

1 **A.31 AHART’S DWARF RUSH (*JUNCUS***
 2 ***LEIOSPERMUS* VAR. *AHARTII*)**

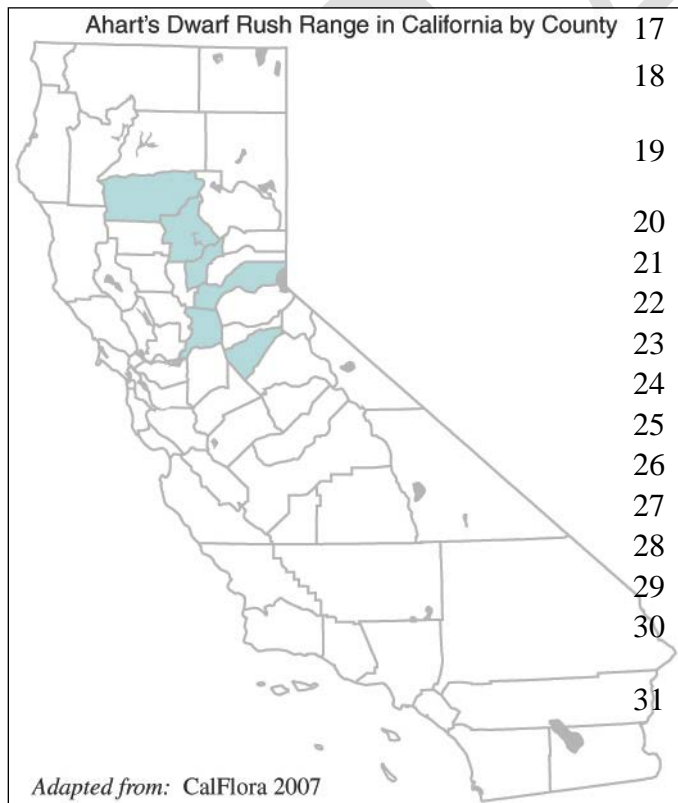
3 **A.31.1 Legal and Other Status**



photo courtesy BCAG

4 Ahart’s dwarf rush currently has no status under the federal
 5 Endangered Species Act (ESA), but is included in the
 6 *Recovery Plan for Vernal Pool Ecosystems of California and*
 7 *Southern Oregon* (USFWS 2005), hereafter “Recovery
 8 Plan.” The subspecies was a Category 1 candidate for listing
 9 under the federal ESA, but its status was withdrawn in 1996
 10 due to insufficient information to justify its listing as
 11 threatened or endangered (48 FR 53640, 61 FR 7457). The
 12 subspecies has no current status under the California ESA
 13 (DFG 2011).

