Scope of work for Hawaii Sandalwood Seed Orchard Project - FY23

In Hawai'i, both the native sandalwood (*Santalum spp.*) and koa (*Acacia koa*) trees are highly valued economically, ecologically, and culturally. Owing to the multiple threats of fire, predation, and habitat loss, the regeneration of sandalwood and koa is a significant concern. One significant threat to Hawaiian koa forests is koa wilt disease, caused by *Fusarium oxysporum* f.sp. *koae*, which can prevent the successful establishment of commercial plantations and restoration projects. This project will support establishing and maintaining a network of ecoregional specific sandalwood and disease resistant koa seed orchards by island to produce improved sandalwood and koa seeds in coordination with various partners.

DOFAW seeks a vendor to carry out this statewide project detailed below, working in close collaboration with DOFAW district staff. Vendor will also advise DOFAW staff on technical issues relating to koa and sandalwood and needs to demonstrate sufficient technical expertise.

Project activities are divided into 2 main parts:

<u>Part 1: Sandalwood Seed Orchard – Establishment and Maintenance</u>

Maui:

- Establish a 2-5 acre sandalwood seed orchard site on the island of Maui. This orchard will eventually provide seed for native forestry restoration efforts within the local ecoregion. Collected seeds for propagation from mother trees within the local eco-region will be selected for vigor, form, and potential high oil quality for planting into the orchard.
- Seed orchard establishment, including site preparation (e.g., weed control, clearing, disking, ripping) and planting, will be coordinated with DOFAW and the private landowner. The design and layout for the planting will be conducted by the vendor. The planting of seedlings will be carried out jointly by vendor, DOFAW, and private landowner as appropriate. Status: ongoing
- Note: Ulupalakua Ranch has been tentatively selected as the site. If needed, the vendor will coordinate with DOFAW on alternative sites.

VENDOR REQUIREMENTS: The vendor will need to possess sandalwood seedling stock originating from selected eco-region on the island of Maui. Nursery capacity to grow seedlings for outplanting and previous experience establishing sandalwood plantations is also required.

Oahu:

• Conduct quarterly maintenance* of the 5 acre Helemano Koa/Sandalwood seed orchard.

Hawaii Island:

• Conduct quarterly maintenance* of two existing sandalwood seed orchards in South Kona on Hawaii Island (Haloa Aina and Kealakekua Mountain Reserve).

VENDOR REQUIREMENTS: Experience maintaining sandalwood plantings is required including silvicultural treatments such as site preparation, thinning, pruning, herbicide applications, insect and disease management techniques, and forest measurements.

<u>Part 2: Koa Disease Resistance – Seed Collection & Disease Resistance Screening,</u> <u>Outplanting, and Seed Orchard Maintenance*</u>

Hawaii Island:

- Collect seed from koa mother trees (20-30) in Ka'u and Kona and screen for disease resistance.
- Begin planning discussion with DOFAW and neighboring land managers for locating another seed orchard at Kapapala.

Maui:

- Continue discussions with the Division's Maui office on siting and developing a plan for a medium to large-scale planting at Kamehamenui for 2023, including the production of seedlings and site preparation.
- Maintain the disease resistant koa seed orchard at Kula Forest Reserve.

Oahu:

- Conduct quarterly maintenance of the 5 acre Helemano Koa/Sandalwood seed orchard (see above). Maintenance for this site will include the mowing and herbicide treatment of weeds.
- Continue planning larger-scale plantings with disease resistant koa at Helemano with the Division's Oahu office.

Kauai:

- Harvest and process seed from existing orchard and collect from additional wild mother trees (insert #) to screen for resistance, increasing genetic diversity if existing seed.
- Continue discussions with the Division and private partners for nursery capacity to grow out seedlings for large-scale plantings.
- Conduct maintenance on existing seed orchard at Koke'e.

Provide technical assistance to DOFAW staff related to silvicultural and nursery practices for growing both koa and sandalwood.

VENDOR REQUIREMENTS: Vendor should possess 5-10 years of forestry experience working with koa and sandalwood. The vendor needs to possess pathogenic isolates of F. oxysporum in order to conduct the disease screening trials for newly collected koa seed accessions. The vendor is also required to compile data related to this scope of work (e.g., tree growth data, location of mother trees, etc.) and share with DOFAW.

*Seed orchard maintenance consists of weed suppression, pruning, pest monitoring, and growth measurements unless otherwise specified.

Vendors shall submit a short proposal along with a quote, listing qualifications and other requirements mentioned above.