Nevada Natural Heritage Program

Nevada Department of Conservation & Natural Resources

Tiehm buckwheat History & Background

Jim Morefield, *Supervisory Botanist*

NDF Public Workshops
Tonopah and Carson City
July 2020

heritage.nv.gov

Nevada Natural Heritage Program

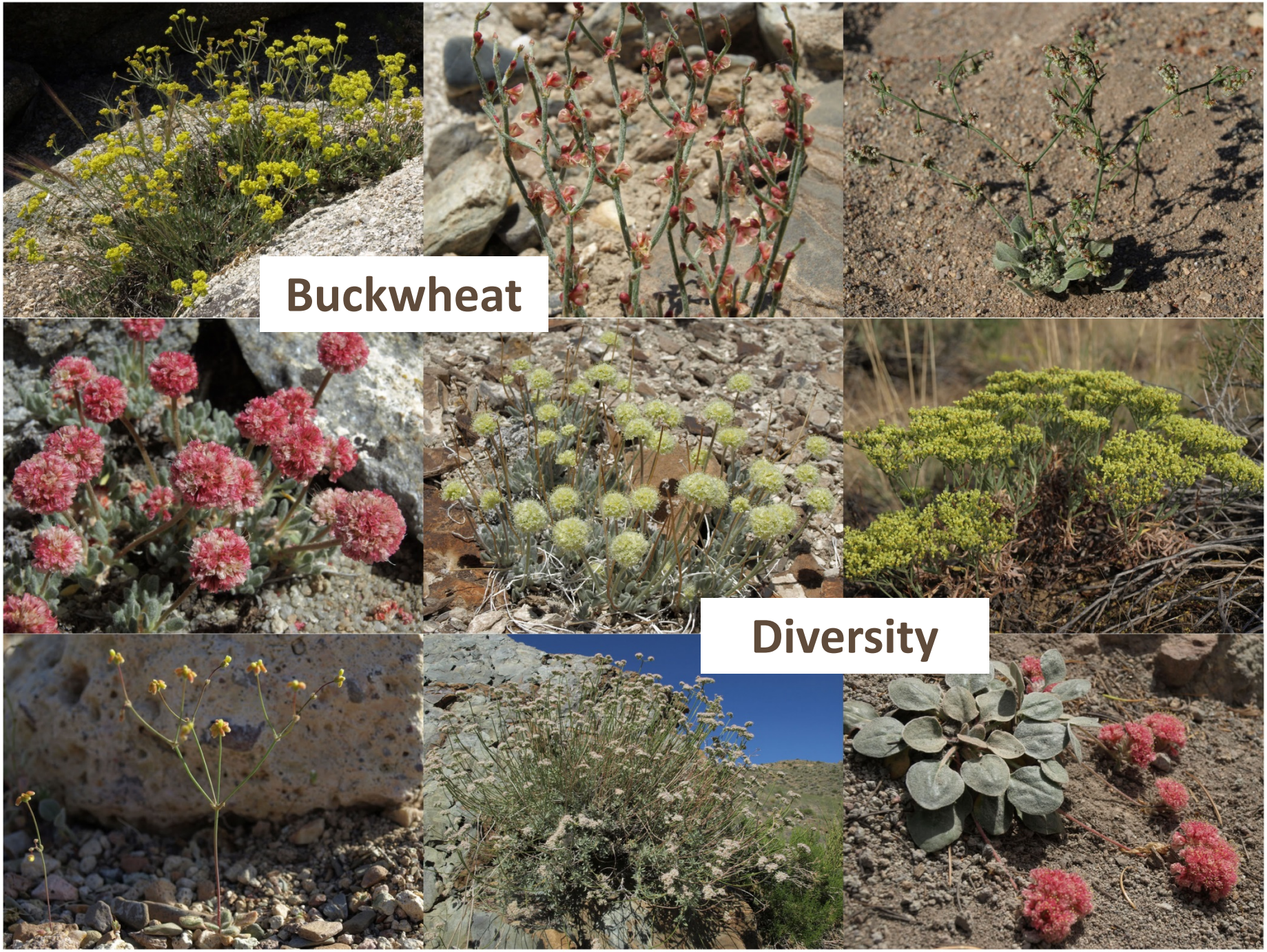
Kristin Szabo
Administrator

Nevada Division of Natural Heritage

- **New name – same mission:**
- **Develop and maintain a cost-effective, central information source and inventory of the locations, biology, and status of all threatened, endangered, rare, and at-risk plants and animals in Nevada.**
- **Scientific advisor to Nevada Division of Forestry**

