A phased approach to improving habitat for a critically endangered species –

An adaptive management lesson

Steve Evans and Pamela Sullivan
Natural Resources Office, Pōhakuloa Training Area
Center for Environmental Management of Military Lands
Colorado State University

Melanthera venosa (E)

Big Island Endemic

1980's

4,150 individuals,
6 pu‘u

2016

119 individuals,
1 pu‘u (Pu‘u Nohona o Hae)

~ Joseph F. Rock ~ 1913 ~

"The vegetation begins to become interesting at Huehue, near the lava flows and the northern flanks of Hualalai, and reaches its culminating point at Puu Waawaa, the richest, flat location of any in the whole territory." ."

"From Keaumoku on, the country is flat and mainly grassland..."

"The country is extremely dry, and when very windy the dirt is carried for miles and so thickly that everything appears to be hazy as in a dense mist or fog."

"Of interest in this locality is the large crater Nohonaohae, as it harbors still some of the original vegetation which covered these lands before they were stocked with cattle and sheep."

Impacts:

- Fire
- Cattle and other ungulates
- Invasive plants
- Erosion

Objective:

Removal of *Cenchrus setaceus*, recovery of native species to promote community structure, and allow *Melanthera venosa* to recover and be self-sustaining.

Strategy:

- Natural recovery of community structure
- Create conditions for *M. venosa* to respond
- Do no harm

Implementation:

- Hand cut *C. setaceus* to 1 ft in height within 1 m of *M. venosa*
- Apply herbicide
- Cut *C. setaceus* to ground in remaining weed control buffer
- Apply herbicide
- Maintain buffer quarterly

Challenges:

- Declining *M. venosa* numbers
- Increasing *C. setaceus* density
- Common natives present under *C. setaceus* – covering and shading out
- Terrain
- High winds

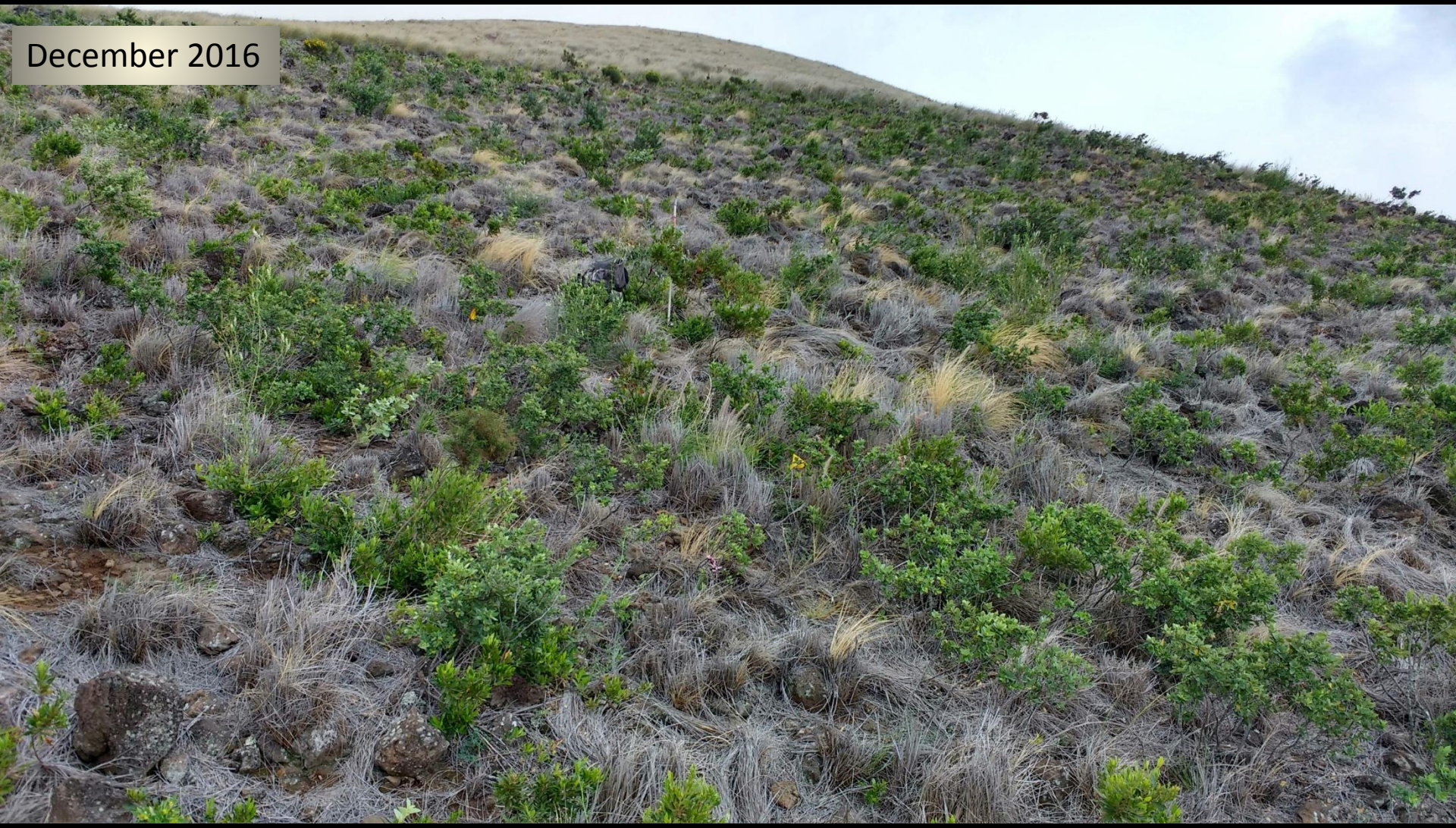
Outcomes in 2016:

