5-YEAR REVIEW

Ash Meadows ivesia (*Ivesia kingii* var. *eremica*)

Photo by Peter Pearsall, U.S. Fish and Wildlife Service, June 2020

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GENERAL INFORMATION:

Species: Ash Meadows ivesia (*Ivesia kingii* var. *eremica*)
Date listed: May 20, 1985
FR citation(s): 50 FR 20777
Classification: Threatened

BACKGROUND:

Most recent status review: The status of Ash Meadows ivesia has not been reviewed since the species was listed.

FR Notice citation announcing this status review: 84 FR 36116, Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 58 Species in California, Nevada, and the Klamath Basin of Oregon, July 26, 2019.

ASSESSMENT:

Information acquired since the last status review:
This 5-year review was conducted by the U.S. Fish and Wildlife Service's (Service) Southern Nevada Fish and Wildlife Office. Data for this review were solicited from interested parties through a Federal Register notice announcing this review on July 26, 2019 (84 FR 36116). We also contacted the Nevada Division of Forestry (NDOF), the Nevada Natural Heritage Program (NNHP), the United States Bureau of Land Management (BLM) Southern Nevada District Office, the United States Geological Survey (USGS) Henderson Field Station, the Clark County Desert Conservation Program, the Rancho Santa Ana Botanic Garden, the Desert Research Institute, the Nevada Native Plant Society, and participants at the 2019 Nevada Rare Plant Workshop to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files.

After review, the Service has concluded that limited new information has become available since the 1985 listing. The new information consists of additional population monitoring and grant specific research. We have provided summaries for this new information below. Additionally, we did not receive any information from the public in response to our Federal Register Notice announcing this 5-year review.

Summary of population monitoring
At the time of listing, the distribution of Ash Meadows ivesia (*Ivesia kingii* var. *eremica*) was unknown (Service 1985, p. 20777). In 1987, Ash Meadows ivesia was known from seven populations within the Ash Meadows area (Knight and Clemmer 1987, pp. 73–74). In 1998, Knight and Clemmer's populations were re-surveyed and re-confirmed, and an additional population of Ash Meadows ivesia at Jackrabbit Spring was discovered (Service, unpubl. survey, 1998). In 2001, Ash Meadows ivesia was estimated to occur across 9 minimum scale occurrences (0.1 mi (0.16 km) separation distance) or 8 maximum scale occurrences (0.6 mi (1 km) separation distance) on approximately 9.1 ac (3.7 ha) (Morefield 2001, p. 1). Refuge-wide

surveys at the Ash Meadows National Wildlife Refuge (Refuge) of listed and rare plants, including Ash Meadows ivesia, were initiated in 2008 and completed in 2010 (BIO-WEST 2011, entire). As a result of these surveys, 9,000 ac (3,642 ha) were surveyed and the approximate Refuge area covered by Ash Meadows ivesia is 116.1 ac (47 ha) (BIO-WEST 2011, pp. 121–123). On these 116.1 ac (47 ha), 19 minimum scale occurrences (0.1 mi (0.16 km) separation distance) or 2 maximum scale occurrences (0.6 mi (1 km) separation distance) were reported (BIO-WEST 2011, pp. 121–123). Distribution of Ash Meadows ivesia is depicted in Figure 1.

At the time of listing, a population estimate of Ash Meadows ivesia was unknown (Service 1985, p. 20777). In 2001, the Ash Meadows ivesia population on the Refuge was estimated to be approximately 3,862 individuals (Morefield 2001, p. 1). Results from the 2008–2010 Refuge-wide rare plant survey produced an estimate that 510,744 individuals are present on the Refuge (Table 1; BIO-WEST 2011, pp. 121–123). This estimate remains the best available for the Refuge population. Estimates of Ash Meadows ivesia individuals on the BLM ACEC and private lands within the Refuge boundary do not exist.

Table 1. Summary of Ash Meadows ivesia population and estimates of individuals at Ash Meadows National Wildlife Refuge.

