DoD Environmental Planning and Conservation Webinar Series

Progress Update for the *Tuberolabium guamense* Species Action Plan

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Outline

- *Tuberolabium guamense*
- SAP Goals and Objectives
- Survey results
- Monitoring plan
- Benefits to DoD Mission

Tuberolabium guamense

- Small epiphytic orchid native to the Mariana Islands
- USFWS listed as threatened in 2015
- Little to no information on the species or any existing populations

Tuberolabium SAP

	Objectives	Status	Discussion
1	Establish a T. guamense inter-agency working group	Complete	Members from DoD, USFWS, DAWR, UOG
2	Conduct T. guamense surveys	In progress	Surveys in 5 locations in Guam and 4 in Rota resulted in more than 35,000 individuals recorded. Post-typhoon resurveys in one location in Guam have shown counts have nearly doubled.
3	Develop and implement a population, habitat, and threats monitoring plan	In progress	Plan being finalized, implementation uncertain

Tuberolabium SAP

PATH A: To be implemented if at least five highly resilient (to be determined based on population size and structure and threats observed) populations of *T. guamense* **ARE** discovered during the surveys on non-military lands :
4. **Evaluate potential status change for *T. guamense***
5. If appropriate, initiate draft rule proposing a change in status.

Tuberolabium SAP

PATH B: To be implemented if at least five highly resilient populations of *T. guamense* are **NOT** discovered during the surveys on non-military lands:	
6. **Conduct habitat restoration**:	Habitat restoration **may** consist of abating threats, building and maintaining ungulate fencing, removal of target invasive species, and outplanting of appropriate native plant species. Any habitat restoration needed will be determined by the working group.
7. **Establish and maintain a secured, *ex situ* (off-site) living collection of *T. guamense*** :	The living collection will include representation from all known populations and provide a commitment to maintain these collections into the foreseeable future.

