

remaining individuals (HINHP Database 2001; Service 1998b; 61 FR 53089).

*Diellia falcata* (NCN)

*Diellia falcata*, in the polypody family (Polypodiaceae) and a short-lived perennial fern, grows from a rhizome (underground stem) 1 to 5 cm (0.4 to 2 in) long and 0.5 to 2 cm (0.2 to 0.8 in) in diameter. The rhizome is covered with small black or maroon scales. This species is distinguished from others in the genus by the color and texture of its leaf stalk, the venation pattern of its fronds, the color of its scales, its rounded and reduced lower pinnae (leaflets), and its separate sori (spore clusters) arranged on marginal projections (Service 1998b; Wagner 1952).

*Diellia falcata* hybridizes with *Diellia unisora*. It has been observed with fronds bearing sori (spores) year-round. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Diellia falcata* was known from almost the entire length of the Waianae Mountains, from Manini Gulch to Palehua Iki, as well as from the Koolau Mountains of Oahu, from Kaipapau Valley to Aiea Gulch. This species remains in Waieli Gulch, Ekahanui Gulch, Makaleha Valley, Makaha Valley, Palikea Gulch, Makua Valley, Kaimuhole Gulch, Kuaokala-Manini Gulch, Pahole Gulch, Puu Ku Makalii, Kapuna Gulch, Mohiakea Gulch, Waianae Kai, Pualii Gulch, Napepeiauolelo Gulch, Kahanahaiki Valley, Nanakuli-Lualualei Ridge, Makua, Kamaileunu Ridge, Kaluaa Gulch, and Huliwai Gulch on Federal, State, city, county, and private lands. The 30 known occurrences contain fewer than 6,000 individuals (EDA Database 2001; GDSI 2001; HINHP Database 2001).

*Diellia falcata* is a terrestrial fern that typically grows in deep shade or open understory on moderate to moderately steep slopes and gulch bottoms in diverse mesic forest between 224 and 953 m (735 and 3,126 ft) elevation. Associated native species include *Acacia koa*, *Alyxia oliviformis*, *Antidesma* sp., *Asplenium kaulfussii* (kuau), *Carex meyenii* (NCN), *Charpentiera* sp., *Claoxylon sandwicense*, *Coprosma foliosa*, *Diospyros hillebrandii*, *Diplazium sandwichianum*, *Doodia kunthiana* (okupukupu), *Dryopteris unidentata*, *Elaeocarpus bifidus*, *Freycinetia arborea*, *Hedyotis terminalis*, *Hibiscus* sp., *Melicope* sp., *Metrosideros polymorpha*, *Myrsine lanaiensis*,

*Nephrolepis exaltata* (kupukupu), *Nestegis sandwicensis*, *Nothocestrum* sp., *Pipturus* sp., *Pisonia sandwicensis*, *Pouteria sandwicensis*, *Psychotria* sp., *Psydrax odorata*, *Sapindus oahuensis*, *Selaginella arbuscula*, *Sophora chrysophylla* (mamane), or *Xylosma* sp. (HINHP Database 2001).

The major threats to *Diellia falcata* are habitat degradation by feral goats and pigs; competition from the nonnative plant species *Aleurites moluccana*, *Ageratina riparia*, *Blechnum appendiculatum*, *Christella parasitica*, *Clidemia hirta*, *Grevillea robusta*, *Heliocarpus popayanensis*, *Kalanchoe pinnata*, *Lantana camara*, *Melinis minutiflora*, *Paspalum conjugatum*, *Passiflora ligularis* (sweet granadilla), *Passiflora suberosa*, *Pimenta dioica*, *Psidium cattleianum*, *Psidium guajava*, *Rubus argutus*, *Schefflera actinophylla* (octopus tree), *Schinus terebinthifolius*, *Syzygium cumini*, and *Toona ciliata*; and fire (HINHP Database 2001; Service 1998b; 56 FR 55770).