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES


Buckwheat
Diversity

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Some Background on Buckwheats

- Genus name *Eriogonum* – "woolly knees"
- Cousin of the crop grain – so sometimes called "wild buckwheat"
- Native to North America from Alaska to Mexico
- Unusual diversity of common and rare species
- Often grow on unusual and/or harsh soil types

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Buckwheats by the Numbers

- **1803 – year the first *Eriogonum* species was named**
- **380 – total kinds of buckwheat now known**
- **119 – kinds of buckwheat found in Nevada (about 31% of total buckwheat diversity)**
- **17 – kinds of buckwheat "unique" (endemic) to Nevada, found nowhere else in the world**
- **>14,000 – scientific specimens of buckwheat collected throughout Nevada**

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Buckwheats on the Landscape

- Like most native plants, buckwheats help to:
  - Support pollinators and other wildlife
  - Create and stabilize soils
    (often soils that few other species can colonize)
  - Promote nutrient cycling
  - Maintain ecosystem diversity and resilience
- Past food and medicinal uses are documented
- Buckwheats specializing on harsh soils may carry valuable adaptive genes

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Discovery of Tiehm buckwheat

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Discovery of Tiehm buckwheat
May 18, 1983

Arnold Tiehm, M.S.

(pronounced "team")

- **Nevada's premier modern botanist and plant explorer**
- **>18,000 scientific plant collections spanning 50 years**
- **Collected 3,367 buckwheat specimens throughout NV**
- **Primary Nevada field botanist and data contributor for the 1972-2012 *Intermountain Flora* project**

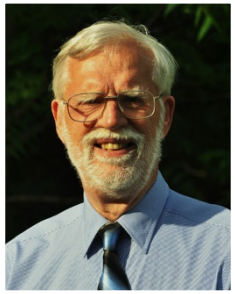
Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Naming of *Eriogonum tiehmii*

by J.L. Reveal, 1985, Great Basin Naturalist, vol. 45, p. 277

Kristin Szabo
Administrator



Dr. James L. Reveal

(1941-2015)

- Was world's foremost expert on buckwheats
- Visited and verified the new species in the field in 1984
- *Flora of North America* and *Intermountaion Flora* author
- Distinguished botanist and plant taxonomist with over 500 peer-reviewed articles and books.

Bradley Crowell
Director

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Distinguishing features of Tiehm buckwheat

- Fresh flowers pale yellow
- Stalked glands on flower parts
- Flower parts all about the same size
- Flower cups (involucres) 4-5 mm long, rigid, deeply lobed
- One flower head per stem
- Stems sparsely woolly, unbranched, leafless above base
- Perennial matted growth habit

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Tiehm buckwheat Major Milestones

- 1983 – species discovered by Tiehm near Rhyolite Ridge
- 1985 – species named as new to science by Reveal, in honor of Tiehm – among the last buckwheats to be named from Nevada
- 1986 – Division of Natural Heritage began tracking the species
- 1994 – field surveys and status report by Tiehm with USFWS Section 6 funding through Division of Natural Heritage
- 1995 – expanded status report compiled by Natural Heritage
- 2008-2010 – GPS re-survey conducted by Natural Heritage
- 2018-2019 – baseline biological surveys conducted by EM Strategies for Ioneer and Bureau of Land Management

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Nevada Natural Heritage Program

