

Ioneer's Buckwheat Protection Plan Summary: Proposed Conservation Measures for Tiehm's Buckwheat and Critical Habitat



Introduction and Background

Ioneer's Rhyolite Ridge Lithium-Boron Project (Project) is located in Esmeralda County, Nevada, approximately 160 miles southeast of Reno in the Silver Peak Range. On December 15, 2022, the U.S. Fish and Wildlife Service (USFWS) listed Tiehm's buckwheat as an endangered species under the Endangered Species Act (ESA) and designated approximately 910 acres of critical habitat for Tiehm's buckwheat.

Critical habitat are areas identified by the USFWS as essential for a listed species conservation. These areas do not have to include land occupied by the listed species. For Tiehm's buckwheat, critical habitat includes the approximately 10 acres of occupied habitat suitable for the species and approximately 900 acres of surrounding land that has been identified because of their potential to support pollinators for Tiehm's buckwheat.

As described by the USFWS, "critical habitat is a tool that supports the continued conservation of imperiled species by guiding cooperation within the federal government." Designation of critical habitat only affects federal agency actions or federally funded or permitted activities. It does not establish a refuge, reserve, preserve, or other conservation area and projects are able to proceed, though sometimes with modification, to minimize effects and avoid adversely modifying critical habitat.¹

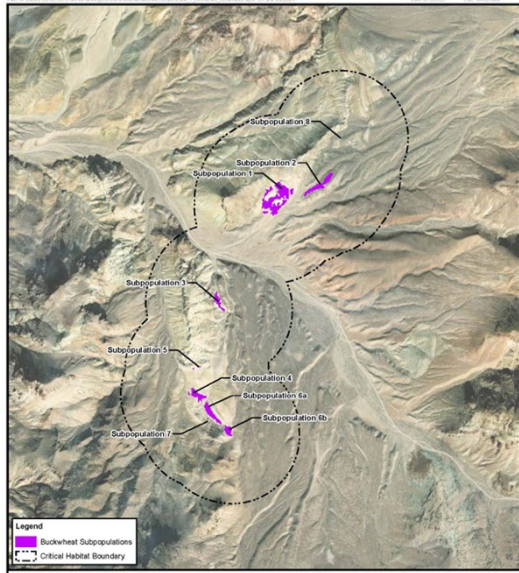
As part of publication of the [Final Environmental Impact Statement](#) (EIS) by BLM on September 20, 2024, the USFWS also formally released the [ESA Section 7 Biological Opinion](#), concluding Ioneer's Rhyolite Ridge Lithium-Boron Project will not jeopardize the ESA-listed Tiehm's buckwheat or adversely modify its critical habitat. Its issuance marks the end of the ESA consultation process between USFWS and the BLM regarding Rhyolite Ridge.

Ioneer began working with the USFWS and the BLM to provide for conservation of the species long before the listing of the species or the designation of critical habitat. These efforts included proposals for conservation actions related and not related to the Project. Ioneer has been voluntarily conducting demographic monitoring, seed collection and seed banking, and constructed a dedicated green house to propagate Tiehm's buckwheat. Ioneer has committed to continuing these and other studies throughout the life of the Project.



Tiehm's buckwheat at Ioneer's Conservation Center, May 2023

¹ <https://www.fws.gov/project/critical-habitat>



Ioneer Proposed Conservation Measures

The conservation measures Ioneer has proposed were developed with input from the USFWS and BLM. These measures reflect substantial changes in proposed quarry development, haul road location, overburden storage facility design, and other infrastructure, as well as other specific conservation measures related to mine operations and reclamation to avoid and minimize impacts to Tiehm’s buckwheat and its designated critical habitat.

As anticipated, this collaborative effort resulted in additional refinements and enhancements to the Plan as the ESA Section 7 consultation progressed. The final version of the Buckwheat Protection Plan (Revision 5.2 submitted on July 17, 2024) includes relocation of the haul road and three additional APCMs.

The APCMs have continued to evolve and expand as the USFWS, BLM and Ioneer have worked closely to identify and address potential Project impacts to Tiehm’s buckwheat and impacts to critical habitat. These changes are reflected in the changes to the June 2023 version of the Buckwheat Protection Plan. Subsequent drafts are included in the Threatened and Endangered Species Supplemental Environmental Report of the Draft and Final Environmental Impact Statement.²

APCMs that Ioneer has or will be taking to protect Tiehm’s buckwheat while providing minerals essential to address global environmental issues include:

- APCM-1. Avoidance of Tiehm’s Buckwheat and Designated Critical Habitat.
- APCM-2. Geotechnical Design of the Quarry Walls to Provide Appropriate Margins of Safety.
- APCM-3. Geotechnical Monitoring.
- APCM-4. Establish Fencing and Signage to Protect Tiehm’s buckwheat and Critical Habitat Designated for Tiehm’s buckwheat.
- APCM-5. Restrict Public Access to the County Road.
- APCM-6. Development of a Pollinator Habitat Reclamation Program Within Critical Habitat.