*Diellia unisora* (NCN)

*Diellia unisora*, a short-lived perennial in the polypody fern family (Polypodiaceae), grows from a slender, erect rhizome to reach 0.5 to 3 cm (0.2 to 1.2 in) in height and 0.5 to 1 cm (0.2 to 0.4 in) in diameter. The rhizome is covered with the bases of the leaf stalks and a few small black scales. This species is distinguished from others in the genus by a rhizome completely covered by the persisting bases of the leaf stalks and few, very small scales; by sori mostly confined to the upper pinnae margins; and by delicate fronds gradually and symmetrically narrowing toward the apex (Wagner 1952).

*Diellia unisora* hybridizes with *Diellia falcata*. Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Historically, *Diellia unisora* was known from steep, grassy, rocky slopes on the western side of the Waianae Mountains of Oahu. This species is known to be extant in the southern Waianae Mountains at South Ekahanui Gulch, Palawai Gulch, and the Pualii-Napepeiauolelo Ridge. The 4 known occurrences, which are on State and private lands, contain fewer than 800 individuals (GDSI 2001; HINHP Database 2001).

*Diellia unisora* is a terrestrial fern that typically grows on moderate to steep slopes or gulch bottoms in deep shade or open understory, mesic forest between 382 and 953 m (1,253 and 3,126 ft) elevation. Associated native species include *Acacia koa*, *Alyxia*

*oliviformis*, *Antidesma* sp., *Bidens torta*, *Carex meyenii*, *Chamaesyce multiflora*, *Coprosma* sp., *Dodonaea viscosa*, *Doryopteris unidentata*, *Eragrostis grandis* (lovegrass), *Hedyotis schlechtendahlana* (kopa), *Hedyotis terminalis*, *Metrosideros polymorpha*, *Myrsine lessertiana*, *Rumex* sp., *Psychotria* sp., or *Selaginella arbuscula* (HINHP Database 2001; 59 FR 32932).

The major threats to *Diellia unisora* are habitat degradation by feral pigs and competition from the nonnative plant species *Ageratina riparia*, *Blechnum appendiculatum*, *Clidemia hirta*, *Melinis minutiflora*, *Passiflora suberosa*, *Psidium cattleianum*, *Schefflera actinophylla*, and *Schinus terebinthifolius* (HINHP Database 2001; 59 FR 32932).

*Dubautia herbstobatae* (Naenae)

*Dubautia herbstobatae*, a member of the aster family (Asteraceae) and a short-lived perennial, is a small, spreading shrub to 50 cm (20 in) tall. *Dubautia herbstobatae* is distinguished from other species on Oahu in this endemic genus by the outer bracts of the flower heads being fused, forming a cup surrounding the florets, and by one large vein showing in each leaf (Carr 1999).

*Dubautia herbstobatae* is likely outcrossing and possibly self-incompatible (i.e., pollen from the same plant will not produce seed). Flowering usually occurs in May and June. Pollination is almost certainly achieved by insect activity, and fruit dispersal is probably quite localized (Service 1998b). Little else is known about its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors.

*Dubautia herbstobatae* is known to be extant in 12 occurrences in the northern Waianae Mountains, on Ohikilolo and Kamaileunu Ridges, Keaau, and Waianae Kai on State lands and land under Federal jurisdiction. Fewer than 100 individuals are known from these locations (EDA Database 2001; GDSI 2001; HINHP Database 2001).

*Dubautia herbstobatae* typically grows on rock outcrops, ridges, moderate slopes, or vertical cliffs in dry or mesic shrubland at elevations between 266 and 978 m (872 and 3,208 ft). Associated native species include *Artemisia australis*, *Bidens torta*, *Carex meyenii*, *Chamaesyce celastroides* (akoko), *Dodonaea viscosa*, *Eragrostis variabilis* (kawelu), *Metrosideros polymorpha*, and *Schiedea mannii* (NCN) (HINHP Database 2001; 56 FR 55770; EDA, *in litt.* 2001).

The major threats to *Dubautia herbstobatae* are habitat degradation by