Letter of Inquiry for: **"Redwood and Sequoia Inventory for Puget Sound Region"**
November 9, 2016 to UW Center for Creative Conservation
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PROJECT OVERVIEW: Trans-disciplinary discussions would aim to foster broad organizational involvement in **launching student and/or citizen-science projects** to conduct **baseline data-gathering** and management histories of existing specimens in the Puget Sound region of two species of conifer trees currently native to California: Coast Redwood (*Sequoia sempervirons*) and Giant Sequoia (*Sequoiadendron giganteum*).

CREATIVE CONSERVATION: The baseline information would be gathered in anticipation of **future policy discussions as to whether, when, and where these two iconic species should be assisted in "migrating" to the Pacific Northwest** (a) for their own wellbeing as potential "climate refugees" and (b) to ensure viable and species-rich conifer forests in this region despite altered climate regimes that will force our own native species/populations to move poleward and upslope.

TRANS-DISCIPLINARY ASPECTS:

• **Landscape architecture and horticulture**: Because landscapers and horticulturalists have traditionally experimented with plantings of non-native species, and because the low-elevation locales of Puget Sound, apparently, have been hospitable to redwoods and sequoias for a century or more, these two professions (along with their amateur enthusiasts) unknowingly established an extraordinary number of "assisted migration" experiments that are now ripe for inventory and analysis.

• **Conservation biology:** Born in the 1970s when "the 6th major mass extinction" was recognized as underway, this discipline is now in the throes of having to adapt its understanding of "native" range to this unprecedented time of rapid climate change.

• **Ecological restoration:** This field, too, is having to rework traditional aims and valuations to function in a time of rapid, ongoing, and uncertain climate change.

• **Paleoecology:** Representation from this discipline will be essential, as an understanding of fossil evidence of *Sequoia* and *Sequoiadendron* antecedents far north of California (including in the Puget Sound region) reduces fear of "invasiveness," so long as translocations mimic previous climate-driven plant migrations.

• **Forestry:** Foresters in British Columbia already are replanting timber harvests using seeds drawn from considerably downslope or southward populations of the same species. Foresters in Alberta are replanting beetle-killed lodgepole pine stands with seeds produced by USA populations of Douglas Fir and/or Ponderosa Pine. US Forest Service geneticists (now retired) at the Moscow, Idaho research station developed climate-driven range projections for 76 species of trees native to western North America (accessible here). Note: They were unable to make range projections for redwood trees because the available climate models do not include estimates of fog occurrences (which are essential for redwood thrival).

**• Communications:** Collecting oral histories will be crucial for ascertaining the age and management interventions that have helped (or hindered) growth of redwood and sequoia specimens found in the Puget Sound region. The process of engaging landowners and neighbors in conversations can foster pride in their unusual trees and soften the divisive issue of climate change. As well, journalism skills could be put in play to yield submissions to local papers and magazines. Finally, video capture and editing skills (including knowledge of uploading video projects freely to youtube) will be crucial for (a) capturing baseline footage for comparison with future shifts in vegetation and (b) to facilitate remote

and future assessment of specimens and their surrounds beyond the skills of students and citizen volunteers.

• **Volunteerism and environmental activism:** The leader's experience with organizing a somewhat similar initiative in the eastern USA (Torreya Guardians) prompts her to remark that, because climate change is such a distressing topic, offering students and citizens an opportunity to engage immediately in outdoor, tangible action with other volunteers can fend off depression and dampen denial.

SPECIAL CONSIDERATIONS:

• **Projected losses of sea-level Douglas-fir:** USFS range projections for Douglas-fir in the Puget Sound region suggest substantial losses, especially at low elevations. Offering fire-resistant redwoods (and *Sequoiadendron* in the Olympic rainshadow) an opportunity to grow in the canopy gaps as Douglas-fir weaken, are beetle-killed, or destroyed by fire could ensure a viable, fast-growing and tall canopy by the end of this century, despite the losses of intervening decades.

• **Seek out instances of confirmed "naturalization":** The project leader has thus far documented two instances in which redwood plantings for landscaping purposes (Kitsap Peninsula and Whidbey Island) have not only been successful but have launched seeds into nearby untended forests such that the seedlings have established with no human assistance. Thus it will be crucial for students and volunteers conducting inventories to scrutinize nearby areas for evidence of species "naturalization" (and for graduate students or professionals to do thorough analyses of sample areas that have the greatest naturalization success, especially of a diverse age structure).

PROJECT LEADER: While Connie Barlow, founder of Torreya Guardians (and retired science writer), is submitting this proposal, she would be happy for CCC staff to suggest/locate an alternate team leader. Barlow's full cv is online (including her four books, plus academic papers and popular writings). The two sections relevant to this proposal are: Writings in Evolutionary Biology and Ecological Advocacy.

PROPOSED TEAM MEMBERS: Barlow contacted Franja Bryant of the Washington Native Plant Society, who then forwarded Barlow's short proposal (with links) to the society's Conservation Committee. She has not yet heard a response. Given the importance of landscape/horticulture to this project, perhaps Ken Yocom could evaluate this proposal, with an eye to suggesting a UW lead in his field. Also, Joshua Lawler is a national leader already on the issue of "assisted migration." Barlow is being unofficially mentored by the former senior US Forest Service geneticist (Gerald Rehfeldt) who co-produced the range shift projections for 76 tree species; Rehfeldt could suggest a USFS professional to be on the team. Barlow also had a series of e-conversations with UW emeritus paleobotanist Estella Leopold, concerning Leopold's team findings of Torreya fossils in Washington state.

BACKGROUND ONLINE READING:

• Annotated list of scholarly links on the "assisted migration" controversy; key subsections:

    • Urban Ecology Assisted Migration and article in Landscape Architecture magazine

    • papers and articles on Sequoia & Redwood assisted migration

    • key assisted migration review articles in forestry journals

    • Ethics, Law, and History papers on the assisted migration debate

    • correspondence bt. Barlow and Estella Leopold (incl. paleoecology specifics)

    • Barlow's 2004 paper (with Paul S. Martin) that launched the assisted migration debate