation on the leeward slopes of Hual'lai in a region where *Drosophila heteroneura* and *D. ochrobasis* occur.

*Clidemia hirta*, a noxious shrub native to tropical America, was first reported on O'ahu in 1941. It had spread through

much of the Ko'olau Mountains by the early 1960s, and spread to the Wai'anae Mountains by 1970 (Cuddihy and Stone 1990). It poses a serious threat to *Drosophila hemipeza*, *D. obatai*, *D. substenoptera*, and *D. tarphytrichia* by displacing native plants used by these Hawaiian picture-wings as breeding sites.

*Lantana camara*, a native of the West Indies, became naturalized in dry to mesic forests and shrublands of the Hawaiian Islands before 1871 (Cuddihy and Stone 1990). This shrub often forms thick cover and produces chemicals that inhibit the growth of other plant species (Smith 1985). On Kaua'i, *L. camara* is a major component of the vegetation around the east and west rims of Waimea Canyon and the western ridges, and threatens the habitat of *Drosophila musaphilia*. It poses a threat to all proposed species of Hawaiian picture-wings on O'ahu.

*Rubus argutus* was introduced to the Hawaiian Islands in the late 1800s (Haselwood and Motter 1976). The fruit and seeds of this plant are easily spread by birds to open areas where this plant can form dense, impenetrable thickets (Smith 1985). On Kaua'i, the habitat of *Drosophila musaphilia* is endangered by this noxious weed.

*Passiflora mollissima*, a vine in the passionflower family, was introduced to the islands in the 1920s, probably as an ornamental. This vine is extremely detrimental to certain wet forest habitats of Kaua'i, Maui, and Hawai'i. Heavy growth of this vine can cause damage or death to the native trees by overloading branches, causing breakage, or by forming a dense canopy cover, intercepting sunlight and shading out native plants below. This weed threatens *Drosophila musaphilia* on Kaua'i, *D. neoclavisetae* on Maui, and *D. heteroneura*, *D. mulli*, and *D. ochrobasis* on the island of Hawai'i.

A recent introduction to the Hawaiian Islands, *Rubus ellipticus* is rapidly becoming a major weed pest in wet forests, pastures, and other open areas on the island of Hawai'i. It forms large thorny thickets and displaces native plants. Its ability to invade the understory of wet forests enables it to fill a niche presently unoccupied by any other major wet forest weed in Hawai'i. This has resulted in an extremely rapid population expansion of this alien plant in recent years. *Rubus ellipticus* threatens the habitat of *Drosophila heteroneura*, *D. mulli*, and *D. ochrobasis*.

Fire threatens species of Hawaiian picture-wings living in dry to mesic grassland, shrubland, and forests on two islands. On Kaua'i, fire is a significant

threat to *Drosophila musaphilia*. Hurricane Iniki, in 1992, resulted in an enormous fuel load of downed woody debris and significantly raised the potential for serious fires on the western slopes of Kaua'i (Hawai'i DLNR-Department of Forestry and Wildlife 1993). On O'ahu, fire is a potential threat to *D. montgomeryi*, *D. aglaia*, and *D. obatai* in the Wai'anae Mountains. The effects of fires on native Hawaiian vegetation are largely deleterious, tipping the competitive balance toward alien species. Unlike native plant species, many alien plant species recover quickly and increase in cover following fires (Cudihy and Stone 1990). Hawaiian picture-wing habitat that is damaged or destroyed by fire is likely to be invaded and revegetated by alien plants that cannot be used as host plants by picture-wings.

Two Hawaiian picture wings, *Drosophila obatai* and *D. aglaia*, occur on Federal property at Pu'u Pane, a part of the United States Army's Schofield Barracks Military Reservation. The gently sloping lands below Pu'u Pane are used as a live firing range, and ordnance-induced fires are a common occurrence. Although firebreak roads have been constructed around the perimeter of the firing range, uncontrollable fire still remains a threat to these species and their habitat.

