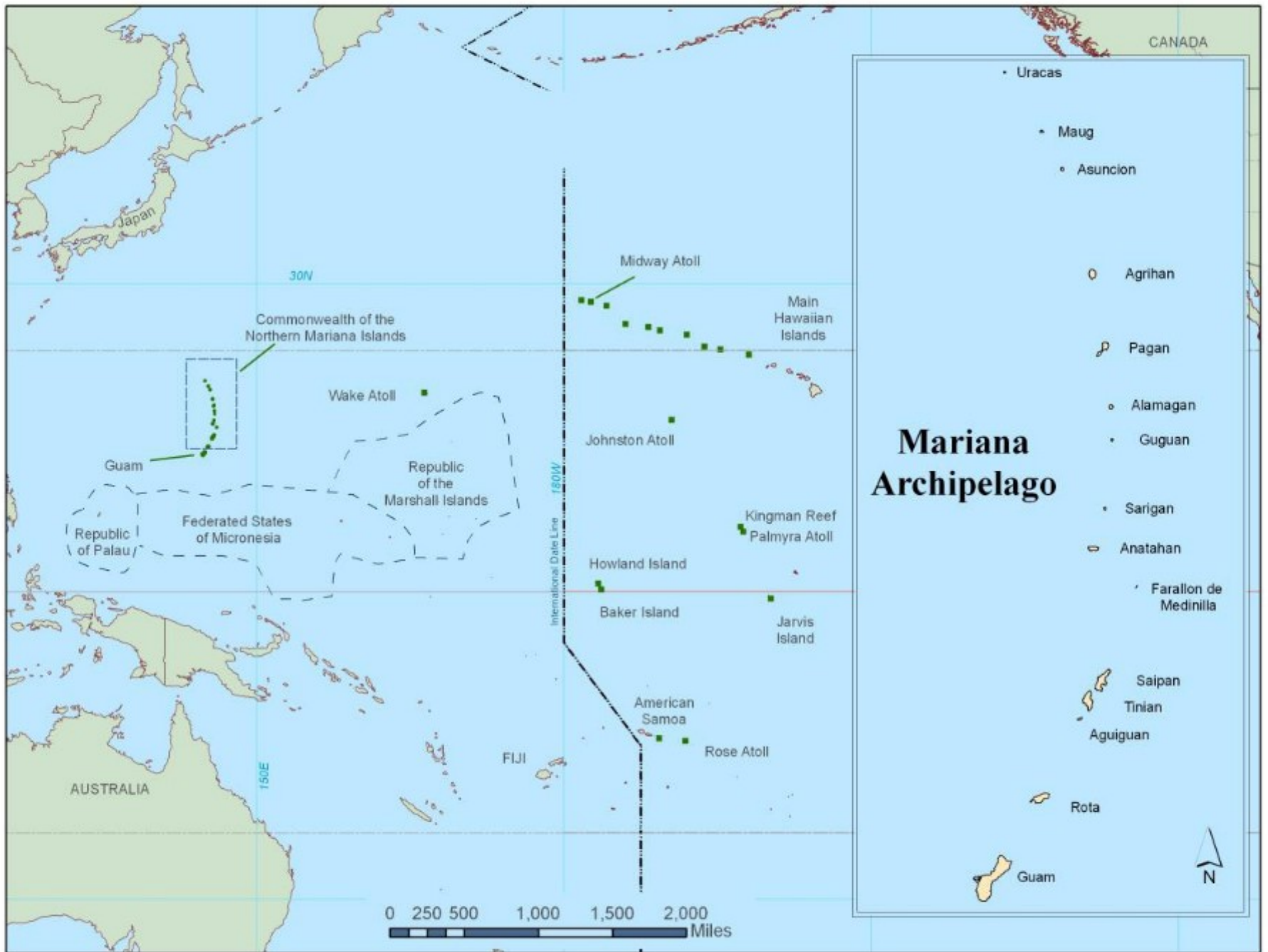


Management of Rare and Endemic Species within a Dynamic Natural Disturbance Regime and among Anthropogenic Threats in the Commonwealth of the Northern Mariana Islands

By Jim Keany – Environmental Science Associates
and
Lainie Zarones - CNMI Department of Lands and
Natural Resources





Mariana Archipelago

- Uracas
- Maug
- Asuncion
- Agrihan
- ⌘ Pagan
- Alamagan
- Guguan
- Sarigan
- Anatahan
- Farallon de Medinilla
- Saipan
- Tinian
- Aguiguan
- Rota
- Guam

Commonwealth of the Northern Mariana Islands

- 14 Islands
- 473 square kilometers
- Population around 54,000
- Vast majority of population on Saipan, Tinian, Rota