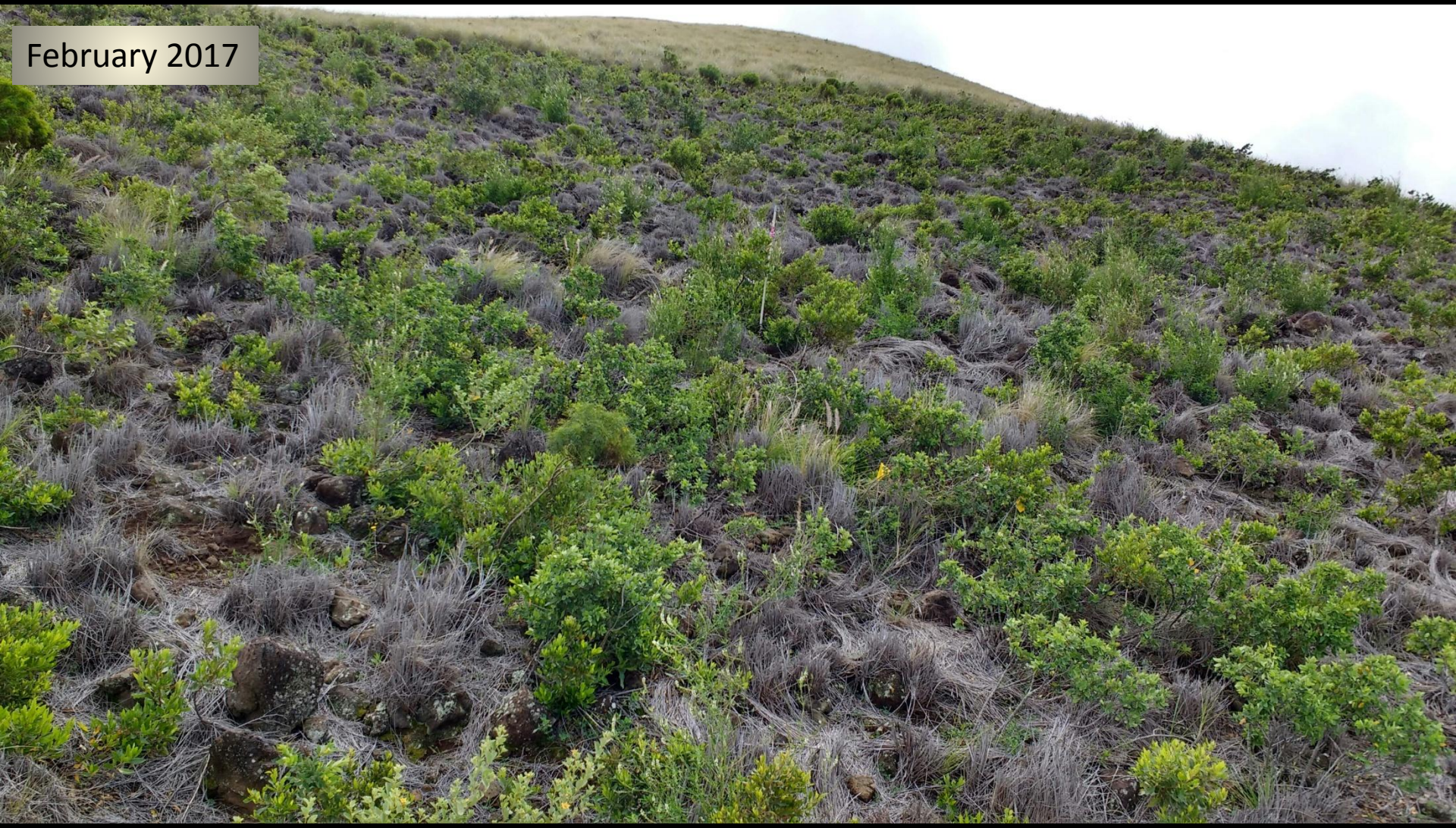
- Effort:
  - Weed control buffer of ~ 5 ac
  - Hand cutting – 290 hrs
  - Weed whacking – 180 hrs
  - Herbicide – 79 hrs & 51 gal
- Reduced *C. setaceus* density
- Native community
- Effects to *M. venosa*
  - Rapid Assessment Monitoring
  - *Adaptive management lesson*