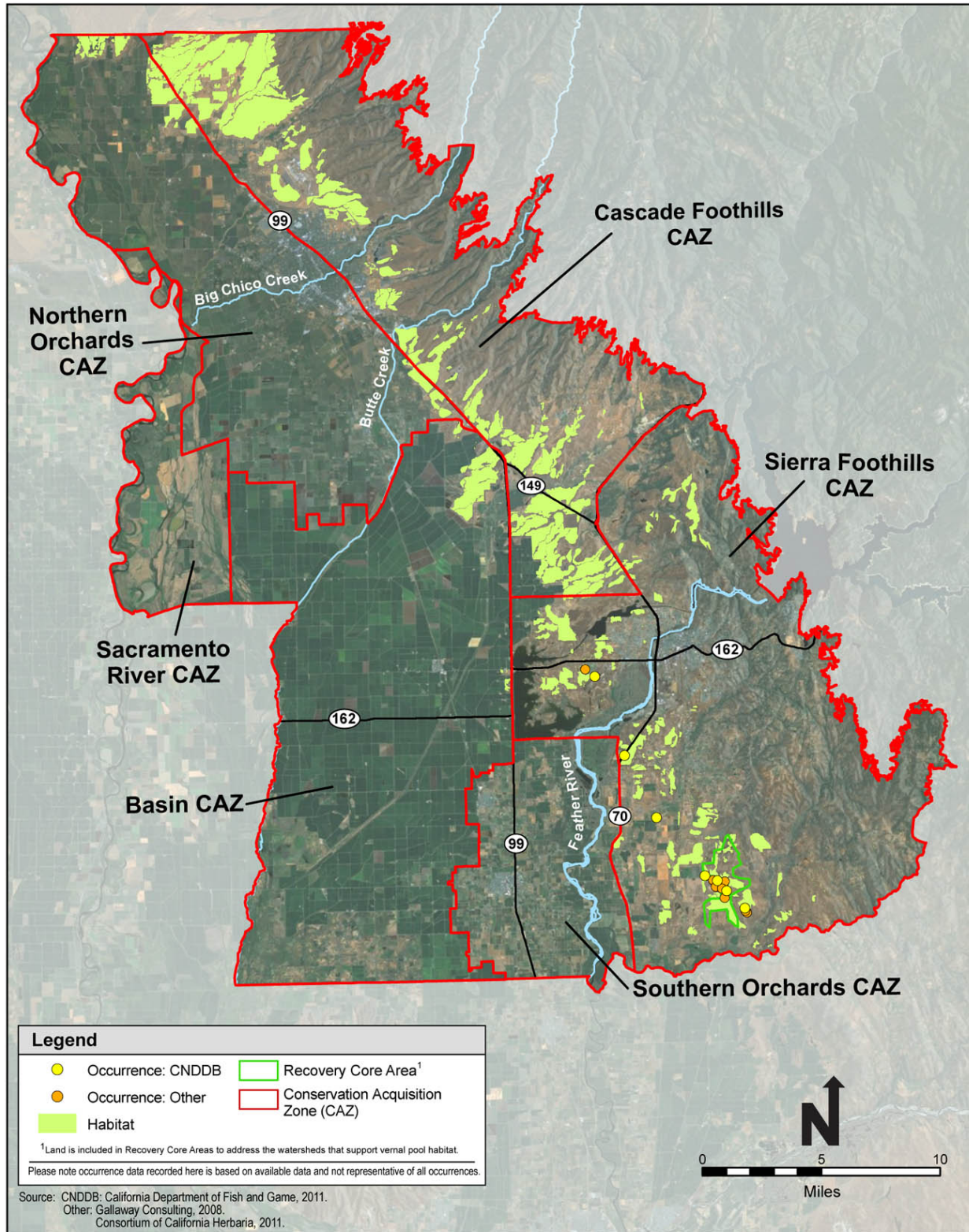
14 The California Native Plant Society (CNPS) includes Ahart’s
 15 dwarf rush on list 1B.2, rare, threatened, or endangered in California and elsewhere (CNPS
 16 2006).



17 **A.31.2 Species Distribution**
 18 **and Status**

19 **A.31.2.1 Range and Status**

20 Ahart’s dwarf rush has been documented
 21 at 10 locations in California: four in Butte
 22 County, two in Sacramento County, and
 23 one each in Calaveras, Yuba, Tehama and
 24 Placer Counties (CNDDDB 2007). One
 25 population in Sacramento County is
 26 believed to be extirpated due to
 27 development. All occurrences fall within
 28 the Northeastern Sacramento Valley or
 29 Southeastern Sacramento Valley Vernal
 30 Pool regions (see Figure A-31.1).



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Figure A-31.1 Ahart’s Dwarf Rush Modeled Habitat and Recorded Occurrences

1 **A.31.2.2 Distribution and Status in the Planning Area**

2 The California Natural Diversity Database (CNDDDB) includes four occurrences of Ahart’s dwarf
3 rush in Butte County (Figure A-31.1). All are listed as “presumed extant”; however, two have not
4 been visited for censusing since 1973 (CNDDDB Occurrences 5 and 6), when they were first
5 documented on Ahart Ranch (Honcut quadrangle) by the owner. One other occurrence on Ahart
6 Ranch (CNDDDB Occurrence 1), the type locality for the taxon, was last confirmed extant in 1991
7 (Figure A-31.2). In all, Ahart’s dwarf rush has been documented in about 10 separate vernal
8 pools at Ahart Ranch, which is located in the Northeastern Sacramento Valley Vernal Pool
9 Region. The fourth occurrence in Butte County (CNDDDB Occurrence 4) is located near the city
10 of Oroville (Palermo quadrangle), on both sides of the runway at the Oroville Municipal Airport,
11 on Redding Series soils (CNDDDB 2007).