#### *B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes*

Overutilization is not a threat to any of the proposed Hawaiian picture-wings. While these and other species are valuable and popular as scientific research subjects, only a small number of researchers actively engage in field collections of these taxa. The individuals involved in this activity are professional biologists, knowledgeable and cognizant of the biology and conservation status of these animals. Because of the special collecting techniques involved, the use of these flies by more people for any purpose is highly unlikely. In addition, the collection of small numbers of adult flies would have little impact on the viability of a population, and such collection is necessary for accurate identification and conservation research.

#### *C. Disease or Predation*

Over 2,500 alien arthropods are now established in Hawai'i (Howarth 1990, Howarth *et al.* 1995, Nishida 1994), with a continuing establishment rate of 10-20 new species per year (Beardsley 1962, 1979). Many of these alien species have severe effects on the native

Hawaiian insect fauna (Asquith 1995). Species of social Hymenoptera (ants and some wasps) and parasitic wasps pose the greatest threat to the Hawaiian picture-wings. Ants and other social insects frequently dominate the ecologies of tropical ecosystems and strongly influence the evolution of certain plants and animals. However, all of the native Hawaiian arthropods, including the Hawaiian picture-wings, evolved without the predation influence of ants or social wasps, and the subsequent arrival of these new groups to the Hawaiian islands has been devastating to the relatively defenseless native Hawaiian invertebrate flora.

Ants can be particularly destructive predators because of their high densities, recruitment behavior, aggressiveness, and broad range of diet (Reimer 1993). These attributes allow some ants to affect prey populations independent of prey density; thus ants can locate and destroy isolated populations and individuals (Nafus 1993). At least 36 species of ants are known to be established in the Hawaiian Islands, and particularly aggressive species have had severe effects on the native insect fauna (Zimmerman 1948). By the late 1870s, the big-headed ant (*Pheidole megacephala*) was present in Hawai'i, and its predation on native insects was noted by the early Hawaiian naturalist R.C.L. Perkins (1913), "It may be said that no native Hawaiian Coleoptera insect can resist this predator, and it is practically useless to attempt to collect where it is well established. Just on the limits of its range, one may occasionally meet with a few native beetles (e.g., species of *Plagithmysus*), often with these ants attached to their legs and bodies, but sooner or later they are quite exterminated from these localities." With few exceptions, native insects have been eliminated from areas where the big-headed ant is present (Perkins 1913, Gagne 1979, Gillespie and Reimer 1993), and it has been documented to completely exterminate populations of native insects.

The Argentine ant (*Iridomyrmex humilis*) was discovered on the island of O'ahu in 1940 and is now established on all the main islands. Unlike the big-headed ant, the Argentine ant is primarily confined to higher elevations (Reimer *et al.* 1990). This species has been demonstrated to reduce populations or even eliminate native arthropods at high elevations in Haleakala National Park on Mau'i (Cole *et al.* 1992). While this species does not disperse by flight, colonies are moved about with soil and construction material; a colony was recently

discovered on an isolated peak on the island of O'ahu under a radio tower.

The long-legged ant (*Anoplolepis longipes*) appeared in Hawai'i in 1952 and now occurs on O'ahu, Mau'i, and Hawai'i (Reimer *et al.* 1990). It inhabits low-elevation (less than 600 m (2,000 ft)), rocky areas of moderate rainfall (less than 250 cm (100 in.) annually) (Reimer *et al.* 1990). Direct observations indicate that Hawaiian arthropods are susceptible to predation by this species (Gillespie and Reimer 1993), and Hardy (1979) documented the disappearance of most native insects from Kipahulu Stream on Mau'i after the area was invaded by the long-legged ant.

At least two species of fire ants, *Solenopsis geminita* and *S. papuana*, are also important threats (Reagan 1986; Gillespie and Reimer 1993) and occur on all the major islands (Reimer *et al.* 1990). *Solenopsis geminita* is known to be a significant predator on pest fruit flies (Diptera: Tephritidae) in Hawai'i (Wong and Wong 1988). *Solenopsis papuana* is the only abundant, aggressive ant that has invaded intact mesic forest above 600 m (2,000 ft) and is still expanding its range in Hawai'i (Reimer 1993).