January 2016


February 2016


June 2016


December 2016


February 2017

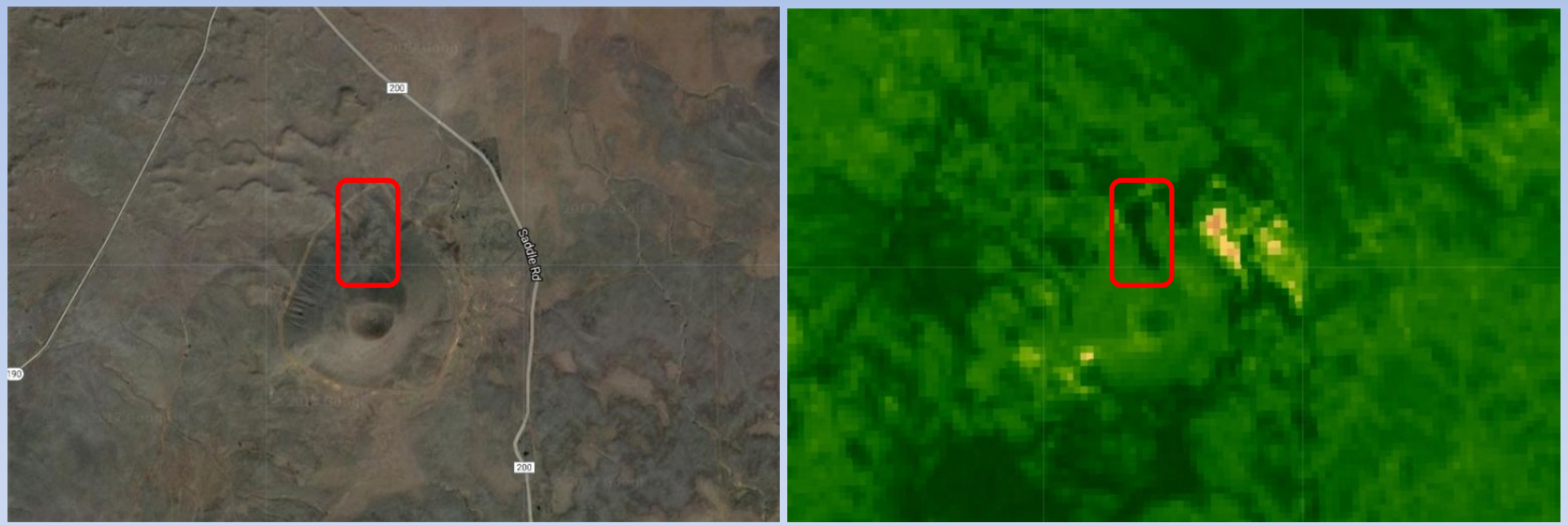

February 2017


February 2017

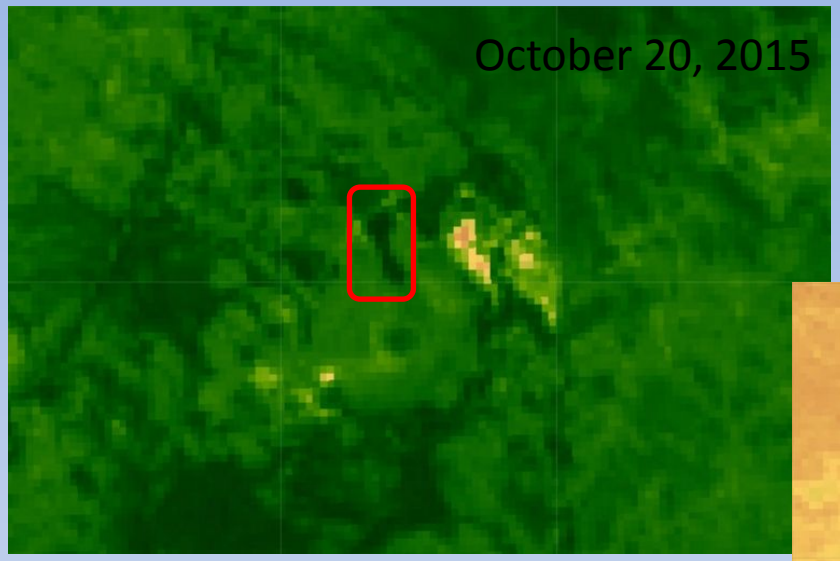

January 2017

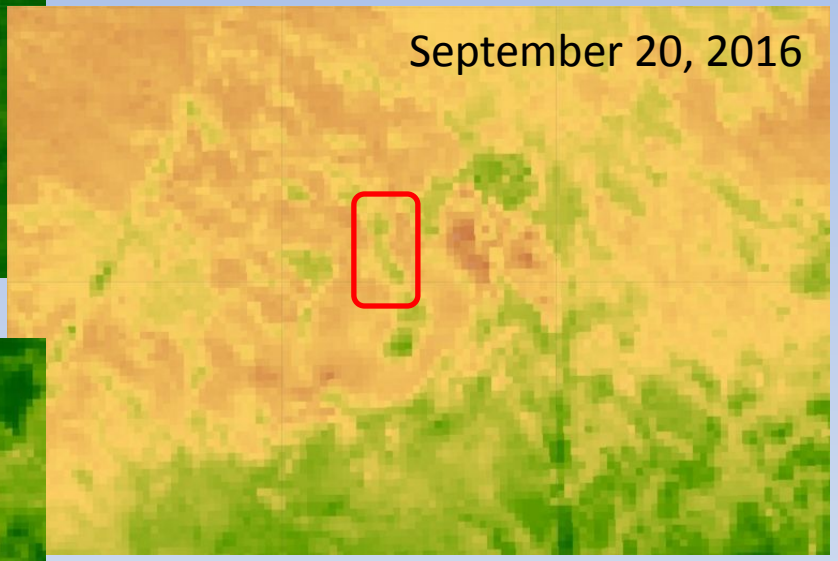
Normalized Difference Vegetation Index (NDVI)