Saipan – population 48,000



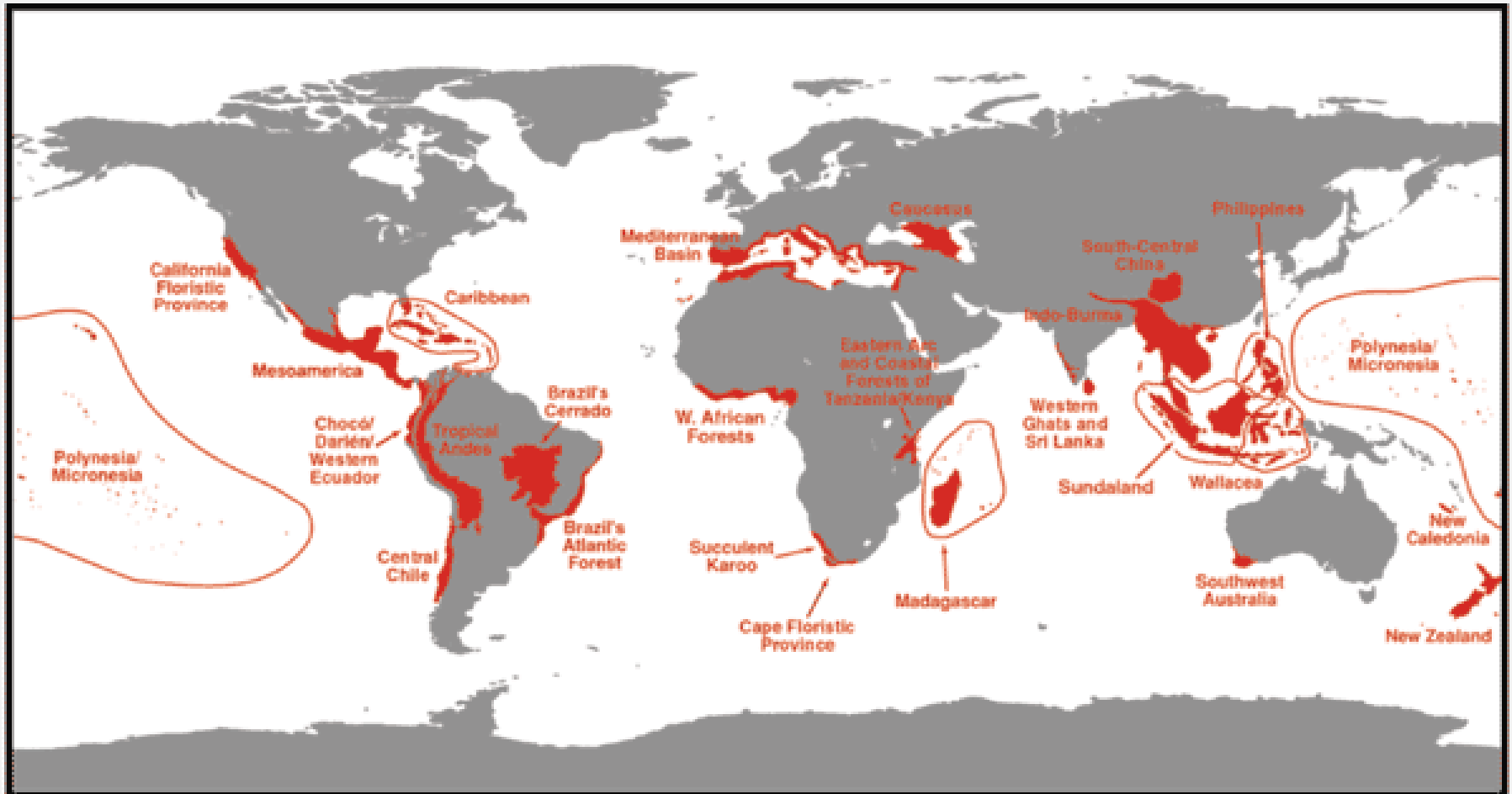
Alamagan – population 1

NORTHERN MARIANA ISLANDS



Micronesia is a Biodiversity hotspot

- area with a high concentration of endemic species



Tinian Island

- Intense WWII Battles
- Population - 3,100
- 101 km²
- Agriculture/cattle grazing/tourism