Numerous other ant species are recognized as threats to native invertebrates, and additional species become established almost yearly. While the larvae of most of the Hawaiian picture-wings feed deep in the substrate of the host plant, they emerge and move away to pupate in the ground, thus exposing themselves to predation by ants. Upon newly emerging as adults, these flies are particularly susceptible to predation. Adult picture-wings have been observed with ants attached to their legs (Kaneshiro and Kaneshiro 1995).

Another group of social insects that are voracious predators and were originally absent from Hawai'i are yellowjacket wasps (Hymenoptera: Vespidae). In 1977, an aggressive race of the western yellowjacket (*Paravespula pennsylvanica*) became established in Hawai'i and is now abundant at most higher elevations (Gambino *et al.* 1990). In Haleakala National Park on Mau'i, yellowjackets were found to forage predominantly on native arthropods (Gambino *et al.* 1987, 1990, Gambino and Loope 1992). Overwintering yellowjacket colonies in Hawai'i can produce over half a million foragers that consume tens of millions of arthropods, and evidence exists for localized reduction in native arthropod abundance (Gambino and Loope 1992). Yellowjackets have been observed preying on Hawaiian picture-wings (Kaneshiro and Kaneshiro 1995), and



the establishment of this species on the island of Hawai'i corresponded with a significant decline in several species of Hawaiian picture-wings (Carson 1982b, 1986, Foote and Carson 1995). Yellowjackets pose a serious threat to all Hawaiian picture-wing species in this proposed rulemaking.

Hawai'i also has a limited number of native parasitic Hymenoptera (wasps), with only species of Eucoliidae recorded to utilize Hawaiian picture-wings as hosts. Several species of alien braconid wasps, *Diaschasmimorpha tryoni*, *D. longicaudatus*, *Opius vandenboschi*, and *Biosteres arisanus*, were purposefully introduced into Hawai'i to control several species of pest tephritid fruit flies (Funasaki *et al.* 1988). However, none of these parasitic wasps are specific to the pest flies, but are known to attack other species of flies, including native Hawaiian Tephritidae. While these wasps have not been recorded parasitizing Hawaiian picture-wings, and may not successfully develop in Drosophilidae, females will sting any fly larva available and can cause significant mortality (T. Duan, University of Hawai'i, pers. comm., 1995). Large extensive releases of these wasps or introductions of new species pose potential threats to Hawaiian picture-wings.

#### D. The Inadequacy of Existing Regulatory Mechanisms

Currently, no Federal, State, or local laws, treaties, and/or regulations specifically apply to the 12 proposed species of Hawaiian picture-wings. Some of the species may indirectly receive some protection under Federal and State laws because they utilize host plants that are protected under the Federal Endangered Species Act and the State of Hawai'i's Endangered Species Act. This indirect protection, however, is not sufficient since the species of Hawaiian picture-wings that utilize protected host plants may not be physically present on the host plants at all times and because some threats to these Hawaiian picture-wings can occur regardless of their presence on a protected host plant.

As stated above, alien parasitic wasps pose a threat to the Hawaiian picture-wings. Some alien wasp species have been introduced by Federal and State agencies for biological control of pest flies. The U.S. Environmental Protection Agency (EPA), under the authority of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), regulates biological control agents as pesticides. However, EPA only regulates microorganisms (*i.e.*, bacteria, fungi, protozoa, and viruses). EPA has

exempted all other organisms from requirements of FIFRA, because it has determined that they are regulated by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS). The State of Hawai'i requires that new introductions be reviewed by special committees before release (HRS Chapt. 150A), and current USDA-APHIS policy is to submit permit application materials, including an environmental assessment or environmental impact statement, to the Service's Pacific Islands Office for review under section 7 of the Act and National Environmental Policy Act (NEPA). However, predicting from laboratory studies the impacts introduced species may have on an ecosystem is difficult (Kauffman and Nechols 1992) and the purposeful release or augmentation of any Dipteran predator or parasitoid is a potential threat to these 12 species of Hawaiian picture-wing flies.

