

2 November 2016

I am hereby reviewing “Threatened Species Status for *Chorizanthe parryi* var. *fernandina* (San Fernando Valley Spineflower)” FWS-R8-ES-2016-0078-0001. Federal Register 81 (179): 63454-63466. I also had access to the much more detailed Species Report FWS-R8-ES-2016-0078-0004.

This proposed listing is clearly written, logical, and displays considerable understanding of the biology of such plants. I concur that this variety of Spineflower is threatened and should be listed as such. The variety *fernandina* differs from the variety *parryi* in having straight rather than hooked spines and having a distribution more to the west rather than around the Inland Empire.

After many opportunities to find other populations, the San Fernando Valley Spineflower (SFVS) is reduced from a much larger geographic range to two occurrences—Laskey Mesa in the Simi Hills, and Newhall Land Company holdings in Santa Clarita. The Laskey Mesa area is likely to remain in a large stretch of open space, and reportedly the Newhall Land Company has made a deal to set aside 76% (but not all) of the Santa Clarita area currently known to have SFVS. This occurrence will then become a series of small fragments within what will be a residential development.

From what I can tell, the species ecology of the SFVS is not well studied. It is a spring annual adapted to California’s unusual seasonality of wet mild winters and dry hot summers. Historically and by reference to variety *parryi*, these plants live on more or less bare ground, sometimes in loose mineral soil (“sand”) such as in washes and sometimes in more compacted soil. The surviving populations are in more compacted mineral soil. Competition by alien grassland species is a prime suspect for the decline of the SFVS based on the ecology of similar plants, although specific experimental work with the SFVS is not apparent. Quite plausibly, the alien competitors cannot grow to great density in the soils where the SFVS remains. It is hard to be confident in speculating about the ways in which the SFVS might be affected by disturbance of various sorts at various levels. Probably frequent fires would harm it by encouraging the aliens, but a few fires per century might be fine. It is not known what effect trampling the soil, or the plants themselves, might have.

The documents relayed observations of ants and honeybees visiting flowers. I am skeptical that this tells the whole story of the SFVS’s reliance on pollinators. Experiments should be done to determine if SFVS can effectively self-pollinate, if they make seeds when pollinators are excluded, if seeds produced by selfing suffer inbreeding depression compared to seeds produced by out-crossing, and how much nectar or other rewards they offer to pollinators. Moreover, additional observations

should be made at the flowers. I would suspect that either the SFVS is a habitual selfer, or else it once relied on native bees and flies for pollination. No comment was made about the desirability to maintain habitat for native bees and flower-visiting flies, although in general this comes easily in nature preserves.

Even greater ignorance revolves around the likelihood that the SFVS has features that promote a seed bank. The proposed listing only provides reference to relatives. It is predicted that the SFVS's seeds are not prompted to germinate by smoke or other features of fire. This needs to be studied more specifically, along with an inquiry into how long seeds last and what proportion germinate under various conditions. The answers to such questions will be needed if people are to help expand the SFVS to additional sites near the existing or historical sites. Knowledge of seed biology would also shed light on the meta-population dynamics that are likely. I would ask, can we reject the possibility that the SFVS shuttles from site to site over the decades being apparently absent from many sites in intervening years except as seeds? If so, the great expanse of alien grasslands and residential development may have cut off migration among potential sites.

The proposed listing repeatedly worries about Argentine Ants. This is a species that is associated with developed areas such as will be in close juxtaposition to the areas set aside by Newhall. The alien ants could disrupt the populations of helpful native ants (such as Harvester Ants). Other organisms associated with development and perhaps changes in water or fertilizer associated with development might be anticipated as well for the Newhall population fragments; that may depend on the landscaping that homeowners choose. This is perhaps too speculative to write into a proposed listing.

The proposed listing makes reference to research underway on the population genetic structure of SFVS (being done by Dr. D. Rodgers). This information will be helpful for management of the populations. However, to sum up my thoughts, it will not be sufficient. Quite a bit of research will be needed to put together a recovery plan that is anything more than setting aside the land of the two current populations.

Respectfully submitted,

A handwritten signature in cursive script that reads "Paul Wilson".

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