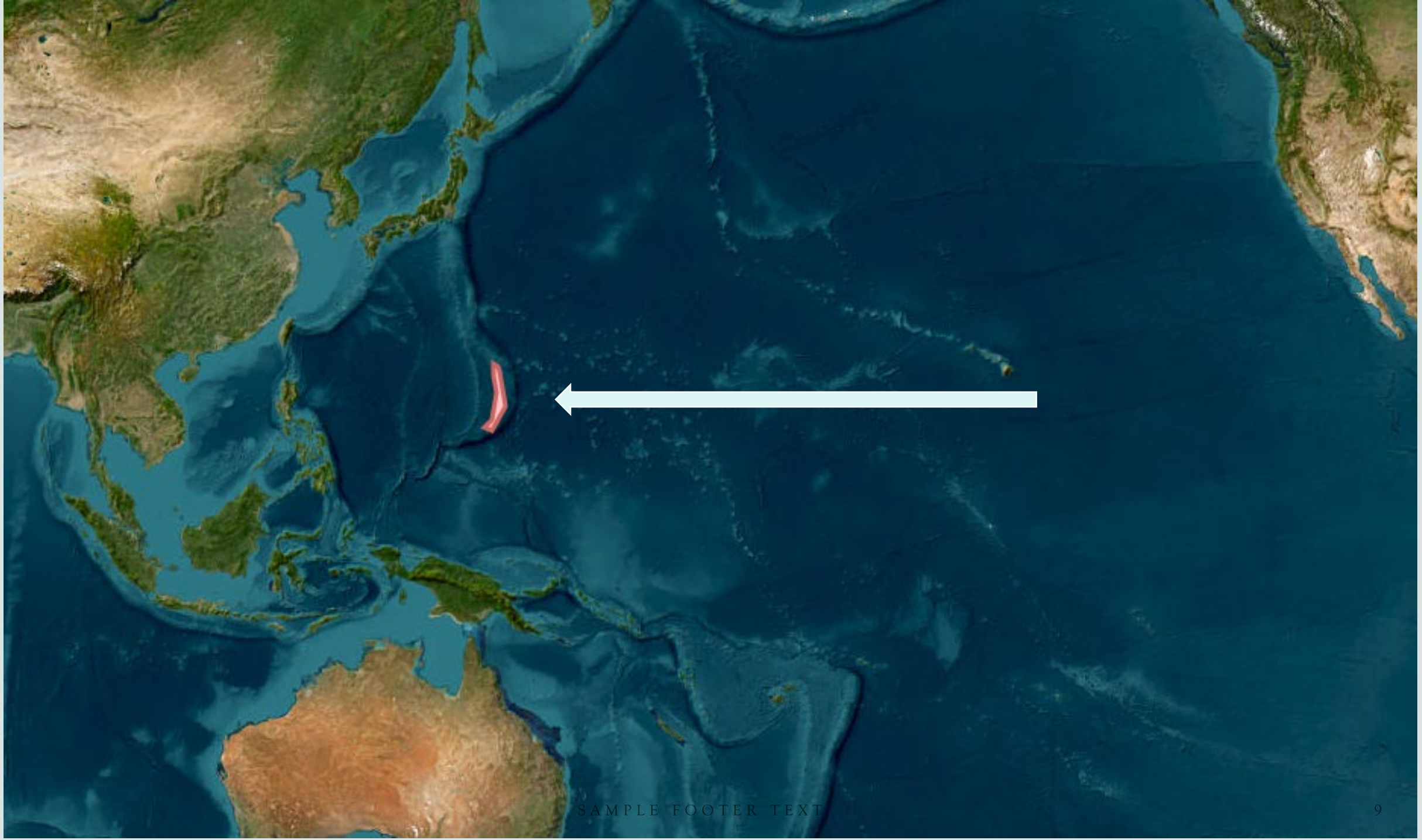
Draft USFWS Recovery Plan

- Criterion 1: **At least 10 populations** designated for delisting, with population sizes detailed in Table 9, are **stable, secure, and naturally reproducing for a minimum of 20 years** within **secure and viable habitats** to be considered for delisting. Species known from multiple islands within the archipelago, **have at least three populations on each of the historically occupied islands**, as long as suitable appropriate stock is available for reintroduction within the species' known range.
- Criterion 2: **Threats** to the species and the habitat of plant populations conserved to meet recovery Criterion 1 **are controlled**. For example, on islands with ungulates all of the populations designated for delisting are within fenced areas free of ungulates, with funding and agreements from conservation partners to maintain fences and ungulate free status of fenced areas. **Monitoring of the status and the threats to each population is ongoing**. **Population censuses and threat assessments are completed annually for at least 20 years prior to delisting**. Species-specific management actions (e.g., hand-pollination, propagation, and translocation) should no longer be necessary, but habitat management will be necessary over the long term.

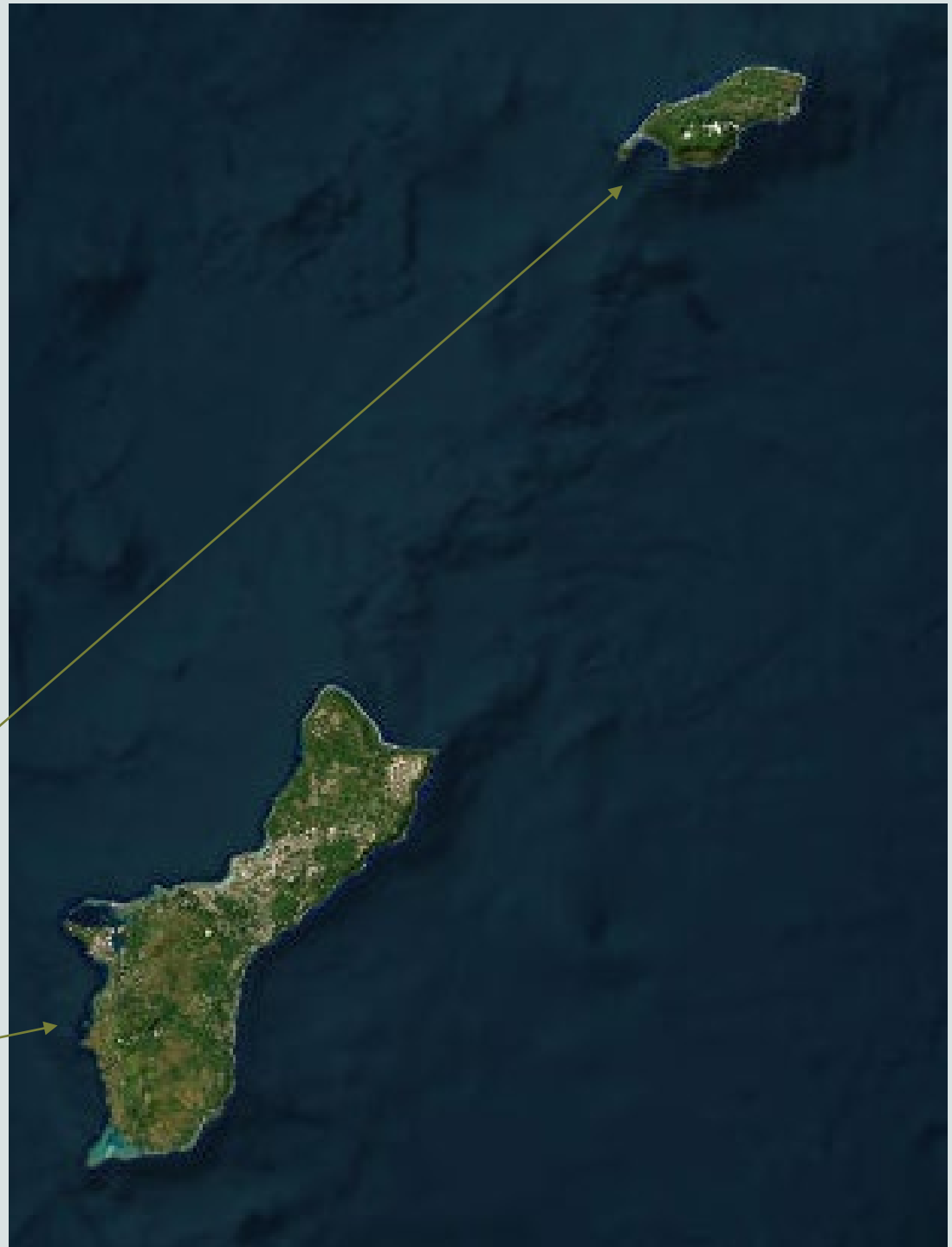
Draft USFWS Recovery Plan

Table 7. Minimum number of plant populations and the number of individuals per population needed to meet delisting Criterion 1.

