A PROPOSAL TO COLLECT BRYOPHYTES (MOSSES, LIVERWORTS, AND HORNWORTS) FROM THE JASPER RIDGE BIOLOGICAL PRESERVE

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WHAT ARE BRYOPHYTES ANYWAY?

Bryophytes are the first lands plants that include three distinct lineages: mosses, liverworts, and hornworts. They differ primarily from the flowering plants by lacking roots, flowers, seeds, and a defined system of tissues for transporting fluids throughout the plant. Bryophytes reproduce not by seeds, but rather, single-celled spores. Many bryophytes can also form new plants by vegetative means.

Since bryophytes have no roots, they are not restricted to grow on soil. Many bryophytes are quite content to grow on rock surfaces and tree trunks. In addition, rock/soil chemistry can influence which species become established across an elevation gradient throughout California. Mosses and liverworts occur in all plant communities in California from the arid desert slopes of Death Valley to coastal bluffs along the Pacific Ocean.

While the inventory of bryophytes in California is still ongoing, there are currently 615 mosses, 150 liverworts, and 7 hornworts documented for California. The mosses in California are especially diverse with nearly 50 percent of all of the mosses reported for North America also found within California. New distribution records are frequently reported and even species new to science continue to be discovered in the State. The coastal counties are particularly rich in bryophytes due to the summer maritime influence.

WHY SURVEY AT JASPER RIDGE BIOLOGICAL PRESERVE?

Few bryophyte records currently exist from Santa Clara County based on a review of voucher specimens housed at the California Academy of Sciences and the University Herbarium, Berkeley. The bryophyte collections that once were housed at the Dudley Herbarium, Stanford were transferred to the University of British Columbia, Canada.

There are nearly 325 bryophytes currently reported for the central coast eco-region as described in the Jepson Manual of Higher Plants of California and probably fewer than 75 bryophyte species are likely to occur within the Jasper Ridge Biological Preserve. However, without a modern-day survey this number is mere speculation. Because bryophytes are relatively small plants, they can be more difficult to recognize to the species level in the field compared to most vascular plants. This is especially true of the tiny ephemeral soil taxa that are usually only observed during the winter period, and therefore, ephemeral bryophytes generally cannot be named to a high level of certainty without the aid of a microscope. Therefore, voucher samples are necessary to provide for accurate identifications. There are, however, some common and large species that can be readily recognized to the species level in the field with only a hand-lens.

This proposal is to make selected samples of bryophytes within each of the habitat types occurring in the JRBP. Since bryophytes lack roots, many species will occupy boulders and rock walls or be restricted to trunks of trees. Other species will occur on soil and litter. Generally the amount of plant material that would fit in the palm of your hand is all that is required to make adequate bryophyte herbarium specimen. Several docents of JRBP have asked me to show them the common bryophytes and they would also like to assist in the survey. At the completion of the survey, a checklist will be prepared along with the habitat types utilized for each species. I anticipate that the entire JRBP could be sampled in a couple of days. The best time to conduct an inventory in this portion of the State is during the winter-early spring months. Of particular interest will be the bryophytes occurring on the Ecocene sandstone outcrops and the serpentine grasslands.

HOW ARE BRYOPHYTES COLLECTED?

Bryophytes are simply collected and then placed in small folded paper packets from heavy stock photocopy paper (28# stock works well). No plant press is required. In fact, bryophytes should never be pressed flat since many species have diagnostic traits (twisting of leaves and stems) as they dry. These diagnostic features commonly used in dichotomous keys would be 'lost' if the bryophyte were pressed flat like in a traditional plant press. Collected specimens are simply air dried. A draft label is attached to the packet until the specimen can be named to species. Most bryophytes (mosses and leafy liverworts) are 1-cell thick across the leaf surface. The size, shape, and types of cells across the leaf surface contribute to the diagnostic features used in identification keys. Once identified, a final label is prepared. Specimens are then transferred into a 100 percent cotton fiber paper packet. Once the label is attached to the archival packet then the specimen can be filed into the herbarium and be readily available to the scientific community. A synoptic set (one high quality packet to represent each species in the JRBP) can be made available to the as a reference collection.