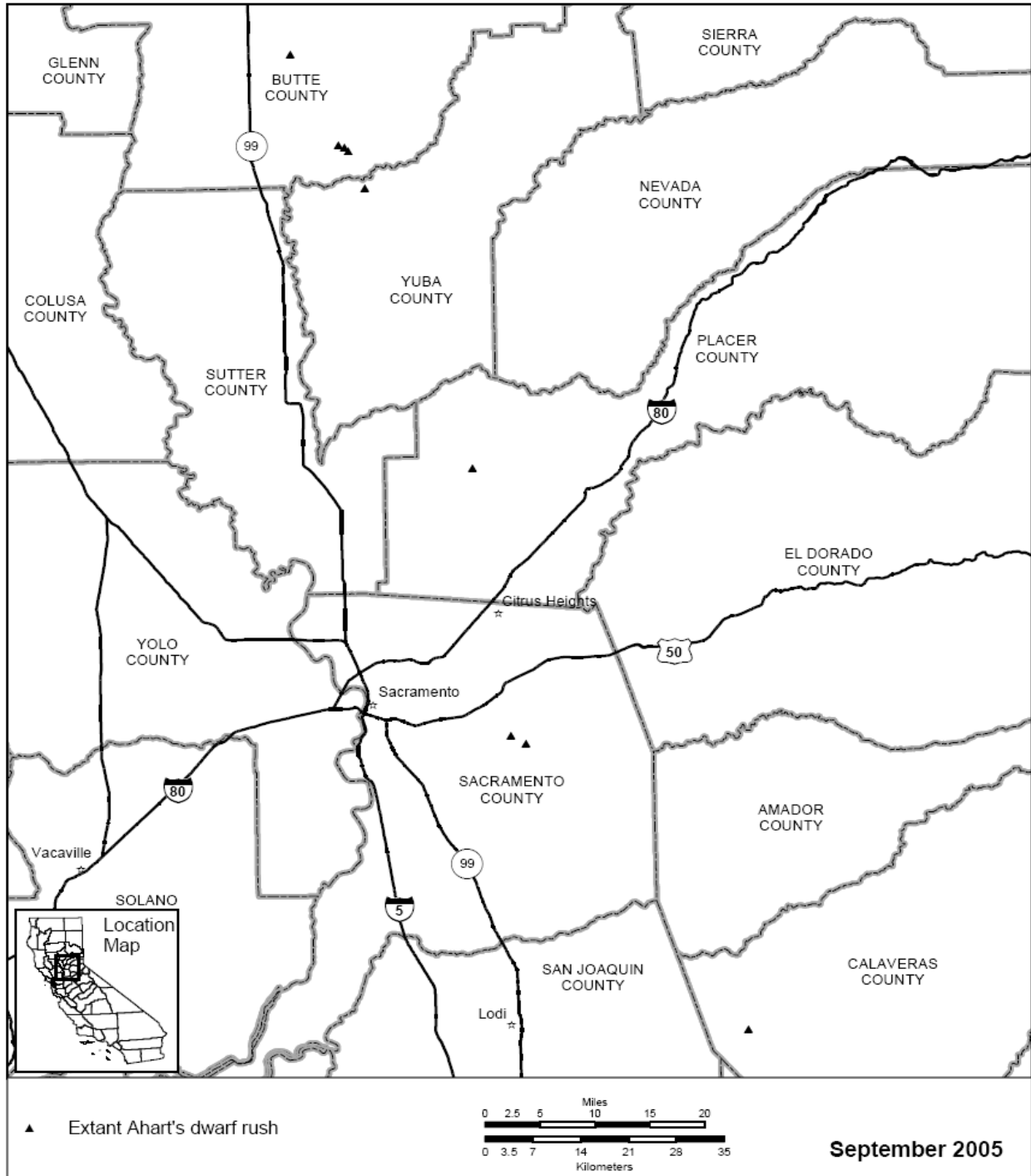
12 **A.31.3 Habitat Requirements and Special Considerations**

13 Little has been reported in the literature on specific habitat requirements of Ahart’s dwarf rush.
14 The taxon is in the rush family (Juncaceae) and is restricted to acidic soils in swales and shallow
15 areas within low-elevation Northern Basalt Flow, Northern Claypan, Northern Hardpan, and
16 Northern Volcanic Mudflow vernal pool types (Ertter 1986, Sawyer and Keeler-Wolf 1995,
17 USFWS 2005).

18 Like most vernal pool plants, Ahart’s dwarf rush is a low-growing, annual species (i.e., it
19 germinates, grows, produces seed, and dies within one year) that is well-adapted to the
20 Sacramento Valley’s Mediterranean-type weather patterns, with its cool, wet winters and hot, dry
21 summers (Zedler 1990). Ahart’s dwarf rush is probably a fairly recent endemic, likely having
22 co-evolved from more common upland species with recent climatic and geologic changes to
23 extreme fluctuation in water availability between winter-spring inundation and spring-summer
24 drought. It is known to thrive on gopher mounds (USFWS 2005).