Life Span	Population and Life History Characteristics	Minimum Number of Stable Populations	Reproducing Individuals/ Population	Species
Long	No specific characteristics known	10	200	*Eugenia bryanii*
		10	200	*Heritiera longipetiolata*
		10	200	*Maesa walkeri*
		10	200	*Psychotria malaspinae*
		10	200	*Tabernaemontana rotensis*
	Obligate Outcrosser	10	400	*Cycas micronesica*
Short	No specific characteristics known	10	500	*Bulbophyllum guamense*
		10	500	*Dendrobium guamense*
		10	500	*Hedyotis megalantha*
		10	500	*Nervilia jacksoniae*
		10	500	*Phyllanthus saffordii*
		10	500	*Solanum guamense*
		10	500	*Tuberolabium guamense*
	Obligate outcrosser	10	1000	*Tinospora homosepala*



Mariana Islands

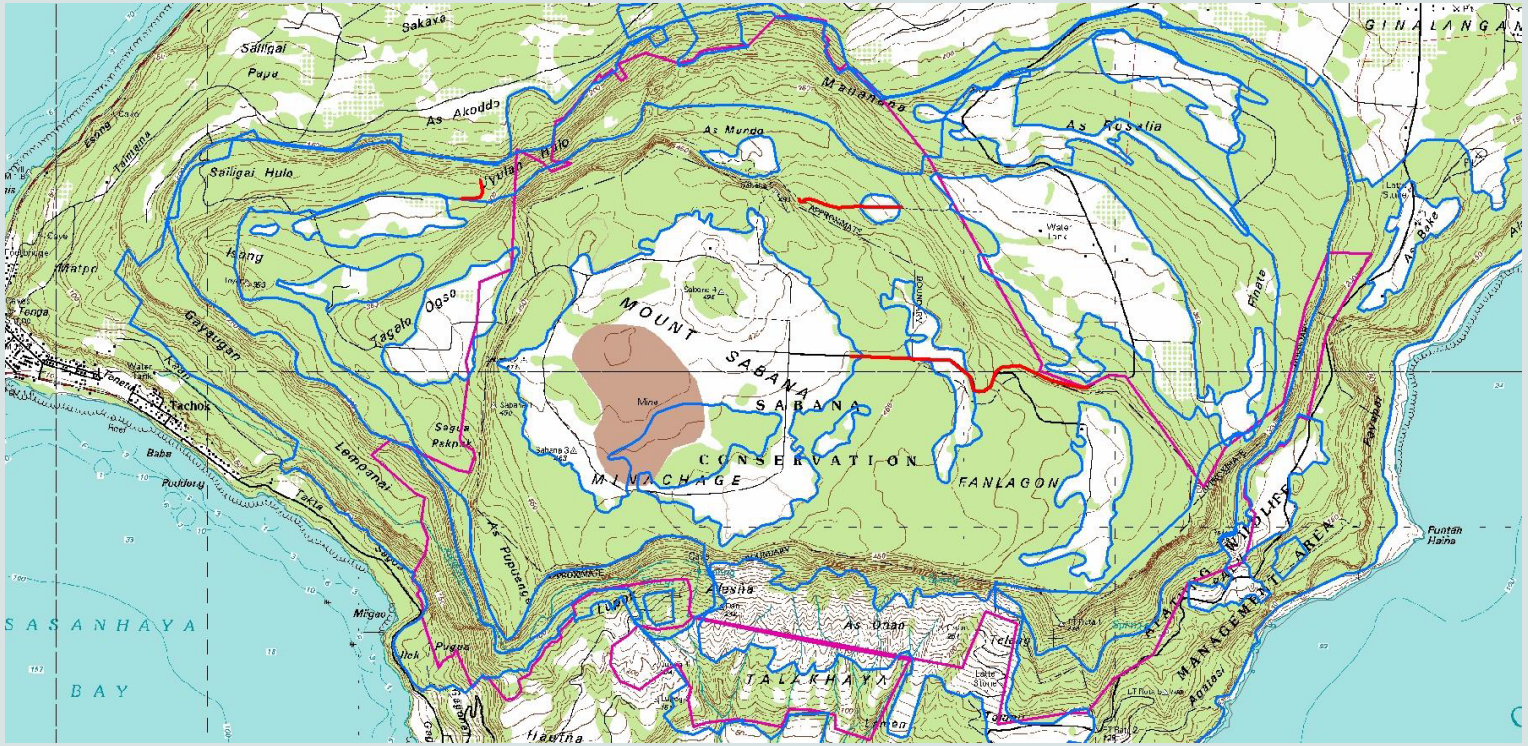


Rota

Guam

Recovery and Sustainment Partnership Focus

- Species Distribution outside of DoD lands
- At time of listing 1 known individual from Guam and ~200 in Rota



Initial Focal Areas

- Conservation Areas & Private lands with intact forest habitat

Populations recorded in non-military lands

Subpopulation	Immature	Mature	Total Count
Bolanos 1	5,630	8,225	13,855
Bolanos 2	390	248	638
Bolanos 3	2	3	5
Mati Pt	3,752	6,166	9,918
Yigo Raceway	353	3,221	3,574
Yigo near Mormon temple	58	81	139
Umatac	1,218	1,465	2,683
Rota	1,685	3,201	4,886