Kristin Szabo
Administrator

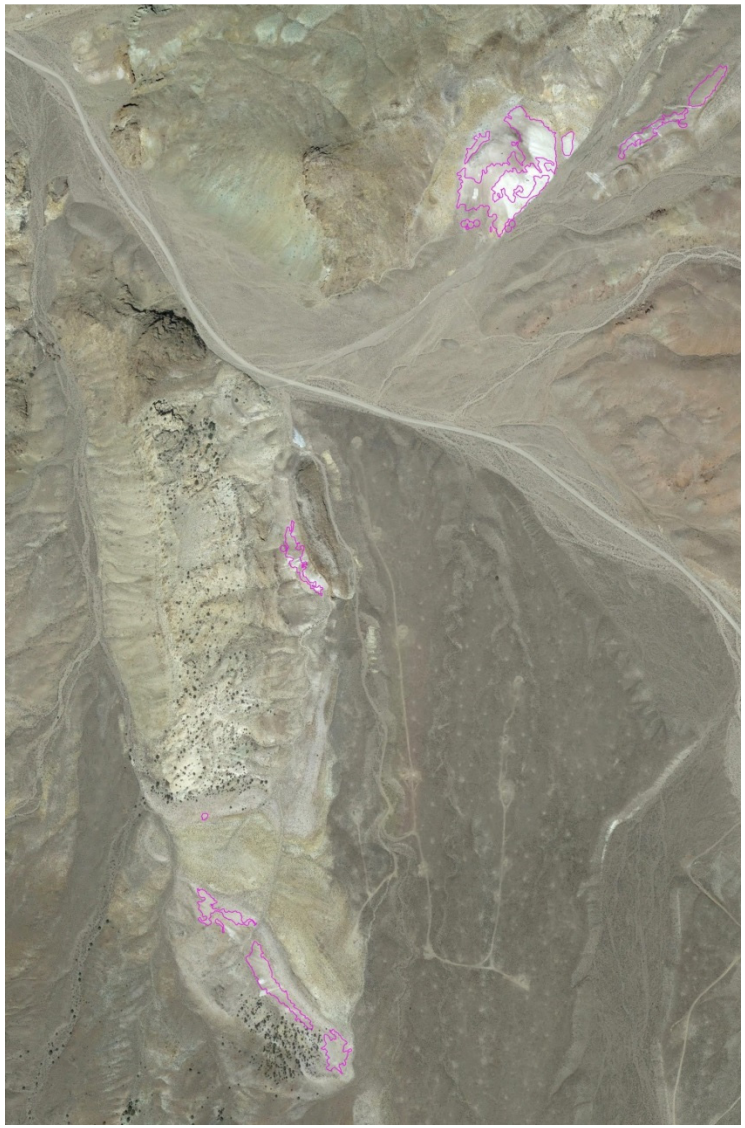
Tiehm buckwheat Major Results 1994 surveys

- Located six principal patches covering less than 22 acres, all within less than one square mile near original 1983 discovery
- All plants confined to specific, poorly developed soils of light-colored, relatively barren rocky clay and silt
- Searched 33 other similar-looking soil patches covering 300 acres within a 15-mile radius, no more Tiehm buckwheat found
- Detected mostly minor impacts from past mineral exploration activities at all sites

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Tiehm buckwheat Major Results
2008-2010 GPS re-survey



- Same six principal patches relocated, refined to 8.75 acres with an estimated 36,540 plants
- Observations of old disturbances – Tiehm buckwheat:
  - can re-colonize light/shallow transient disturbances over time, within its unique soils
  - does not re-colonize heavy/deep, ongoing, or permanent disturbances
  - does not colonize outside of its unique soil type

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Tiehm buckwheat Major Results
2018-2019 EMS / Ioneer baseline biological surveys

- Two more small satellite patches (50 and 1 plant) found nearby
- Much more potential habitat surveyed with negative results
- Census refined with transect data:
  estimated 43,921 plants on 9.98 acres
- Highest density patches on north aspects at highest elevations
- Soils basic (pH 7.64-8.76) with generally high Boron, Sulfur, Potassium, Calcium, and Carbonate
- Seed viability 16 percent, slightly low for native buckwheats