Federal listing would automatically invoke listing under Hawai'i State law, which prohibits taking and encourages conservation by State government agencies. Hawai'i's Endangered Species Act (HRS, Sect. 195D-4(a)) states, "Any species of aquatic life, wildlife, or land plant that has been determined to be an endangered species pursuant to the (Federal) Endangered Species Act shall be deemed to be an endangered species under the provisions of this chapter and any indigenous species of aquatic life, wildlife, or land plant that has been determined to be a threatened species pursuant to the (Federal) Endangered Species Act shall be deemed to be a threatened species under the provisions of this chapter." State regulations prohibit the removal, destruction, or damage of federally listed animals found on State lands (HRS, Sect. 195D-4(e)). Further, the State may enter into agreements with Federal agencies to administer and manage any area required for the conservation, management, enhancement, or protection of endangered species (HRS, Sect. 195D-5(c)). Funds for these activities could be made available under section 6 (Cooperation with the States) of the Act. Federal listing of these species will, therefore, trigger the protection available under State law.

#### E. Other Natural or Manmade Factors Affecting Its Continued Existence

The small number of populations of *Drosophila neoclavisetae*, *D. mulli*, and *D. heteroneura* puts these species at risk of extinction from naturally occurring, yet relatively common, events such as hurricanes and landslides. A hurricane could cause total population loss by

causing direct mortality, habitat destruction or modification, and the spread of invasive alien plants. The continued existence of these picture-wings is further complicated by their limited habitat. *Drosophila mulli* is only found at one location on the island of Hawai'i within a localized patch of *Pritchardia beccariana*. Adults are found only on the undersides of this plant, and further associations between *D. mulli* and this host plant are likely. *Drosophila neoclavisetae* is restricted to a ridgetop on the island of Mau'i where it has been found only within a small patch of endemic *Cyanea* spp. *Drosophila heteroneura* was believed to be extinct until it was rediscovered on private acreage at Hualalai Volcano in 1993. This remaining population is extremely small, with a 90 percent reduction from historical abundance (Kaneshiro and Kaneshiro 1995). Naturally occurring random events such as hurricanes or landslides may destroy vital *P. beccariana* or *Cyanea* spp., thus placing *D. mulli* and *D. neoclavisetae* at significant risk of extinction by eliminating the only habitat in which they have been found. Additionally, the destruction of native plants opens a niche for the establishment of introduced alien plant species. Once alien species are established, it is difficult for native plants, including host plants for *Drosophila* spp., to recover and thrive successfully.

The Service has carefully assessed the best scientific and commercial information available regarding the past, present, and future threats faced by the 12 species in determining to propose this rule. Based on this evaluation, the proposed action is to list *Drosophila aglaia*, *D. differens*, *D. hemipeza*, *D. heteroneura*, *D. montgomeryi*, *D. mulli*, *D. musaphilia*, *D. neoclavisetae*, *D. obatai*, *D. ochrobasis*, *D. substenoptera*, and *D. tarphytrichia*, as endangered. All 12 species are endangered by one or more of the following: habitat degradation by pigs, goats, deer, cattle, and alien plants; habitat loss from fire; predation by ants and alien wasps; and biological pest control. Three species are known from less than three populations, making them susceptible to extinction from naturally occurring random events. Because these 12 species are in danger of extinction throughout all or a significant portion of their ranges, they fit the definition of endangered as defined in the Act. Therefore, the Service proposes to list these species as endangered.

#### Critical Habitat

In the last few years, a series of court decisions has overturned our

determinations regarding a variety of species that designation of critical habitat would not be prudent (e.g., *Natural Resources Defense Council v. U.S. Department of the Interior* 113 F. 3d 1121 (9th Cir. 1997); *Conservation Council for Hawaii v. Babbitt*, 2 F. Supp. 2d 1280 (D. Hawaii 1998)). Based on the standards applied in those judicial opinions, we have examined the question of whether critical habitat for the 12 species of *Drosophila* flies would be prudent.

Although the 12 species have small population sizes, they do not appear to be vulnerable to unrestricted collection, vandalism, or other intentional disturbance at this time. We remain concerned that these threats might be exacerbated by the publication of critical habitat maps and further dissemination of locational information. However, we have examined the evidence available and have not found specific evidence of taking, vandalism, collection, or trade of this species or any similarly situated species. Consequently, consistent with applicable regulations (50 CFR 424.12(a)(1)(i)) and recent case law, we do not expect that the identification of critical habitat will increase the degree of threat to this species of taking or other human activity.