Populations recorded in military lands

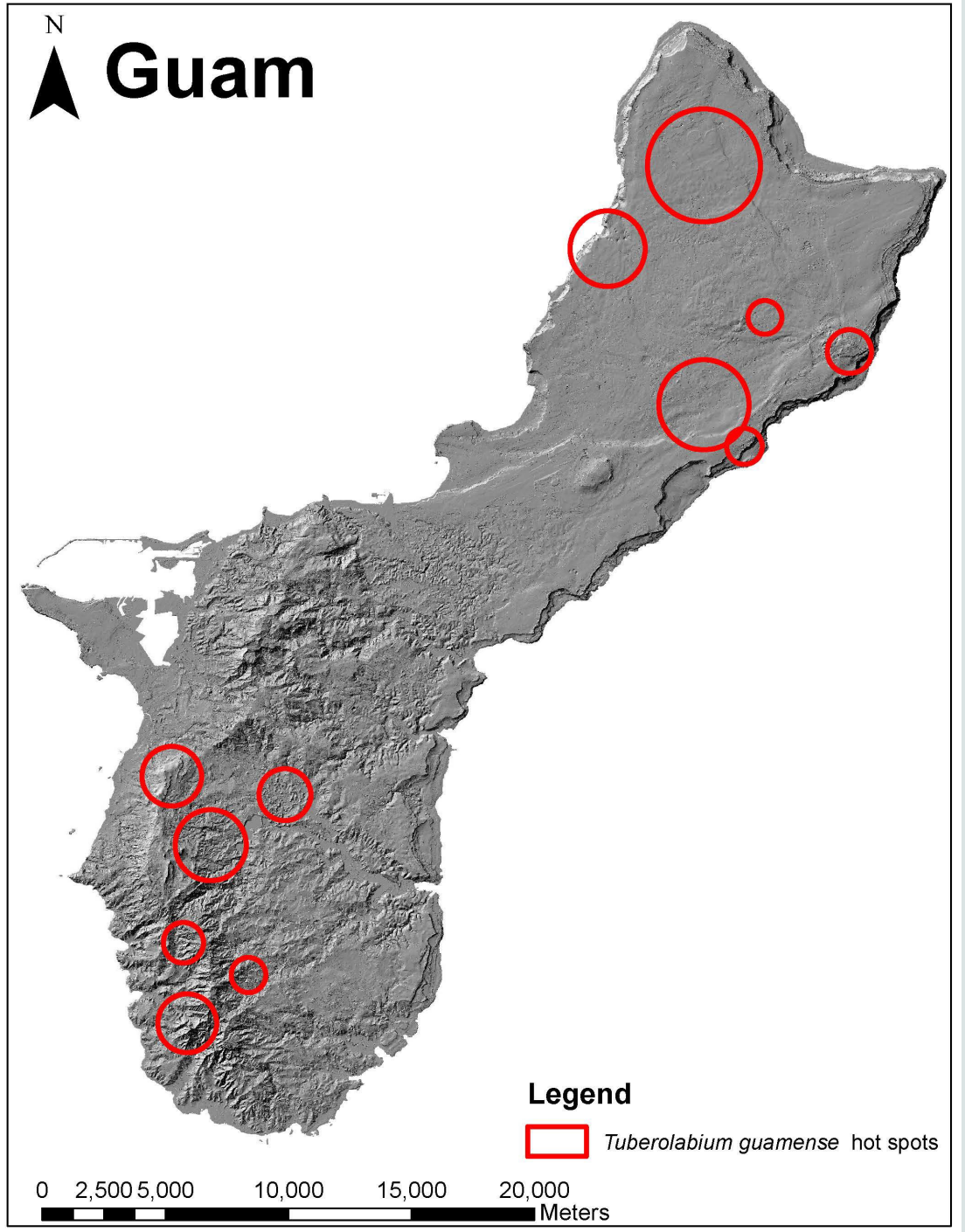
AAFB Area 1 near HMU	1,623	2,880	4,503
AAFB Area 2			3,963
Andy South 1			12
Andy South 2			39
AAFB NWF near HMU/MSA	8,734	15,644	24,378
Inside the HMU			280
MCBCB Forest Enhancement Area			13,474
Translocated (Forest Enhancement Area)	58	49	107
Translocated (MCBCB)	281	1,721	1,993