25 Plants associated with Ahart’s dwarf rush include numerous annual graminoids and forbs that
26 specialize in the higher, less mesic edges of vernal pools. Other documented annual rushes
27 include toad rush (*Juncus bufonius*, native), leafy bracted rush (*J. capitatus*, not native), and
28 inch-high dwarf rush (*J. uncialis*, native). Other documented co-occurrences include annual
29 hair-grass, (*Deschampsia danthonoides*, native annual grass), Sacramento pogogyne (*Pogogyne*
30 *zizyphoroides*, native annual herb), marigold navarretia (*Navarretia tagetina*, native annual
31 herb), smooth cat’s ear (*Hypochaeris glabra*, nonnative invasive annual herb), hyssop loosestrife
32 (*Lythrum hyssopifolium*, nonnative invasive herb, annual or perennial), hawkbit (*Leontodon*
33 *taraxicoides*, nonnative perennial herb), cowbag clover (*Trifolium depauperatum*, native annual
34 herb) and Fremont’s goldfield (*Lasthenia fremontii*, native annual or perennial herb) (Hickman
35 1993, USFWS 2005, CNDDDB 2007).

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Figure A-31.2 Distribution of Ahart’s Dwarf Rush in California (USFWS 2005)

1 In the deeper parts of vernal pools where Ahart’s dwarf rush has been documented, associated
2 species include great valley eryngo (*Eryngium castrense*, native perennial herb), bractless
3 hedgehyssop (*Gratiola ebracteata*, native annual herb), tricolor monkey-flower (*Mimulus*
4 *tricolor*, native annual herb), American pillwort (*Pilularia americana*, native fern), bristled
5 downingia (*Downingia bicornuta*, native annual herb), folded calicoflower (*Downingia*
6 *ornatissima*, native annual herb), white-headed navarretia (*Navarretia leucocephala*, native
7 annual herb) and water pygmyweed (*Crassula aquatica*, native annual herb). Nonnative invasive
8 grasses that can colonize the upper edges of vernal pools and encroach on Ahart’s dwarf rush
9 habitat include facultative wetland species Italian rye-grass (*Lolium multiflorum*) and
10 Mediterranean barley (*Hordeum marinum* var. *gussoneanum*) (Hickman 1993, USFWS 2005,
11 Calflora 2007, CNDDDB 2007).

12 **A.31.4 Life History**

13 The life history of Ahart’s dwarf rush has not been studied in detail (USFWS 2005). Flowering
14 occurs in mid-spring (late March-May), and flowers are wind-pollinated, but conditions
15 necessary for germination are unknown (Ertter 1986, USFWS 2005). The Recovery Plan states
16 that in dry years individual plants have a single stem, and that populations tend to be larger in
17 wet years than dry (USFWS 2005).

18 **A.31.5 Threats**

19 Threats to vernal pool and surrounding habitat in the Plan Area, including Ahart’s dwarf rush
20 habitat, are described in the Recovery Plan (USFWS 2005) and include the following:

- 21 • Habitat loss and fragmentation consequent to urbanization, agricultural conversion, and
22 mining; and habitat alteration and degradation due to changes to natural hydrology,
23 invasive species, incompatible grazing regimes (including insufficient grazing for
24 prolonged periods), infrastructure projects (such as roads and utility projects),
25 recreational activities (such as off-highway vehicles and hiking), erosion, climatic and
26 environmental change, and contamination.
- 27 • Conversion of land uses from intact natural communities (primarily grasslands) or
28 livestock pastures to more intensive agricultural uses, such as croplands; or from one
29 crop-type to another (USFWS 2005).
- 30 • Competition from invasive species is a factor contributing to the decline of plant species
31 in these habitat types. Ahart’s dwarf rush may be threatened by increasing dominance by
32 competitors such as Italian rye-grass, Mediterranean barley, and waxy mannagrass
33 (*Glyceria declinata*), which may in turn contribute to changes in hydrology and livestock
34 grazing practices (USFWS 2005).
- 35 • Changes in hydrology that result in a change in the timing, frequency, and duration of
36 inundation in vernal wet Ahart’s dwarf rush habitat can reduce suitability for the
37 species. The hydrology in vernal pool and adjacent habitats has been altered by

1 construction of flood control structures, such as levees and other water barriers, and by
2 changes in runoff caused by activities such as irrigation or construction of roads and
3 culverts (USFWS 2005).