² Buckwheat Protection Plan within Supplemental Environmental Report of the Draft Environmental Impact Statement: <https://eplanning.blm.gov/eplanning-ui/project/2012309/570>

Throughout permitting process, Ioneer’s and the agencies’ focus has been on providing and communicating the necessary information to the public. The U.S. federal government requested of Ioneer detail their proposed conservation measures (APCMs) to outline the activities being proposed by Ioneer to avoid and minimize Project impacts to Tiehm’s buckwheat and its critical habitat. This information provided a key element of the BLM’s biological assessment, which was submitted to the USFWS to initiate formal consultation required by the ESA.

Ioneer has continued to update and refine its Buckwheat Protection Plan in response to ongoing consultation efforts and input provided by the FWS and the BLM. A summary of Ioneer’s proposed conservation measures is provided below and the Buckwheat Protection plan can be found [HERE](#).

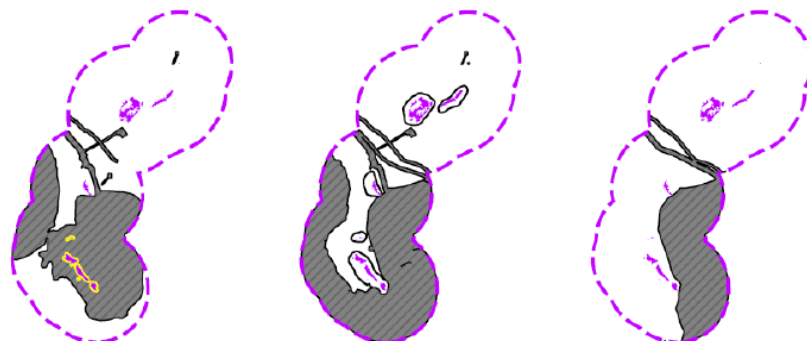
- APCM-7. Control of Nonnative, Invasive, and Noxious Species.
- APCM-8. Light Management to Minimize Adverse Impacts to Pollinators.
- APCM-9. Dust Control and Monitoring of fugitive dust emissions within Tiehm’s Buckwheat Subpopulations.
- APCM-10. Remove fencing and debris from the three UNR transplant experimental sites that are located within Tiehm’s buckwheat critical habitat.
- APCM-11. Utilize blasting mats when any blasting is to occur proximate to Tiehm’s buckwheat subpopulations and trim blasting techniques and charge delays.
- APCM-12. Demographic and Recruitment Monitoring.
- APCM-13. Develop an ERTI-Specific Environmental Awareness Program for Project Employees, Contractors, and Guests.
- APCM-14. Monitor Stormwater Control Measures for Project Activities Located in or with the Potential to Discharge to Critical Habitat.
- APCM-15. Critical Habitat and Subpopulation Monitoring.
- APCM-16. Monitor Insect Visitors and Pollinator Diversity and Abundance
- APCM-17. Monitor Noise Proximate to Tiehm’s Buckwheat Subpopulations
- APCM-18. Develop and Ex-Situ Conservation Program in Cooperation with FWS and BLM.

Select proposed conservation actions are summarized below. A more detailed description of all plan elements can be found [here](#).

Avoidance of Tiehm’s Buckwheat and Designated Critical Habitat (APCM-1) – Ioneer has redesigned significant parts of its Plan of Operations since their original submission in 2020 to avoid impacts to Tiehm’s buckwheat subpopulations and avoid and minimize impacts to designated critical habitat. This has been an iterative process that has included relocation of Project infrastructure, including the haul road. This evaluation required extensive evaluation of slope stability, quarry sequencing, collection of additional geotechnical data, and iterative quarry wall stability assessment along with revision of appropriate mitigative measures to achieve stability requirements.

2020 Proposed Plan of Operations	2022 Proposed Plan of Operations	2023 Applicant Preferred Alt. (North South Alternative)
292.9 acres of disturbance within critical habitat before concurrent reclamation to establish functional pollinator habitat. 2.98 acres of direct impact to Tiehm’s buckwheat subpopulations. Subpopulations 4, 5, 6a, 6b, and 7 affected.	357.2 acres of disturbance within critical habitat before concurrent reclamation to establish functional pollinator habitat. No direct impacts to Tiehm’s buckwheat subpopulations.	191.4 acres of disturbance within critical habitat before concurrent reclamation to establish functional pollinator habitat. No direct impact to Tiehm’s buckwheat subpopulations.

Development of a Pollinator Habitat Reclamation Program Within Critical Habitat (APCM-6) – As part of the proposed concurrent reclamation plan, the Ioneer will enhance reclamation efforts inside of critical habitat to foster faster recovery of pollinator habitat.