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Tiehm buckwheat Major Results
2018-2019 EMS / Ioneer Baseline Biological Surveys

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Genetics

- **Closest to Shockley buckwheat (*Eriogonum shockleyi*) among four species compared**
- **Differences detected among all four**

Shockley buckwheat (*Eriogonum shockleyi*)

Tiehm buckwheat (*Eriogonum tiehmii*)

Bradley Crowell
Director

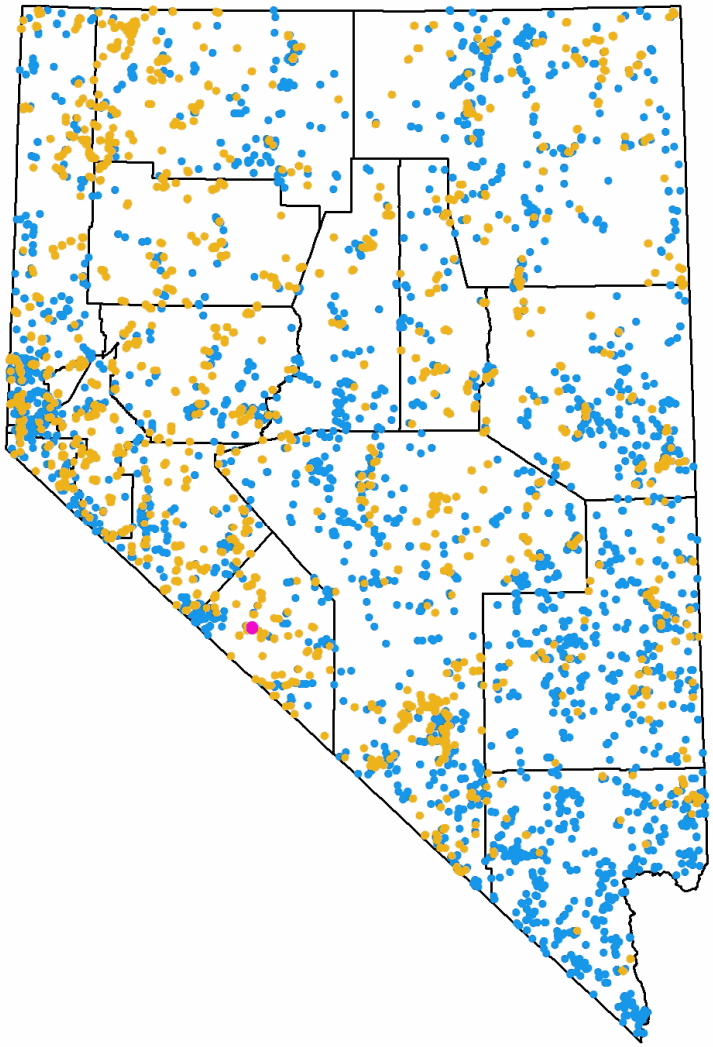
Nevada Department of CONSERVATION & NATURAL RESOURCES

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Historical Survey Effort

- **14,264 databased buckwheat specimen records in Nevada as of June 2020**
- **4,556 personally collected by experts Tiehm and Reveal**
- **Tiehm buckwheat remains a unique endemic of Esmeralda County, found nowhere else in the world**



Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Some Unknowns

- How much loss can Tiehm buckwheat sustain without significant increase to extinction risk?
- Can Tiehm buckwheat survive in perpetuity in any other location(s)?
  - Attempted in northwestern Nevada with Crosby buckwheat (*Eriogonum crosbyae*), another soil specialist species not quite as rare
  - Initially successful, but failed after 30 years

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES

Nevada Natural Heritage Program

Kristin Szabo
Administrator

Questions?

Contact:
Jim Morefield, Ph.D., Supervisory Botanist
Nevada Division of Natural Heritage
775-684-2900 | jdmore@heritage.nv.gov
heritage.nv.gov

Bradley Crowell
Director

Nevada Department of CONSERVATION & NATURAL RESOURCES