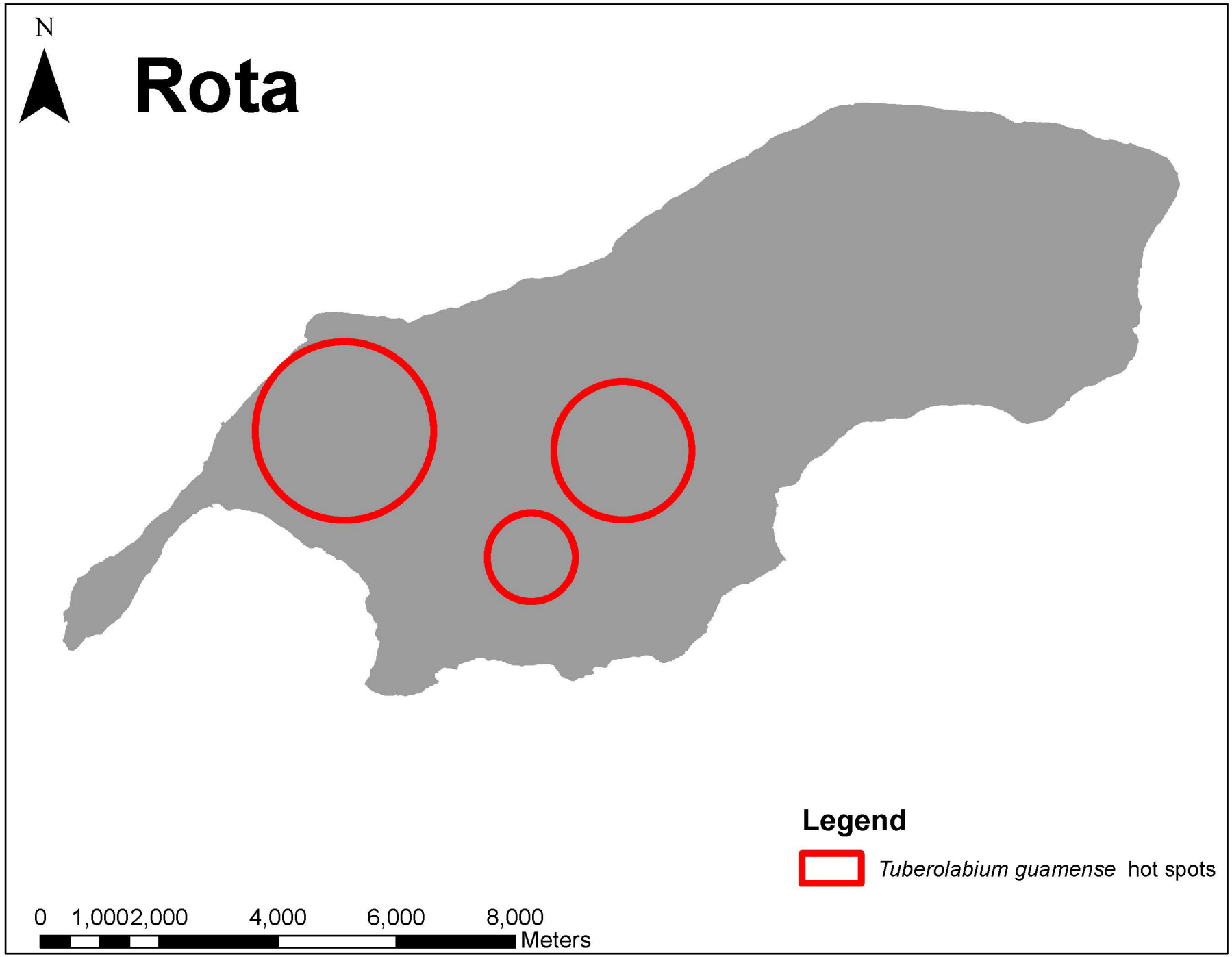
Populations recorded in military lands

MCBCB 1 (at translocation site)			1,257
MCBCB 2 (near Haputo)			163
MCBCB Translocated (near Haputo)			276
NAVMAG Area 1	116	220	336
NAVMAG Area 2	976	1,504	2,480
NAVMAG Area 3	1,849	3,611	5,460
NAVMAG Area 4	609	4,215	4,824

Survey Totals

Off-DoD Lands	35,698
DoD Lands	63,545
Total	**99,243**




N
Rota
Legend
Tuberolabium guamense hot spots
0 1,0002,000 4,000 6,000 8,000
Meters

What else did we learn?

- Tuberolabium is very adaptive
- Grows on a wide assortment of host trees (native and non-native)
- Recorded at heights ranging from just above ground level to about 10 meters with most occurring around 2-4 meters
- Reproduction and recruitment occur in all locations surveyed
- Elevation or exposure to salt spray may be a factor