Pagan Island

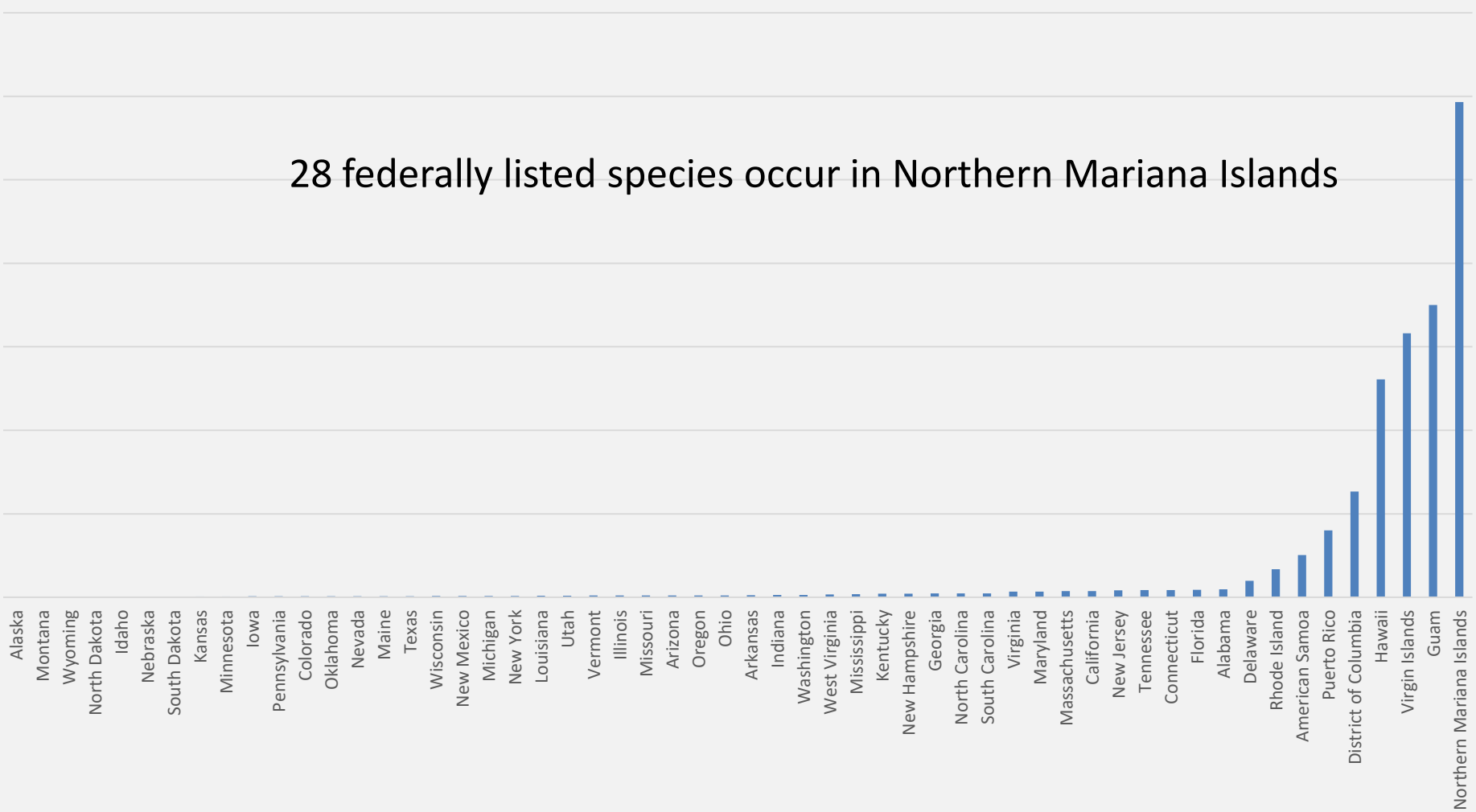
- Volcanic eruption 1982
- Population – 20
- 48 km²
- Limited agriculture/livestock



NMI has highest density of listed species of any US state or territory

Listed species/1000 km²

28 federally listed species occur in Northern Mariana Islands



Mariana Skink (*Emoia slevini*)



Photo by Tigran Tadevosyan

- Federal Status: Endangered
- IUCN – Critically Endangered
- Alamagan, Asuncion, Guguan, Pagan, and Sarigan. Status unknown on other islands.
- Population - Unknown

Mariana Fruit Bat

(*Pteropus marianus marianus*)



- Extant on Guam, Aguiguan, Rota, Saipan, Northern Islands
- Federal Status: Threatened
- IUCN Status: Endangered
- Population: 5,400
- Culturally important food

Microneasian Megapode

(Megapodius laperouse laperouse)



- On most islands
- Federal Status: Endangered
- IUCN Status: Endangered
- Population: 10,800

Bridled White-eye

(*Zosterops conspicillatus saypani*)



Photo by Pacific Bird Conservation Group

- IUCN Status: Endangered
- Saipan, Tinian, Aguiguan; introduced to Sarigan and Guguan.
- Population > 1 Million

Tinian Monarch

(*Monarcha tatatsukasae*)



- IUCN Status: Vulnerable
- Endemic to Tinian, introduced to Guguan
- Population – 91,000