- 4 • The decline of pollinator species due to habitat fragmentation and the loss of upland
5 habitats that support pollinators is a potential threat. Specific insects that pollinate
6 Ahart’s dwarf rush have not yet been identified; therefore, it is not possible at this time to
7 assess their status and determine if protection of pollinators or their habitat is necessary.
8 If essential pollinators are declining through habitat loss, however, Ahart’s dwarf rush
9 may be declining in response (USFWS 2005).
- 10 • Ahart’s dwarf rush populations are geographically restricted, isolated, and some have
11 small numbers of individuals in some populations and years (CNDDDB 2007). Genetic
12 drift, inbreeding, and reduced gene flow may result from small numbers of populations or
13 small number of individuals per occurrence (Elam 1998). Additionally, small
14 populations are threatened with extirpation from random events such as extreme weather
15 and lack of genetic diversity. Small and/or less genetically diverse populations are less
16 likely to adapt and survive environmental changes, even relatively minor events (USFWS
17 2005).
- 18 • Several other threats to vernal pool habitat and associated species were identified in the
19 Recovery Plan. Water contamination can occur from use of herbicides, fertilizers, and other
20 chemicals commonly used in urban and agricultural settings. At the time of discovery, some
21 populations of Ahart’s dwarf rush were in or adjacent to agricultural fields. Fertilizers may
22 contribute to the growth of invasive plants (USFWS 2005). Habitat alteration may also occur
23 due to large-scale climate and environmental changes, such as global warming, that lead to
24 changes in precipitation pattern and atmospheric conditions (USFWS 2005).
- 25 • Inappropriate timing, intensity, kind/class of animal, or duration of livestock grazing may
26 also negatively impact vernal pool species, including Ahart’s dwarf rush (Barry 1998,
27 Marty 2005).

28 **A.31.6 Relevant Conservation Efforts**

29 Red Bluff dwarf rush is proposed for coverage under the Placer County Conservation Plan
30 (Placer County 2011 draft). The only other documented effort has been the establishment of a
31 preserve near the Oroville Municipal Airport, where plants were lost during a runway expansion
32 project (CNDDDB 2007).

33 **A.31.7 Species Habitat Suitability Model**

34 **A.31.7.1 Habitat**

35 Ahart’s dwarf rush habitat includes areas in the following BRCP mapped land cover types:

- 1 • Vernal pools;
- 2 • Altered vernal pools; and
- 3 • Grassland with vernal swale complex.

4 Vernal pools that may support Ahart’s dwarf rush habitat may also occur as inclusions in
5 mapped grassland, blue oak savanna, ranchettes—open, and disturbed ground land cover types.
6 These inclusions were not mapped because they did not meet the mapping criteria for vernal
7 pool, altered vernal pool, and grassland with vernal swale complex land cover types.

8 **A.31.7.2 Assumptions**

9 Ahart’s dwarf rush is restricted to swales and shallow areas within low elevation Northern Basalt
10 Flow, Northern Claypan, Northern Hardpan, and Northern Volcanic Mudflow vernal pool types
11 (Sawyer and Keeler-Wolf 1995, USFWS 2005). The species specialize on higher, less mesic
12 edges of vernal pools but has also been documented in deeper parts of vernal pools (USFWS
13 2005). Microhabitats from which the plants have been reported are the edges of vernal pools,
14 bottoms of intermittent drainages, and on pocket gopher (*Thomomys* species) and ground squirrel
15 (*Spermophilus* species) mounds (USFWS 2005).

16 Given these habitat preferences, suitable habitat for the Ahart’s dwarf rush is defined as the
17 vernal pool, altered vernal pool, and grassland with vernal swale complex land cover types
18 within the Plan Area.

19 **A.31.8 Recovery Plan Goals**

20 A general statement for recovery of Ahart’s dwarf rush and the other rare and listed vernal pool
21 species is presented in the Recovery Plan: to ensure protection of the full geographic, genetic and
22 ecological extent of this species and to improve the circumstances that caused its decline.
23 Declines must be halted and reversed, and the taxon must be restored to the point where
24 populations are stable or increasing without active human intervention (USFWS 2005). Little is
25 known about Ahart’s dwarf rush population dynamics and many aspects of its lifecycle;
26 therefore, restoration must be iterative and management adaptive.

27 **A.31.9 References**

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