ELEMENT STEWARDSHIP ABSTRACT

for

Fraxinus uhdei

Tropical Ash

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The Nature Conservancy
Element Stewardship Abstract
For Fraxinus uhdei

I. IDENTIFIERS
Common Name: Global Rank: G?

General Description:
Tree of the olive family (Oleacea) reaching up to 25 m tall.

Pest/Weed Considerations:
Found on major islands; pest on Oahu and Molokai (Smith 1985). considered a pest on Oahu and Molokai (Smith 1985). considered a pest on Oahu and Molokai (Smith 1985).

II. STEWARDSHIP SUMMARY
Fraxinus uhdei is a habitat-disruptive alien plant species in Hawaii, at least on Molokai and Oahu. Its success as a weed is due to prolific seedling recruitment, rapid early growth, and the shade tolerance of seedlings and saplings. Manual and mechanical methods can be used for smaller plants, although their efficiency is problematic. Ring notching or cut stump with Garlon 3A is recommended for larger plants. Control efforts should begin with outlying plants and the edges of larger stands and progress toward the center of the stands. Monitoring the recovery of highly altered stands following control efforts is warranted. Control efforts should begin immediately at Kamakou Preserve, but can be prioritized below other species at Waikamoi Preserve. Detailed studies of life-history and ecology are not needed, although seed viability in the soil is of interest to management.

III. NATURAL HISTORY
Range:
Native to western and southern Mexico, it was introduced to Hawaii originally as a shade tree.

Habitat:
Fraxinus uhdei was planted extensively starting in the 1920's as a watershed species, and in the 1960's as a potential timber species. Over 700,000 trees were planted, all apparently from the same seed source, two trees on Oahu planted in the 1890's (Little and Skolmen 1989).

Fraxinus uhdei appears to have a rather broad range of tolerance. It has been planted and escaped from plantings in wet and mesic environments. It grows best between 1,000 and 1,700 m elevation but also up to 2,000 m (Smith 1985). Nelson and Schubert (1976) report that it grows best from 450-1500 m in moist, well-drained sites. In mesic and dry areas, it is usually confined to gulches and wet areas (Skolmen, pers. comm., 1991).
Reproduction:

Fraxinus uhdei regenerates mostly or possibly exclusively from seed (Skolmen, pers. comm., 1991). Seed production is copious. Although fruits are apparently adapted for wind-dispersal, establishments appear to be rather short range, suggesting that wind dispersal infrequent. Seeds banks may survive up to eight years, as suggested by continued seedling recruitment in populations controlled at Hawaii Volcanoes National Park. Its success as an invading species is probably due to copious seed production, ability to regenerate under its own canopy, shade tolerance of young plants, and rapid growth of seedlings, saplings, and poles.

Impacts:

Smith (1985) considers Fraxinus uhdei to be one of the 86 alien plant species most disruptive to native ecosystems in Hawaii because it can form single species stands. It appears to be more of a threat at Kamakou Preserve than Waikamoi. Its dispersal at Kamakou is enhanced by strategic location of the numerous plantings. Ash can be spread down stream and down slope from plantings. Tropical ash is slowly expanding uphill at Waikamoi. Recruitment from the seed bank appears to be considerably less than that in Kamakou.

IV. CONDITION

V. MANAGEMENT/MONITORING

Preserve Selection & Design Considerations:

The recovery of sites from which Fraxinus uhdei has been removed has not been determined to date. Recommended control programs at Kamakou will test recovery potential.

Management Requirements:

Control of Fraxinus uhdei should be a high priority at Kamakou Preserve. Tropical ash has altered fairly extensive areas, especially species-rich drainages. Small plantings and natural outliers are numerous, suggesting that tropical ash may spread rapidly in the future. Control efforts are not urgent at Waikamoi Preserve where stands are smaller, less altered, and opportunities for dispersal reduced.

Only seedlings and small saplings can be uprooted manually. A weed wrench may be effective on larger saplings, but relatively time-consuming. Use of an herbicide is required for larger plants. Arakaki et al. (1989) found that undiluted Garlon 3A in a continuous ring notch application offered complete control. Use of Garlon 3A as a cut stump applications should be more practical for smaller trees. Lower concentrations than that recommended for notching may also be effective. Management should start with outlying populations and the edges of larger stands and work toward the center of the stand.

Management Programs:

Some control, especially of smaller plants, has been undertaken at Kamamkou. Four small populations were controlled at Hawaii Volcanoes National Park, although control efforts are still needed on seedlings.
Monitoring Requirements:

Monitoring is needed at Kamakou Preserve to determine the complete distribution of Fraxinus uhdei in the preserve, management effectiveness once control efforts begin, and recovery of stands in which it is controlled.

Distribution mapping and quantitative assessments of cover and density in treated stands.

Monitoring Programs:

Houck (1987) used relevés to characterize vegetation in Fraxinus uhdei stands. Their utility for monitoring depends on the ability of future investigators to relocate these unmarked study sites.

VI. RESEARCH

Management Research Programs:

Houck (1987) attempted to document the impact of Fraxinus uhdei on native vegetation by characterizing tropical ash dominated stands in Kamakou Preserve. Arakaki et al. 1989 found an effective herbicide to control tropical ash. No other published literature could be located on conservation management aspects of this species. Most of the limited research literature deals with experimental forestry planting of tropical ash in Hawaii.

Management Research Needs:

Houck's report (Houch 1987) is useful in elucidating its interaction with native vegetation and indicating the magnitude of the threat posed by Fraxinus uhdei to Kamakou Preserve. (Unfortunately, few studies of this kind have been conducted for disruptive alien plant species in Hawaii.) The monitoring described above should be sufficient for management purposes.

In general, thorough studies of life-history and ecology are warranted for widely spread disruptive species such as strawberry guava (Psidium cattleianum) and clidemia (Clidemia hirta). However, testing viability of tropical ash seed under field conditions will help managers in developing control programs. This can be done by burying seed in soil in containers below the level at which light stimulated germination will take place. A sample can be extracted every 6-12 months, and seeds can be tested for germination under greenhouse or laboratory conditions.

VII. ADDITIONAL TOPICS

VIII. INFORMATION SOURCES

Bibliography:


IX. DOCUMENT PREPARATION & MAINTENANCE

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