In the absence of a finding that critical habitat would increase threats to a species, if any benefits would result from critical habitat designation, then a prudent finding is warranted. In the case of these species, some benefits may result from designation of critical habitat. The primary regulatory effect of critical habitat is the section 7 requirement that Federal agencies refrain from taking any action that destroys or adversely modifies critical habitat. While a critical habitat designation for habitat currently occupied by these species would not be likely to change the section 7 consultation outcome, because an action that destroys or adversely modifies such critical habitat would also be likely to result in jeopardy to the species, in some instances section 7 consultation might be triggered only if critical habitat is designated. Examples include unoccupied habitat or occupied habitat that may become unoccupied in the future. Designating critical habitat may also provide some educational or informational benefits. Therefore, we propose that critical habitat is prudent for *Drosophila aglaia*, *D. differens*, *D. hemipeza*, *D. heteroneura*, *D. montgomeryi*, *D. mulli*, *D. musaphilia*, *D. neoclavisetae*, *D. obatai*, *D. ochrobasis*, *D. substenoptera*, and *D. tarphytrichia*.

Critical habitat is not determinable when one or both of the following situations exist: the information needed to analyze the impacts of the designation is lacking, or the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat (50 CFR 424.12). Currently, we have found that critical habitat for the 12 *Drosophila* flies is not determinable based on our inadequate knowledge about the relationship of the flies to their primary and secondary host plant(s), the distributions of these host plant(s), the bacteria and fungal communities necessary for successful *Drosophila* larval development, and the relationship of these flies to other native and nonnative flies.

As discussed in the Background section of this proposed rule, each of the twelve species of *Drosophila* proposed for listing is restricted geographically to a single island; six species are reported from Oahu, three species are reported from the island of Hawaii, and one species, each, is reported from Kauai, Molokai, and Maui. All twelve species appear to have highly specialized breeding sites; they use small sections of fermenting or rotting areas on their host plant(s). The host plants are also, in many cases, "single-island endemics". Some, in fact, have already been independently listed as endangered or threatened and their locations are available through various government and privately-sponsored databases and from individual botanists. Unfortunately, information on the specific locations of other host plants may not be known, making determination of critical habitat difficult. In addition, we do not currently understand the relationship between the primary and the secondary host plant(s) and their associated *Drosophila* species. Factors that determine host suitability may include host plant size, the size and age of a rotting area upon which the larvae feed, the position of the rotting area with respect to the surrounding vegetation, soil moisture, relative humidity, frequency of rainfall and fog drip, and the presence or absence of other detritus (decaying organic matter) feeders, such as slugs and earthworms. However, it is not clear from currently available information which, or if all, of these factor(s) are essential for the long-term conservation of each *Drosophila* species.

We are also unable to determine critical habitat for these flies based on the lack of information on the bacteria and fungal communities necessary for successful *Drosophila* larval development. The larvae of all twelve

*Drosophila* species are microbivores (fungus feeders) and little is known about their bacteria and fungal requirements or about the ability of host plant species to support them. This information is needed to determine what primary constituent elements are needed for fly larvae to survive.

Finally, we are currently unable to determine the inter-specific relationships between these species and other, more common species of *Drosophila*, introduced tipulids (crane flies), and other non-native fly species. Preliminary research strongly suggests that inter-generic competition is potentially an important limiting factor for the picture-wing *Drosophila* and may inhibit or limit their use of certain host plants. Additional information on these interrelationships will assist in determining what impacts these relationships have on the habitat requirements of these 12 flies.

When we find that critical habitat is not determinable, our regulations (50 CFR 424.17) provide that, within one year of the date of the final rule listing the species, we must publish a final rule designating critical habitat, based on the best information available at the time. Due to a limited listing budget, we plan to employ a priority system for deciding which outstanding critical habitat designations should be addressed first. We will focus our efforts on those designations that will provide the most conservation benefit, taking into consideration the efficacy of critical habitat designation in addressing the threats to the species, and the magnitude and immediacy of those threats. Therefore, if these species are listed, we will develop a proposal to designate critical habitat for the 12 species of *Drosophila* flies as soon as feasible, considering our workload priorities, as outlined in our priority system, and available funding.

#### Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Endangered Species Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing encourages public awareness and results in conservation actions by Federal, State, and private agencies, groups, and individuals. The Act provides for possible land acquisition and cooperation with the State and requires that recovery actions be carried out for all listed species. Funding may be available through section 6 of the Act for the State to conduct recovery activities. The

protection required of Federal agencies and the prohibitions against certain activities involving listed animals are discussed, in part, below.

Listing the 12 *Drosophila* species provides for the development and implementation of recovery plans for these species. These plans will bring together Federal, State, and regional agency efforts for the conservation of the species. Recovery plans will establish a framework for agencies to coordinate their recovery efforts. The plans will set recovery priorities and estimate the costs of the tasks necessary to accomplish the priorities. They will also describe the site-specific management actions necessary to achieve conservation and survival of these species.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer informally with us on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) requires Federal agencies to insure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into formal consultation with us.

Federal agency actions that may require conference and/or consultation as described in the preceding paragraph include, but are not limited to: Army Corps of Engineers involvement in projects, such as the construction of roads, bridges, and dredging projects, subject to section 404 of the Clean Water Act (33 U.S.C. 1344 *et seq.*) and section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401 *et seq.*); U.S. Environmental Protection Agency authorized discharges under the National Pollutant Discharge Elimination System (NPDES); U.S. Department of Agriculture involved in release or permitting release of biological control agents under the Plant Pest Act; military training and activity carried out by the U.S. Department of Defense; and projects by the Natural Resources Conservation Service and U.S. Department of Housing and Urban Development.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions of section 9(a)(2) of the Act, implemented by 50 CFR 17.21 for endangered species, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), import or export, ship in interstate or foreign commerce in the course of a commercial activity, or sell or offer for sale in interstate or foreign commerce any endangered wildlife species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to agents of the Service and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 and 17.23. Such permits are available for scientific purposes, to enhance the propagation or survival of the species, and/or for incidental take in the course of otherwise lawful activities. Requests for copies of the regulations regarding listed wildlife and inquiries about permits and prohibitions may be addressed to the U.S. Fish and Wildlife Service, Endangered Species Permits, 911 Northeast 11th Avenue, Portland, Oregon 97232-4181 (telephone 503/231-6241; facsimile 503/231-6243).

As published in the **Federal Register** on July 1, 1994, (59 FR 34272), our policy is to identify, to the maximum extent practicable at the time a species is listed, those activities that would or would not be likely to constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of the listing on proposed and ongoing activities within a species' range. Likely activities that we believe could potentially result in a violation of section 9 of the Act include, but are not limited to, the following: road and firebreak construction; military troop movements; loss of habitat due to fire resulting from the use of military ammunition; intentional release or augmentation of biological control agents; introduction of other alien species; and collection of individuals for any purpose without a permit. Activities that we believe would not likely result in a violation of section 9 of the Act include, but are not limited to, non-destructive activities in areas occupied by these species, such as hiking, collecting non-host plants for cultural usage (e.g., hula halau), and

hunting. Activities that occur under a valid incidental take permit or in accordance with a section 7 consultation would not violate section 9.

Questions regarding whether specific activities will constitute a violation of section 9 of the Act should be directed to the Manager of the Pacific Islands Ecoregion (see **ADDRESSES** section).

If these Hawaiian picture-wing flies are listed under the Act, the State of Hawai'i Endangered Species Act (HRS, Sect. 195D-4(a)) is automatically invoked, prohibiting taking and encouraging conservation by State government agencies. Further, the State may enter into agreements with Federal agencies to administer and manage any area required for the conservation, management, enhancement, or protection of endangered species (HRS, Sect. 195D-5(c)). Funds for these activities could be made available under section 6 of the Act (State Cooperative Agreements). Thus, the Federal protection afforded to these species by listing them as endangered species will be reinforced and supplemented by protection under State law.

#### Public Comments Solicited

We intend that any final action resulting from this proposal will be as accurate and as effective as possible. Therefore, comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule are hereby solicited. Comments particularly are sought concerning:

- (1) Biological, commercial, or other relevant data concerning any threat (or lack thereof) to these species;
- (2) The location of any additional populations of these species;
- (3) Identification of habitat that should be designated as critical habitat and the reasons why this habitat should be determined to be critical habitat pursuant to section 4 of the Act or any reasons why critical habitat should not be designated;
- (4) Additional information concerning the range, distribution, and population size of these species; and
- (5) Current or planned activities in the subject area and their possible impacts on these species.