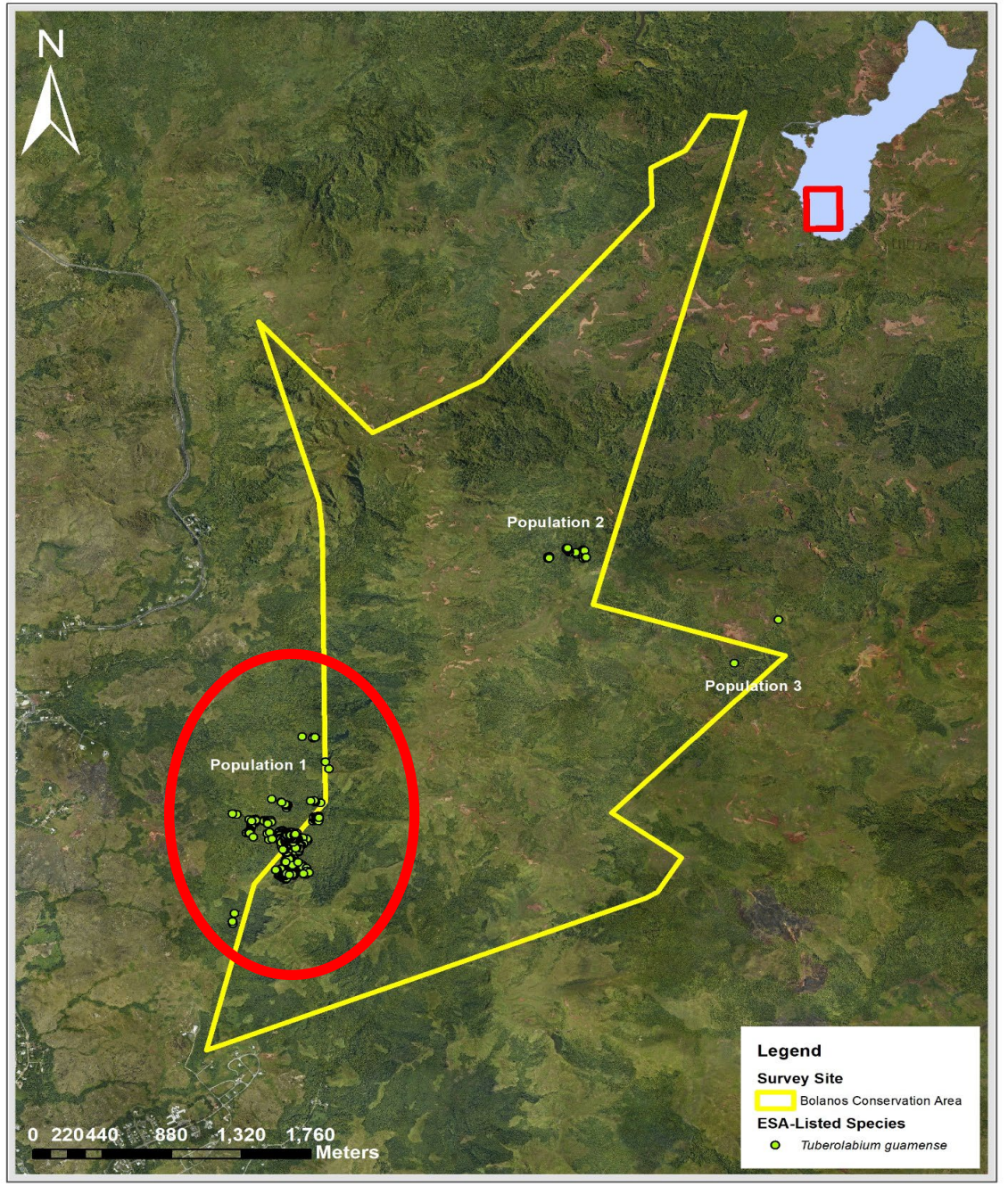
Post-typhoon assessments

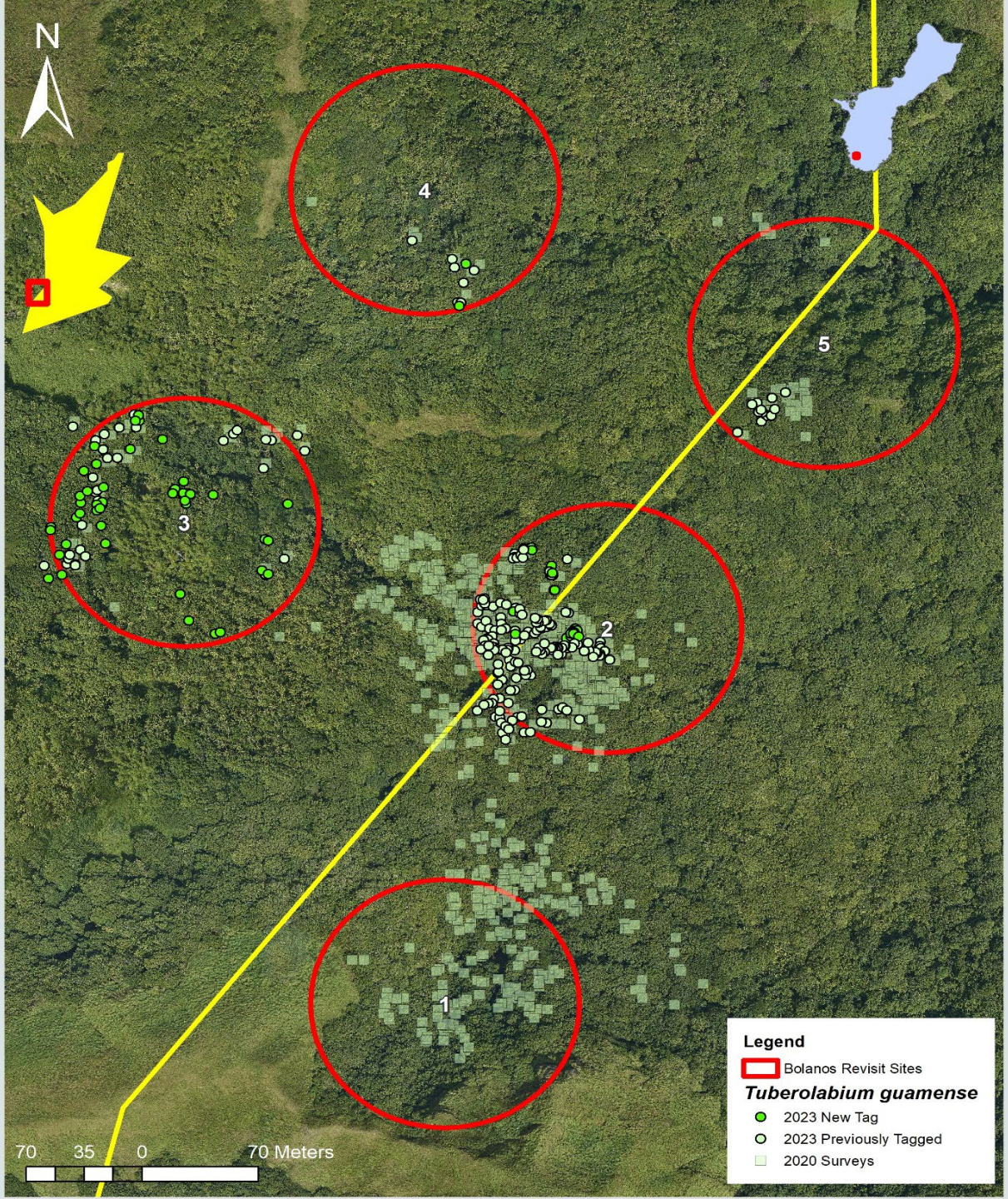
- Typhoon Mawar passed over northern Guam in May 2023
- Damaging winds in both Guam and Rota
- Bolanos reassessed in late 2023
- Rota surveys occurred post-typhoon

