

seeds or cuttings due to the labor involved with growing them.

Cuttings are fragments of *Sedum* plants that have fallen off of a main plant. These cuttings can completely regrow into a full plant, given the right conditions. Cuttings will flower in the second year after planting.

Direct seeding living roofs is also possible, through hand spreading or hydro-seeding. Hydro-seeding involves the spraying of a mixture of seeds and fiber mulch or fertilizer. These methods will not provide rapid coverage, as seeds will take time to establish themselves.

Vegetated mats or trays are grown in an off-site nursery and delivered complete with soil media, and possibly a tray. A vegetated mat can be cut and placed directly on the roof or placed into a tray system. These off-site planting techniques have the advantage of immediate full or nearly full coverage upon installation. However, they may be more costly than on-site planting due to the additional labor involved. They can also be readily replaced, in whole or in part, whether to address mortality or otherwise modify the living roof for aesthetic purposes.

Recommended Plant List

PROVEN ON NUMEROUS ROOFTOPS IN SAN FRANCISCO



Achillea millefolium
Common yarrow



Arctostaphylos uva-ursi
California Bearberry



Armeria maritima
Sea thrift



Eschozia californica
California poppy



Epilobium canum
California fuchsia



Festuca californica
California fescue



Fragaria chiloensis
Beach strawberry



Juncus patens
Spreading rush



Lupinus bicolor
Miniature lupine



Mimulus aurantiacus
Sticky monkey flower



Muhlenbergia rigens
Deergrass



Nemophila menziesii
Baby blue-eyes



Prunella vulgaris
Self-heal



Sisyrinchium bellum
Blue-eyed grass



Sedum acre
Goldmoss stonecrop



Sedum album
White stonecrop



Sedum kamtschaticum
Yellow Stonecrop



Sedum oregonum
Oregon stonecrop



Sedum spathulifolium
Cape blanco stonecrop



Sedum spurium
Dragon's blood sedum

Interview with Kendra Hauser
California Academy of Sciences

How does your living roof provide habitat?

The California Academy of Sciences' living roof is 2.5 acres and composed of over 90 species of California native plants. We take an active role in selecting local native plants, introduce plant species that are important nectar, pollen, and seed sources for wildlife, and develop our plantings to incorporate plant species that will bloom at varying times of the year to maximize food sources. Emphasis is not only placed on providing food sources for local species, but also ensuring that wildlife has shelter for nesting and hiding from predators. To achieve this we select plants of varying heights, grass species, and incorporate rocks and branches on the roof. To encourage California native bees to nest on the roof, we created earth mounds and a bee house composed of logs.

What types of species regularly visit the living roof?

We have had a variety of birds visit the roof, including the Lesser goldfinch, black phoebe, dark-eyed junco, and Anna's hummingbird. Two reoccurring bird visitors are the killdeer and red-tailed hawk. Red-tailed hawks have been nesting in a Monterey Cypress on our grounds for many years. Within two years of the roof being installed, the hawks began using the roof as a space for their fledglings to practice flight. Nearly every day in the summer we will see the hawks sunning on the domes or feeding on the roof! A variety of bees, butterflies, and moths also visit the roof. We are always excited and surprised to see new ground dwelling animals as inhabitants in our growing media and currently have spiders, beetles, grasshoppers, pill bugs, and earth worms on the roof!

Welcoming Native Species

SPECIES



Hummingbirds
Anna's hummingbird



Bees
California bumble bee



Butterflies
Green hairstreak

RECOMMENDED FOOD AND HABITAT PLANTS



California fuchsia



Miniature lupine



Deerweed



Hummingbird sage



Coast buckwheat



Sea thrift



California Bearberry



Yarrow



Seaside daisy

OTHER HABITAT ELEMENTS



Tree branches for resting



Earth mounds for burrowing



Pond for water source

See page 45 for photo credits.