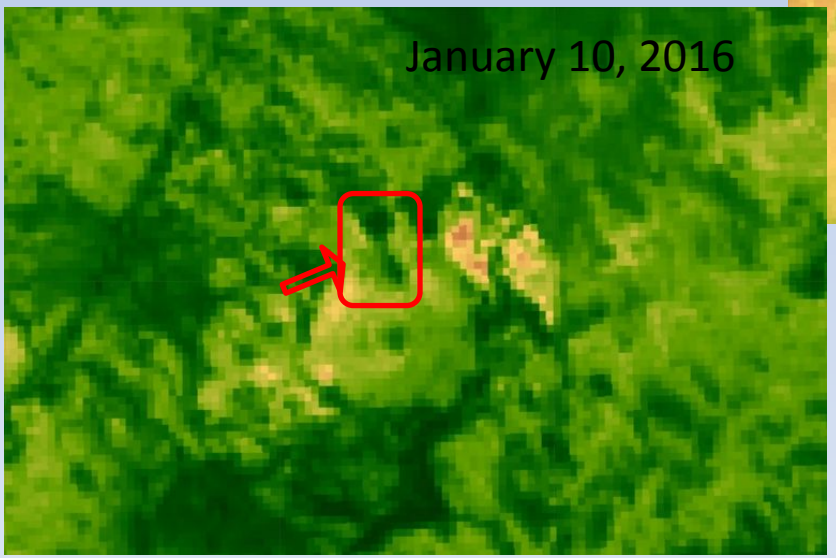
October 20, 2015



Google Earth Engine


October 20, 2015


September 20, 2016


January 10, 2016

Goals 2017:

- Habitat improvement with less common natives
  - *Dodonaea viscosa* abundant
  - Herbarium and historic records
  - Species distribution models