Population (Service)*	Site Name	BIO-WEST minimum scale occurrence**	BIO-WEST maximum scale occurrence ***	Estimated Number of Individuals	Percent of the population
1	Cold Spring	1	1	2,122	0.42
2	Big Spring Rd S	2	2	8	0.01
	Big Spring Rd N	3	2	195	0.04
	Jackrabbit Spring SE	4	2	5,160	1.01
	Ash Meadows Road S	5	2	76	0.01
	Jackrabbit Spring NW	6	2	2,620	0.51
	Spring Meadows Rd	7	2	227,328	44.51
	Horseshoe Marsh	8	2	5,550	1.09
	Lower Crystal Marsh	9	2	11,131	2.18
	Collins Ranch S	10	2	200,532	39.26
	Crystal Reservoir E	11	2	16,437	3.22
	Crystal Reservoir W	12	2	1,522	0.30
	Collins Ranch N	13	2	2,026	0.40
	Marsh Spring	14	2	33,542	6.57
	Warm Springs 1	15	2	177	0.03
	Skuggs Spring E	16	2	150	0.03
	Skuggs Spring W	17	2	408	0.08
	Warm Springs 2	18	2	1,735	0.34
	Warm Springs 3	19	2	25	0.01
Total				510,744	100

*Population (Service) = Populations aggregated according to NatureServe 2004.
**BIO-WEST minimum scale occurrence = 0.16 km or 0.1 mi separation distance.
***BIO-WEST maximum scale occurrence = 1 km or 0.6 mi separation distance.

Research and/or grant supported activities

I. *Contributions of Insect Pollinators to the Reproductive Fitness of 12 Rare Plants on Ash Meadows National Wildlife Refuge (BIO-WEST 2009):*
This study: (1) identified the floral visitors of 12 rare plant species on the Refuge; (2) identified plant species that support a large portion of the Refuge's insect pollinator community; and (3) identified habitat preferences and locations of insect pollinators nest sites relative to the 12 rare plant species (Tanner *et al.* 2012).
Project status: Completed.

II. *Inventory of Moisture and Salt Distribution in Soils and Sediments that Support Threatened and Endangered Plants in the Ash Meadows National Wildlife Refuge (Breit in prep):*
Auger holes and excavations were used to inventory the vertical and lateral distribution of salts in soils and sediment at 20 sites known to contain protected plant species and at eight sites lacking those plants. Two sites were instrumented with soil moisture sensors so that Refuge staff can monitor long-term change. Information from this project will help to identify suitable sites for expansion and restoration of threatened and endangered plants as well as provide baseline data on the full extent of impacts from water extraction within the Amargosa Desert Hydrographic Basin.
Project Status: Year one progress report is complete, final report is in progress.

III. *Landtypes, Ash Meadows National Wildlife Refuge (White Horse Associates 2010):*
From 2007 to 2009, landtypes were mapped to better define the physical and hydrologic setting for biological studies of rare and endemic species, to help plan future restoration efforts, and to provide information on resources to better inform management decisions on the Refuge. The approach entailed two phases: (1) Stratify the Refuge into preliminary landtype classes distinguished by topographic, geomorphic, hydrologic, soil, and vegetative parameters and (2) Redefine and focus preliminary landtype classes towards the needs of other biological studies, restoration planning, and general management application.
Project Status: Completed.

IV. *Reproductive Biology of the Rare Plants Ash Meadows National Wildlife Refuge (Pavlik and Moore 2012):*
From 2008 to 2009, subpopulations of eleven rare plant taxa were mapped and marked on the Refuge. The three main goals for the project were: (1) Resolve demographically based patterns of phenology and reproductive output that will help to link rare plant biology to pollinator identification, activity, and habitat requirements; (2) Determine the breeding systems of rare plants from integrating parallel, demographically based studies of reproductive biology; and (3) Recommend general conservation and restoration prescriptions based on breeding systems and reproductive biology of rare plants on the Refuge.
Project Status: Completed.

