

RECOVERY PLANNING EXEMPTION FOR THE SOUTH LLANO SPRINGS MOSS (*DONRICHARDSIA MACRONEURON*)



Seven Hundred Springs. South Llano River, Edwards County, Texas (USFWS 2023, pg. 14).

The U.S. Fish and Wildlife Service (USFWS) listed the South Llano Springs Moss as endangered under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 et seq.) on April 27, 2023 (88 FR 25543). The listing was based on a Species Status Assessment (SSA) developed for the moss in 2021 and revised in 2023 (USFWS 2023, entire). The species was first collected in 1932 and described in 1933 (Grout 1933, pp. 1-2 and USFWS 2023, p. 5). DNA and morphological analysis confirmed the taxon is a unique species in the family Brachytheciaceae (Ignatov 2015, p. 435). The species is an obligate aquatic moss that grows on submerged or partially submerged rocks (USFWS 2023, p. 3).

South Llano Springs Moss has been documented at two sites in close proximity to each other along the South Llano River in Edwards and Kimble counties, Texas. The most recent documentation was during a 1979 survey at Seven Hundred Springs in Kimble County, immediately adjacent to the South Llano River. The site is privately owned, and no additional surveys have been permitted in the last 47 years. The other known site, referred to as the “Redfearn Site” is located approximately 5 kilometers (3.1 miles) downstream, and was surveyed

most recently in 2017, but the species was not observed (USFWS 2023, p. 7). We have concluded that the Redfearn population is extirpated.

Given that the species has been reduced to a single site that was last documented in 1979, there is significant uncertainty as to whether the species still exists (USFWS 2023, p. ii). When last observed in the wild in 1979, South Llano Springs Moss was abundant within an area of about 10 by 100 meters (33 by 328 feet) at Seven Hundred Springs (Wyatt and Stoneburner 1980, p. 516). Thus, the population size was or is small and vulnerable to stochastic demographic variation (USFWS 2023, p. 39). Any population limited to such a finite area is inherently vulnerable to stochastic environmental variation and to catastrophic events, such as flash floods or sedimentation.

Moss species closely related to South Llano Springs Moss reproduce both sexually and asexually; however, botanical specimens reared from the single locality produced only male reproductive parts. This indicates that sexual reproduction may not be possible for the species; therefore, if extant, it is possible that the single population is comprised of clones of the same individual (USFWS 2023, p. ii). The species may have a genetic population size of one individual spread across multiple moss mats (USFWS 2023, p. iii).

Given the precarious existence of South Llano Springs Moss and lack of survey access, it is impossible to fully elucidate the species' historical range, species-specific life-history requirements, habitat needs, and population viability levels required to sustain the species in the wild. Immediate and necessary steps for the recovery of this species are to: a) gain access to Seven Hundred Springs private land to determine if the species still exists; b) if not extinct, collect botanical specimens for research purposes, establish a captive population, and document available demographic data from the site; and, c) conduct additional surveys along the South Llano River to document any occurrence of the species at other sites. Until such information is available and access to Seven Hundred Springs is granted, we are unable to move forward with recovery efforts.

Section 4(f)(1) of the ESA requires the USFWS to develop and implement recovery plans for species listed as endangered or threatened, "unless [the Secretary] finds such a plan will not promote the conservation of the species." According to the 2010 Interim Endangered and Threatened Species Recovery Planning Guidance v1.3 jointly developed by the USFWS and the National Marine Fisheries Service (NMFS), acceptable justifications for an exemption from having a recovery plan include: (1) delisting is anticipated due to extinction or listing error; (2) the species' historical and current ranges occur entirely under the jurisdiction of other countries; and, (3) other circumstances not easily foreseen, but in which the species would not benefit from a recovery plan (USFWS and NMFS 2010, p. 28).

For the South Llano Springs Moss, we have determined that development of a recovery plan will not promote the conservation of the species as defined by the ESA, and that exemption from

recovery planning efforts are warranted under reason three (3) above. The “other circumstances” in this case are that the entire known extant range of the South Llano Springs Moss is privately owned and controlled by a single individual and this individual will not grant access to the property for species surveys. Until this relationship changes, it is not productive for the USFWS to unilaterally proceed with development of a recovery plan for which information on the current existence of the species, habitat, and threats are not available, and that would likely not be implemented.

This document is provided in lieu of a South Llano Springs Moss Recovery Plan.

Approve: _____

Acting Regional Director, US. Fish and Wildlife Service, Southwest Region

References

- Grout, A.J. 1933. *Hygroamblystegium macroneuron* N. Sp. The Bryologist 36:1–2.
- Ignatov, M.S. 2015. *Donrichardsia macroneuron* (Grout) H.A. Crum and L.E. Anderson. Flora of North America 28:435.
- U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). 2010. Interim Endangered and Threatened Species Recovery Planning Guidance. Version 1.3. 122 pp.
- U.S. Fish and Wildlife Service (USFWS). 2023. Species status assessment of *Donrichardsia macroneuron* (Grout) H. A. Crum & L. E. Anderson. U.S. Fish and Wildlife Service Southwest Region, Albuquerque, New Mexico. Version 1.1. 48 pp. + 3 appendices.
- Wyatt, R. and A. Stoneburner. 1980. Distribution and phenetic affinities of *Donrichardsia*., an endemic moss from the Edwards Plateau of Texas. The Bryologist 83:512–520.