- Augmentation of *M. venosa*

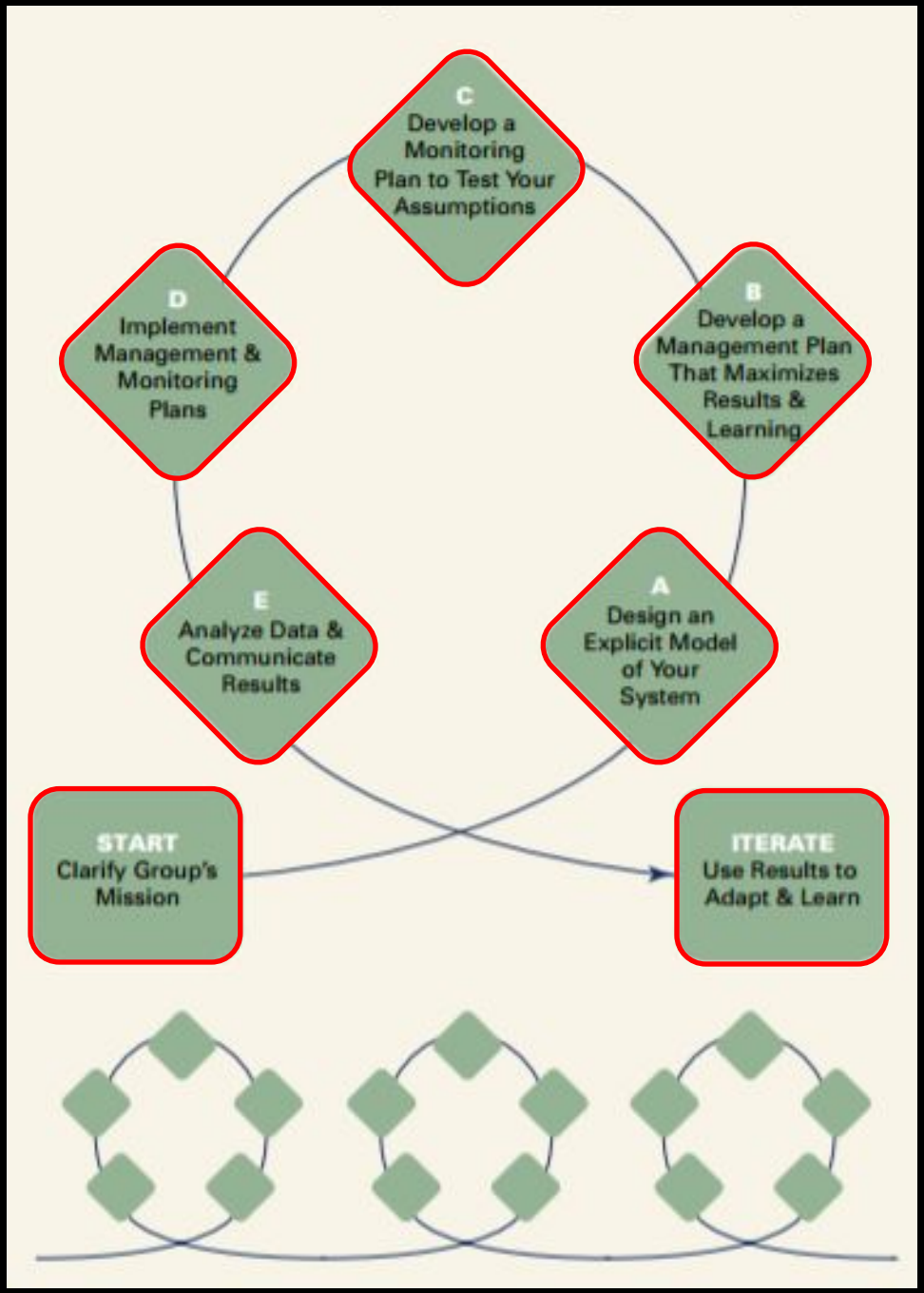
- Apply a revised adaptive management approach to other listed species

“Adaptive management incorporates research into conservation action. Specifically, it is the integration of design, management, and monitoring to systematically test assumptions to adapt and learn.”

Salafsky, N., R. Margoluis, and K. Redford. 2001. Adaptive management: A tool for conservation practitioners. Washington, D.C.: Biodiversity Support Program.

“Thus, learning is an inherent objective of adaptive management. As we learn more, we can adapt our policies to improve management success and to be more responsive to future conditions.”

Johnson, B. L. 1999. The role of adaptive management as an operational approach for resource management agencies. Conservation Ecology **3**(2): 8.


C
Develop a Monitoring Plan to Test Your Assumptions
B
Develop a Management Plan That Maximizes Results & Learning
A
Design an Explicit Model of Your System
E
Analyze Data & Communicate Results
D
Implement Management & Monitoring Plans
START
Clarify Group's Mission
ITERATE
Use Results to Adapt & Learn

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