V. *Vegetation Community Mapping and Rare Plants Survey (BIO-WEST 2011):*
From 2007 to 2009, vegetation and rare plant studies were conducted to locate and map the distribution of rare and listed plants on the Refuge. In addition, vegetation

communities were mapped and classified to the alliance and association scale (most specific levels of vegetation classification) throughout the entire Refuge. The information provided in the 2011 Vegetation Community Mapping and Rare Plants Survey Final Report, will assist with planning future habitat restoration activities (BIO-WEST 2011, entire, plus appendices).
Project Status: Completed.

VI. *Water and Soluble-Salts in Soils Relative to the Distribution of Endemic Plants at Ash Meadows National Wildlife Refuge, Nevada (Breit in prep):*
The objectives of this project are: (1) Describe the distribution and composition of soluble-salts and water in the unsaturated zone within areas with varied populations of endemic plants; (2) Interpret the plant distribution in context of geochemical and hydrologic processes known to be active in arid soils and sediments; and (3) Synthesize the findings to provide a generalized view of changes in the distribution of water and salt that might result from increasing aridity as a result of climate change, modification of hydrologic resources, and development of private in-holdings (Breit and McKelvey 2010, pp. 1–7).
Project Status: In prep.

VII. *Protocol Survey Report 2014-2019: Monitoring of Nine Endemic Rare Plants (Miller 2019):*
The objectives of this report are: (1) Summarize the existing dataset and evaluate the status of the nine endemic plant species using established viability analysis (Moore O'Leary et al. 2019); (2) Evaluate management objectives for nine endemic plant species at the refuge (Moore O'Leary et al. 2019); and (3) Evaluate protocol performance and implementation as the first independent implementation of the protocol.
Project Status: In prep.

Conclusion:

After reviewing the best available scientific information, we conclude that Ash Meadows ivesia (*Ivesia kingii* var. *eremica*) remains a threatened species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and the analysis of the status of the species conducted when the Service determined that the species warranted listing, remains an accurate reflection of the species current status.

RECOMMENDATIONS FOR FUTURE ACTIONS:

I. Monitor compliance with Nevada Revised Statute Order 1197A (January 12, 2018), *Curtailment of New Appropriations of Groundwater within the Amargosa Valley Hydrographic Basin 230*, that prohibits new applications for water or water diversions within 25 miles of Devils Hole (and by proximity Ash Meadows NWR). Order 1197A supersedes 1197, which imposed similar regulations at 10 miles from Devils Hole. Water levels in Devils Hole are affected by pumping centers in the Amargosa Desert and the Ash Meadows groundwater basins (Halford and Jackson 2020).

II. Collaborate with the Ash Meadows NWR to implement the *Desert National Wildlife Refuge Complex – Ash Meadows, Desert, Moapa Valley, and Pahranagat National Wildlife Refuges Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I – August 2009* (Service 2009) and also the Draft Ash Meadows Natural Resource Management Plan in review (Service 2020); and

III. Support Ash Meadows ivesia research at the Ash Meadows NWR to monitor the population as identified in the *Recovery Plan for the Endangered and Threatened Species of Ash Meadows* (Service 1990); and

IV. Monitor the future activity of mineral rights in the Ash Meadows area. The BLM ACEC surrounding the refuge is withdrawn from mining and entry until 2029 (PLO# 7737, signed November 2nd, 2009), but requires renewal every 20 years. Mining can still occur on private inholdings within the refuge, but no active mining permits exist at this time.