    -Even with many wind-thrown trees, numbers still stable and high

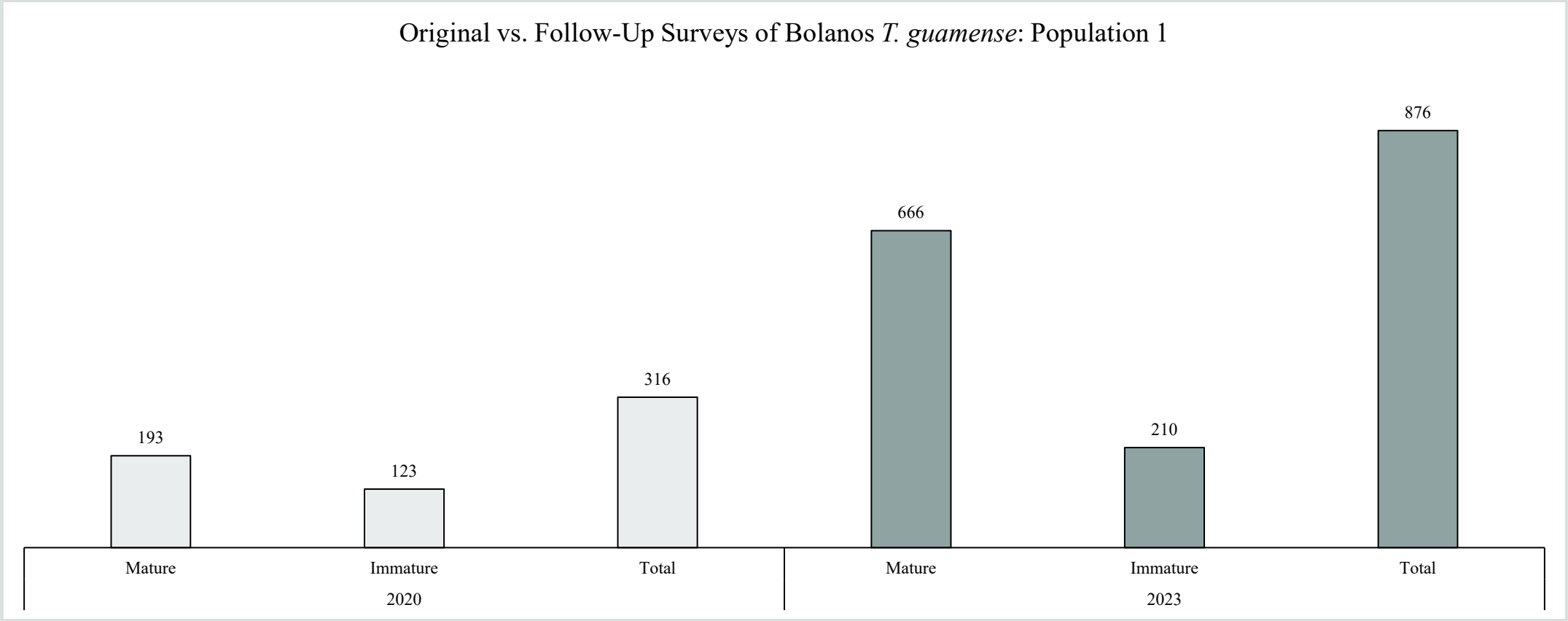
Bolanos reassessment post-typhoon

- Originally surveyed in 2019-2020
- Follow up in late 2023 to examine any effects from typhoon
- Created plots in population 1 and compared original results to 2023 results