Final issuance of regulations on these species will take into consideration the comments and any additional information received by the Service, and such communications may lead to a final regulation that differs from this proposal. In accordance with interagency policy published on July 1,

1994 (59 FR 34270), upon publication of this proposed rule in the **Federal Register** we will solicit expert reviews by at least three specialists regarding pertinent scientific or commercial data and assumptions relating to the taxonomic, biological, and ecological information for the three species. The purpose of such a review is to ensure that listing decisions are based on scientifically sound data, assumptions, and analyses, including the input of appropriate experts. We will summarize the opinions of these reviewers in the final decision document. The final determination may differ from this proposal based upon the information we receive.

You may request a public hearing on this proposal. Your request for a hearing must be made in writing and filed within 45 days of the date of publication of this proposal in the **Federal Register**. Address your requests to the Field Supervisor (see **ADDRESSES** section).

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the rulemaking record, which we will honor to the extent allowable by law. In some circumstances, we would withhold from the rulemaking record a respondent's identity, as allowable by law. If you wish for us to withhold your name and/or address, you must state this request prominently at the beginning of your comment. However,

we will not consider anonymous comments. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

**Electronic Access and Filing**

You may send comments by e-mail to [pwflies\\_pr@fws.gov](mailto:pwflies_pr@fws.gov). Please submit these comments as an ASCII file and avoid the use of special characters and any form of encryption. Please also include "Attn: 1018-AG23" and your name and return address in your e-mail message. If you do not receive a confirmation from the system that we have received your e-mail message, contact us directly by calling our Pacific Islands Office at phone number 808-541-3441.

**National Environmental Policy Act**

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244).

**References Cited**

A complete list of all references and data cited herein, as well as others, is

available upon request from Pacific Islands Ecoregion (see **ADDRESSES** section).

**Author**

The primary author of this document is Dr. Adam Asquith, U.S. Fish and Wildlife Service, Pacific Islands Ecoregion (see **ADDRESSES** section).

**List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and Transportation.

**Proposed Regulation Promulgation**

Accordingly, the Service hereby proposes to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

**PART 17—[AMENDED]**

1. The authority citation for Part 17 continues to read as follows:

**Authority:** 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500, unless otherwise noted.

2. Section 17.11(h) is amended by adding the following, in alphabetical order under the family indicated, to the List of Endangered and Threatened Wildlife to read as follows:

**§ 17.11 Endangered and threatened wildlife.**

\* \* \* \* \*  
(h) \* \* \*

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat
Common name	Scientific name					
INSECTS						
*	*	*	*	*	*	*
Fly, Hawaiian picture-wing	<i>Drosophila aglaia</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila differens</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila hemipeza</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila heteroneura</i> ...	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila montgomeryi</i> ..	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila mulli</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila musaphilia</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila neoclavisetae</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila obatai</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila ochrobasis</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA
Fly, Hawaiian picture-wing	<i>Drosophila substenoptera</i> .....	U.S.A. (HI) .....	NA .....	E	NA	NA

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat
Common name	Scientific name					
Fly, Hawaiian picture-wing	<i>Drosophila tarphytrichia</i> ...	U.S.A. (HI) .....	NA .....	E	NA	NA
*	*	*	*	*	*	*

Dated: December 15, 2000.  
**Jamie Rappaport Clark,**  
*Director, Fish and Wildlife Service.*  
 [FR Doc. 01-1338 Filed 1-16-01; 8:45 am]  
**BILLING CODE 4310-55-U**

**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**50 CFR Part 679**

[I.D. 010301D]

RIN 0648-AL95

**Fisheries of the Exclusive Economic Zone Off Alaska; Amendments to Alaska Groundfish and Crab Fishery Management Plans to Revise the License Limitation Program**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Notice of availability of amendments to fishery management plans; request for comments.