Lead Field Supervisor, Fish and Wildlife Service

Approve GLEN KNOWLES Digitally signed by GLEN KNOWLES Date: 2020.09.30 16:24:28 -07'00' _____ Date _____

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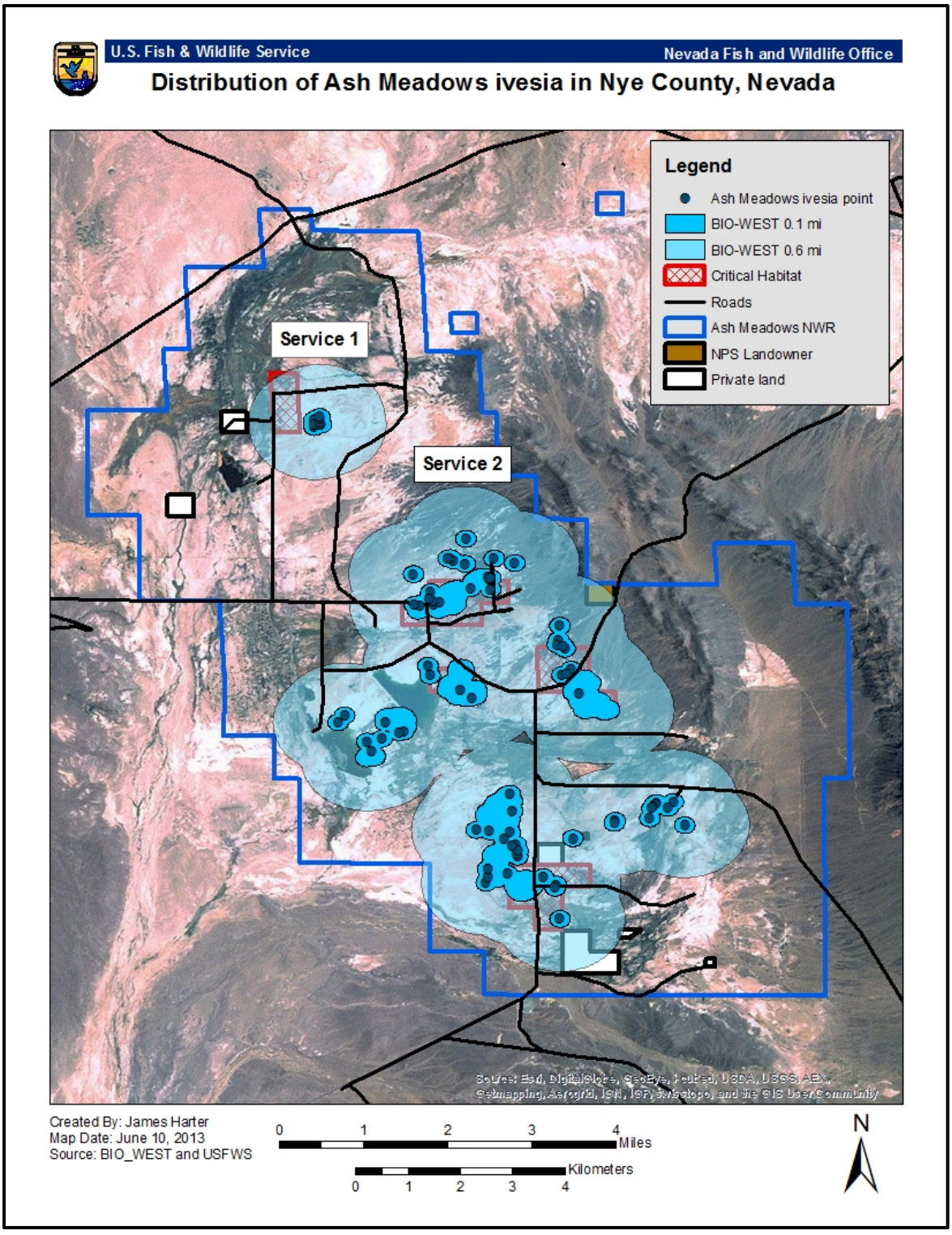

Figure 1. Distribution of Ash Meadows ivesia in Nye County, Nevada. Circles represent individual plants. BIO-WEST's 0.16 km (medium blue) and 1 km (transparent blue) separation distances are depicted on the map for reference; however, populations are highlighted by their Service population number derived according to NatureServe mapping standards (NatureServe 2004, entire).