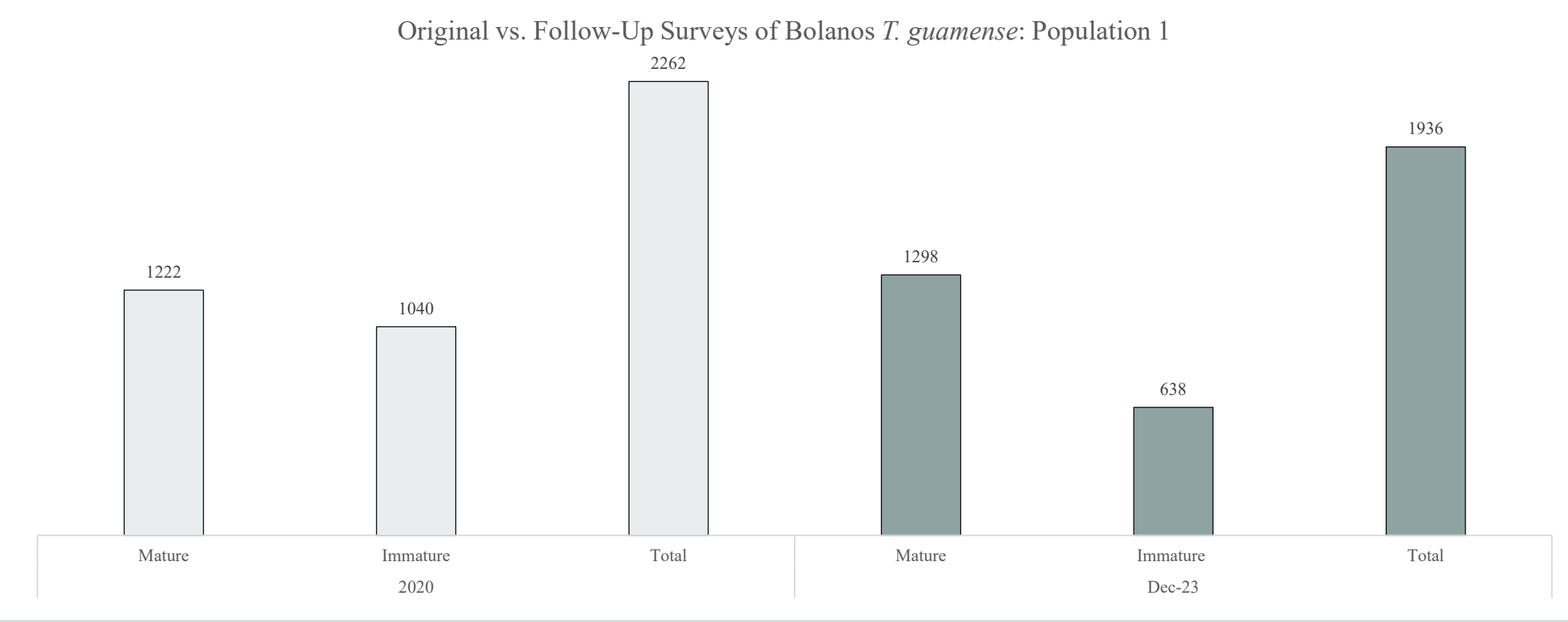



N
4
5
3
2
1
Legend
Bolanos Revisit Sites
Tuberolabium guamense
2023 New Tag
2023 Previously Tagged
2020 Surveys
70 35 0 70 Meters

Population 1 - Plots 3 &4



Population 1 – Plots 2 & 5 (incomplete sample)



Post-typhoon key takeaways

- Numbers about doubled in 4 years, even after typhoon
- Recruitment occurred on previously unoccupied host trees
- Some previously occupied host trees no longer had living orchids
- Short life cycle
- Location of the population can shift in a short period of time
- Resilient to strong winds

Defining a Resilient Population

- TUGU Working group
- Set criteria for determining a population unit
- Considered biological and abiotic factors
- Considered USFWS listing criteria
- Examined all threats
- Evaluated each known population

What is a population unit for Tuberolabium?

- Tuberolabium is an epiphytic orchid found on trees
- Seeds are very small and light
- Wind can spread seed far
- Pollinator is unknown
- A population unit was defined as a group of orchids separated by at least 1000 meters

Biological Factors

- Size (number of individuals)
- presence of pollinator mechanism and successful pollination
- seed dispersal
- ability to compete with other vegetation for space to grow
- protection from herbivory or lack of herbivorous threats
- suitable hosts for recruitment

Abiotic Factors

- sufficient space in suitable habitat to allow for expansion
- total area a subpopulation occupies
- fire threats
- weather threats (drought, typhoon)
- likelihood of human development.

Threats

- Destruction and modification of habitat by feral ungulates
- Rats
- Non-native plants
- Development, military training, and urbanization
- Fire
- Typhoons
- Predation or herbivory

USFWS Listing Criteria

Five factors when listing a species under the ESA.

1) Present or threatened destruction, modification, or curtailment of its habitat or range;

2) overutilization of the species for commercial, recreational, scientific, or educational purposes;

3) disease or predation;

4) inadequacy of existing regulatory mechanisms;

5) other or natural manmade factors affecting its continued resistance.

Essential Actions to be completed for both Path A and Path B

- ***T. guamense* working group to determine whether Path A or Path B will be followed.**
- Complete a draft recovery plan (Complete).
- Finalize the *T. guamense* 5 Year Status Review. Raw data received through June 2020 has informed the 5 year review (completed October 2020).
- Identify populations to protect from development, if any, and actions to secure protection of these populations from development.
- Identify locations for *T. guamense* habitat management and protection and determine fencing and restoration needs.
- Develop a *T. guamense* management plan and agreement to monitor, manage, and protect these management units for *T. guamense* into the foreseeable future, including a method to track progress and reassess conservation achievements towards recovery.
- Continue to monitor *T. guamense* populations and habitats, quantify impacts of invasive species, and implement threat abatement.
- Federal Register publication of draft recovery plan.

Challenges

- **Capacity and availability** of implementation partners for on the ground conservation. Awarded funds often extended at no cost
- **Private landowner permission** difficult due to uncertainty of property owners or inability to contact
- **Long-term funding of management proposed in monitoring plan –** who will fund? Who will conduct monitoring?
- **High numbers of orchids discovered** – most rare plant monitoring is designed for plants that are much less common. Monitoring efforts for nearly 100k individuals may be costly/require many work hours
- **Propagation difficult –** propagation could be used to offset impacted orchids but a methodology has not been proven

Looking Forward

- Determine if going with Path A or Path B
- Decide who is responsible for funding actions in the monitoring plan
- Increase partner engagement to coordinate other efforts for collaborative synergies
- Explore the feasibility of de-listing the species at a pace faster than what is suggested in the USFWS recovery plan

Questions?

Acknowledgements

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