The reclamation goals are informed by reference ecosystems but consider how ecological conditions are changed by quarry development. The overall goal of the reclamation is to support the restoration of ecosystem processes and function. Specifically, reclamation efforts inside of critical habitat will be enhanced to accelerate the establishment of habitat suitable for the various life history stages of the diverse pollinator guild that supports

Tiehm's buckwheat (Functional Habitat). As described in the Buckwheat Protection Plan, several methods to enhance the establishment of vegetation within critical habitat will be evaluated during the early phases of concurrent reclamation. These methods will include, but may not be limited to, soil amendments to facilitate establishment of soil biome, establishment of biological soil crusts, enhanced (diversity and quantity) seed mixes, containerized plantings, supplemental irrigation approaches, and salvaged succulents. The validation and the effectiveness of these various methods will be refined and optimized during early phase reclamation efforts, mine years 4 to 18, and prior to implementation of the bulk of reclamation efforts within critical habitat which will begin in Year 19, once buttresses have been constructed to provide for long term stability of the west quarry wall.

Control of Nonnative, Invasive, and Noxious Species (APCM-7) – Loneer will implement a non-native, noxious, and invasive weed species control program within the operations footprint with a particular focus on saltlover (collectively 'weeds') for the life of the Project. Areas of existing disturbance will be evaluated on an annual basis to determine the relative level of infestation and required weed control efforts. Weed treatment will be achieved using herbicide treatments and where appropriate, mechanical removal techniques. Timing of weed control activities is important to the overall success of the effort. Application will take advantage of post emergence when weeds are small and growing rapidly, but prior to the blooming period to prevent seed development.

Light Management to Minimize Adverse Impacts to Pollinators (APCM-8) – Loneer will use dark sky lighting best management practices throughout the operations area to minimize the effects of lighting on pollinators and other wildlife that may be present in the area. These efforts would utilize hooded stationary lights and lighting plants. Lighting will be directed onto the pertinent site only and away from adjacent areas not in use, with safety and proper lighting of the active work areas being a priority. As appropriate and when color rendering is not critical or an important part of the job task, the use of sub-500 nanometer lighting spectra will be limited by using 500nm filtered LED fixtures or pure narrow-band amber LED lamps or their equivalent. To help guide efforts to minimize the potential adverse effects of light from operations on adjacent ecosystems, a qualified light management consultant will be retained to assist Loneer with implementation of this APCM. As a first principle, the implementation of this requirement must comply with safety requirements prescribed by the Mine Safety and Health Administration.

Dust Control and Monitoring of fugitive dust emissions within Tiehm's Buckwheat Subpopulations (APCM-9) – The Air Quality Impact Analysis (AQIA) prepared for the Project has shown that primary and secondary air quality standards are met during the life of the mine project. Contour maps of expected emissions show that within critical habitat, including the subpopulations dust emissions will be less than the primary standards (Trinity Consultants 2024b). Fugitive dust will be controlled on roadways and other areas of disturbance within the Project in accordance with the Project's Air Quality Operating permit and expected dust deposition from haul truck traffic along the haul road where it is closest to buckwheat subpopulations 3 and 6 is estimated to be significantly below trigger values established by dust studies conducted on another endangered plant in Nevada.

Loneer is aware of no studies that look at the effects of dust on Tiehm's buckwheat and proposes as part of this APCM to fund research using Tiehm's buckwheat plants growing in its greenhouse and, if authorized, in situ studies at the site. Such a study would further our understanding of the physiology and growth of Tiehm's buckwheat, and the data will be used to refine thresholds for implementation of management strategies.

Demographic and Recruitment Monitoring (APCM-12) – Loneer will collect quantitative data along previously established transects on an annual basis to estimate the number of plants in each subpopulation and track changes in population density, flower production, and size structure. Every four years a full census of the subpopulations will be conducted. In line with the procedures authorized by endangered species recovery permit (ESPER2424938) and

in accordance with the currently accepted standards determined by the Center for Plant Conservation, Tiehm's buckwheat seed collection will continue and inform long term monitoring of seed set and viability. Viability determinations shall be made by the Ray Selling Berry Seed Bank and Plant Conservation Program where the collected seeds are conserved.

Critical Habitat and Subpopulation Monitoring (APCM-15) – On a quarterly basis, Loneer will engage qualified biological monitors to monitor, on foot, the conservation fencing surrounding undisturbed critical habitat and document general condition of critical habitat, including the Tiehm's buckwheat subpopulations. Monitoring efforts will focus on qualitative assessments of general habitat condition, whether or not the fencing constructed as part of APCM-4 is intact or in need of repair, and if there have been any unauthorized encroachments or disturbance.

Monitoring of Insect Visitors and Pollinator Diversity and Abundance and Noise (APCM-16 and 17) – This monitoring will take place annually. Insect visitors and pollinator diversity and abundance will be conducted using camera and pan traps. Noise monitoring will be conducted proximate to Tiehm's buckwheat subpopulations. These two new monitoring efforts, coupled with previously identified monitoring protocols will be looked at comprehensively with other abiotic and biotic monitoring data on an annual basis.

Conservation Program Development (APCM-18) – The goal of the conservation program is to identify seed collection, seed storage, and propagation requirements and methods to establish Tiehm's buckwheat, grown in an off-site green house, at suitable reclaimed and undisturbed sites. The program would build on Loneer's ongoing seed collection work currently authorized by the USFWS and greenhouse propagation being conducted by Loneer in the purpose-built greenhouse constructed on private lands.