**SUMMARY:** The North Pacific Fishery Management Council (Council) has submitted Amendment 60 to the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area, Amendment 58 to the Fishery Management Plan for Groundfish of the Gulf of Alaska and Amendment 10 to the Fishery Management Plan for the Commercial King and Tanner Crab Fisheries in the Bering Sea and the Aleutian Islands (FMPs). These plan amendments are necessary to implement changes to the License Limitation Program (LLP) as recommended by the Council and are intended to further the objectives of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the FMPs.  
**DATES:** Comments on Amendments 60, 58, and 10 must be submitted by March 19, 2001.

**ADDRESSES:** Comments on the proposed plan amendments should be submitted to Sue Salvesson, Assistant Regional Administrator for Sustainable Fisheries, Alaska Region, NMFS, P.O. Box 21668, Juneau, Alaska, 99802, Attn: Lori

Gravel, or delivered to the Federal Building, 709 West 9th Street, Juneau, AK. Comments may also be sent by facsimile (fax) to 907-586-7465. Comments will not be accepted if submitted via e-mail or Internet. Copies of Amendments 60, 58, and 10 and the Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis prepared for the proposed plan amendments are available from the North Pacific Fishery Management Council, 605 West 4th Ave., Suite 306, Anchorage, AK 99501-2252; telephone 907-271-2809.  
**FOR FURTHER INFORMATION CONTACT:** Jim Hale, 907-586-7228.

**SUPPLEMENTARY INFORMATION:**

**Background**

The Magnuson-Stevens Act requires that each Regional Fishery Management Council submit any fishery management plan or plan amendment it prepares to NMFS for review and approval, disapproval, or partial approval. The Magnuson-Stevens Act also requires that NMFS, after receiving a fishery management plan or plan amendment, immediately publish a notice in the **Federal Register** that the fishery management plan or plan amendment is available for public review and comment. This action constitutes such notice for Amendments 60, 58, and 10 to the FMPs. NMFS will consider public comments received during the comment period in determining whether to approve these proposed plan amendments. To be considered, a comment must be received by the close of business on the last day of the comment period.

In June 1995, the Council recommended that NMFS implement the LLP to address concerns of excess capital in the groundfish and crab fisheries off Alaska. The LLP is the second stage of a multi-staged process to reduce capacity in the affected fisheries. The LLP will replace the Vessel Moratorium Program (VMP), a program implemented by NMFS on January 1, 1996, to impose a temporary moratorium on the entry of new capacity in the groundfish and crab fisheries off Alaska and to define the class of entities that would be eligible for licenses under the LLP. The VMP expired on December 31, 1999 (64 FR

3651). The final rule implementing the LLP specifies that fishing will begin under the LLP on January 1, 2000 (63 FR 52642, October 1, 1998).

If approved, Amendments 60, 58, and 10 would make several changes to the final rule implementing the LLP. First, the Council recommended that recent participation criteria be added to the eligibility requirements for a crab species license. Originally, a person applying for a crab species license had to demonstrate that documented harvests were made from a qualifying vessel during two periods, the general qualification period (GQP) and the endorsement qualification period (EQP). If approved, Amendment 10 would add a third period, the recent participation period (RPP), in which a person would have to demonstrate that documented harvests of crab were made from a qualifying vessel. The RPP was added to the eligibility requirements for a crab species license because of the Council's concern that a crab species license could be issued to a person whose eligibility was based on participation that has been inactive since 1995. These "latent licenses" could be transferred to persons who would become active in the fishery. Such transfers would be contrary to the purpose of the LLP because it would create the potential to increase fishing effort above the current levels in the crab fisheries. Except under specific exemptions provided in the FMP amendments, the RPP would require that a person demonstrate that at least one documented harvest of any crab species was made during the period beginning January 1, 1996, through February 7, 1998.

The Council's second recommendation is to require that the vessel designated on the LLP license be transferred with the LLP license, if that LLP license was issued based on documented harvests made from a vessel without a Federal Fisheries Permit. A Federal Fisheries Permit is required for any vessel that participates in a Federal groundfish fishery off Alaska. If a vessel did not participate in Federal groundfish fisheries off Alaska, its qualifying documented harvests must have occurred in waters of the State of