**State of California The Resources Agency**

**Memorandum**

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| **To:**         | Board of Forestry   | **Date:** June 29, 2021**Telephone:** (530) 379-5085**Website:** www.fire.ca.gov |

**From**: Stewart McMorrow, Staff Chief Wildfire Resilience

Lewis A. Moran Reforestation Center

Resource Management

**California Department of Forestry and Fire Protection (CAL FIRE)**

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| **Subject:**  | Establishment of Seedling Prices for sale to the public |

**Nursery Background**

CAL FIRE operated a forest nursery at the L. A. Moran Reforestation Center in Davis, CA, from 1921-2003, at which point nursery operations were shuttered due to budget constraints. In 2018, CAL FIRE staff began the process of re-opening the nursery, producing a small crop of 21,380 containerized seedlings in 2019 and a crop of 82,000 seedlings in 2020. In 2021, nursery staff are on track to produce 185,000 seedlings.

***Nursery facilities***

Presently, the nursery has two 3,000 square-foot greenhouses and one 8,500 square-foot shade house, with imminent plans to construct two additional 3,000 square-foot shade houses, allowing for a maximum annual production of 240,000 containerized seedlings under ideal conditions. The nursery has also secured the materials to construct an additional 9,800 square-foot greenhouse, pending 2022 Capital Outlay Budget Change Proposal which would grant approval for construction. If successful, the new greenhouse would bring total maximum production capacity up to 520,000 by the 2023 growing season. At this stage, there are no plans to resume bare-root production.

***Nursery customers***

Since re-opening in 2018, the nursery has provided seedlings to a mix of foundations, trusts, mid-size landowners, and non-industrial, small scale private landowners, as well as to State Demonstration Forests. The priority focus on is non-industrial private landowners, as reflected in the 2020 median order size of 200 trees. Despite most orders being small orders, most trees did go to larger projects in 2020, as detailed in Figure 1.

| Customer Type | Number of Orders | Number of Seedlings |
| --- | --- | --- |
| Tree Planting Trusts and Non-Profits | 5 | 59,282 |
| Large Private Land Projects (> 1,000 seedlings) | 5 | 21,314 |
| Small Private Land Projects (<1,000 seedlings) | 20 | 2,640 |

Figure 1. 2020 Seedling production by customer type

Seedlings are grown for projects throughout the state, as reflected by the diversity of species and seed sources used in 2020 (Figures 2 and 3).

| Coast Redwood / *Sequoia sempervirens* | 450 |
| --- | --- |
| Douglas Fir / *Pseudotsuga menziesii* | 15,342 |
| Giant Sequoia / *Sequoiadendron giganteum* | 550 |
| Gray Pine / *Pinus sabiana* | 3,435 |
| Incense Cedar / *Calocedrus decurrens* | 5,170 |
| Ponderosa Pine / *Pinus ponderosa* | 27,294 |
| Sugar Pine / *Pinus lambertiana* | 27,513 |
| Jeffrey Pine / *Pinus jefferyi* | 4,060 |

Figure 2. 2020 Seedling production by species

| Seed Zone | Region | Counties Encompassed | Quantity |
| --- | --- | --- | --- |
| 94 | Mendocino Coast | Mendocino | 3,550 |
| 97 | Central Coast/ South Bay | San Mateo and Santa Cruz | 450 |
| 372 | Inland North Coast Range | Lake, Colusa and Glenn | 3,600 |
| 380 | Napa | Napa and Lake | 3,150 |
| 523 | Northeastern Sierra Nevada | Plumas | 2,630 |
| 524 | Northwestern Sierra Nevada | Butte and Plumas | 20,681 |
| 525 | Northern Sierra Nevada | Yuba, Nevada, Sierra, Placer | 7,921 |
| 531 | Central Sierra Nevada | Tuolumne, Calaveras | 7,524 |
| 533 | Southern Sierra Nevada | Fresno | 4,800 |
| 534 | Southern Sierra Nevada | Tulare | 7,174 |
| 994 | Eastern Transverse Range | San Bernardino | 20,621 |

Figure 3. 2020 Seedling production by seed zone.

**Proposed Pricing Structure**

***Comparable facilities***

Other state- and federally-run nurseries in the western U.S. sell seedlings to the public for between $0.44 and $1.16/seedling. The least expensive seedlings are grown by the U.S. Forest Service Placerville nursery at a cost of $0.58/seedling. Although these seedlings cannot be sold directly to private landowners, they are sometimes sold to tree-planting foundations nearly at cost ($0.585 if picked up or $0.685 if shipped). Additionally, USFS partners with the El Dorado County Resource Conservation District to sell their seedlings to the general public for $0.44/seedling.

Other government-run nurseries have slightly higher prices: the Webster Forest Nursery run by the Washington State Department of Natural Resources sells seedlings for between $0.60 and $1.25, depending on quantity and species. The Montana Conservation Seedling Nursery sells seedlings for $1.16/seedling while a nursery run by the University of Idaho sells for $1.00.

Many private nurseries that primarily have a retail focus but occasionally produce contract-grown seedlings for reforestation do not have fixed prices and set cost on a case-by-case basis depending on seedling quantity, species, and container size. Based on discussions with small nurseries as well as nursery customers, it seems most agreements end up costing between $0.60 and $1.10 on a per seedling basis.

***Projected 2021 production costs for L. A. Moran Reforestation Center***

Target net production: 185,200 seedlings

Target gross production: 240,500 seedlings

| Material | Quantity Required | Cost Per Unit | Total Cost |
| --- | --- | --- | --- |
| Sytro-91 growing blocks | 2670 styroblocks | $2.52 | $6731 |
| Growing Media | 45 cubic yards | $137 | $6165 |
| Seed | 24lbs | $207 | $4968 |
| Fertilizers | 60 25-lb bags | $30 | $1800 |
| Water | 7,000 CCF | $4.88 | $34,160 |
| Power | $2800 for gas and electric |
| Pesticides | 20 applications | $50 | $1000 |
| Shipping Supplies | 730 boxes | $9 | $6570 |
|  ***Total Materials Cost:*** | ***$64,194*** |
| Staff Type | Pay Rate | Time Worked | Percent Time | Total Cost |
| Senior Environmental Scientist | $6,816/mo | 12 months | 30% | $24,537 |
| Environmental Scientist | $4,680/mo | 12 months | 40% | $22,464 |
| Forestry Aide | $3,020/mo | 9 months | 50% | $13,590 |
| Inmate Crew | $285/day | 24 days | 100% | $6840 |
|  ***Estimated Labor Cost:*** | ***$67,431*** |
|  Actual Cost Per Seedling: | $0.72/seedling |

***Extrapolating based on past LAMRC prices***

Because the nursery is still not at full production levels and some costs are difficult to disaggregate from the rest of LAMRC’s operating costs, it is difficult to accurately assess the nursery’s current production costs. However, when the nursery was fully operational prior to being shut down, seedling costs were tied to production costs. In 2003, LAMRC sold seedlings for $0.42/seedling, or $0.61/seedling in today’s dollars.

***Proposed pricing structure***

Considering past LAMRC pricing as well as the prices set by other government run nurseries, and the infinite unknowns related to future sowing requests and challenges, we propose the following pricing structure for L.A. Moran Reforestation Center seedlings, to go into effect for the 2022 growing season:

Contract orders (1,000 seedling/species minimum): $0.50/seedling

Speculative orders, 1-499 seedlings: $0.60/seedling

Speculative orders, 500+ seedlings: $0.55/seedling