Disturbance Regime

Typhoons



- Past 15 years – less frequent but stronger storms than previous 20 years
- Two severe storms in 2015 in Marianas – Dolphin and Soudelor
- Habitat alteration

Typhoon Soudelor, Saipan, August 2015

Typhoons

Habitat Alteration

Nesting Delay or
Postponement

Predation Increase

Mortality of eggs,
nestlings, and fledglings

Limited food supply

Increased Inter-
and Intra-species
competition

Volcanic Activity



Anahatan 2003



Pagan 1981

Invasive Species

Brown Tree Snake



- Present on Guam – has devastated avian populations
- Sightings on Saipan, Tinian, and Rota

Feral Ungulates- Goats, Pigs, Cows



- Eradicated from Sarigan and Anatahan
- Substantial populations on Pagan, Alamagan, Agrihan

Sarigan: 1997 versus 2015 (post-ungulate removal)

Top row: 1997, bottom row: 2015, same photo points



Invasive species of concern – CNMI DLNR

Land Plants

- *Coccoloba grandis* - Ivy gourd
- *Chromolaena odorata*
- *Spathodea campanolata* - African Tulip
- *Lantana camara*
- *Mimosa invisa* - Sensitive Plant

Aquatic Vertebrates

- *Channa striata* - Snakehead
- *Ctenopharyngodon idella* Grass Carp
- *Anguilla japonica* - River Eel
- *Eriocheir sinensis* - Mitten Crab
- *Oreochromis mossambicus* - Tilapia

Land Vertebrates

- *Boiga irregularis* - Brown Treesnake
- *Eleutherodactylus coqui* Coqui Frog
- *Eleutherodactylus planirostris* - Greenhouse Frog
- *Chrysemys scripta elegans* - Red eared slider
- *Anolis sagrei* - brown anole

Land invertebrates

- *Solenopsis invicta* - Red imported fire ant
- *Wasmannia auropunctata* - little fire ant
- *Veronicella cubensis* - Cuban Slug
- *Aulacaspis yasumatsui* - Cicad Scale

Military Training

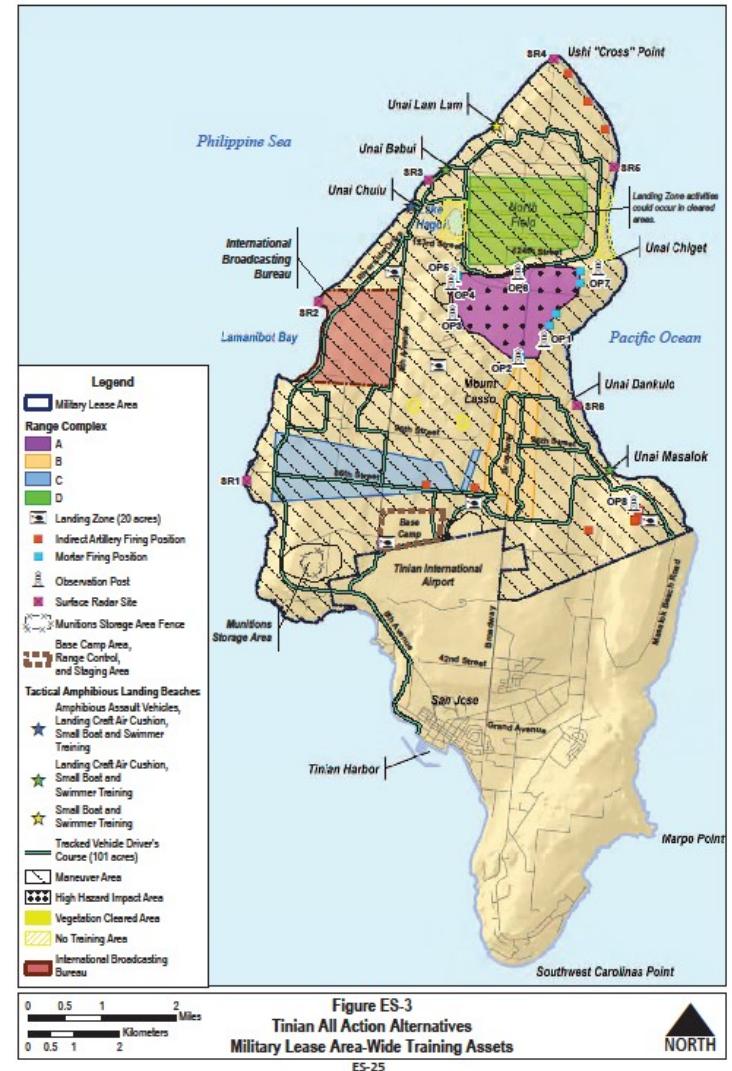


- Farallon de Medinilla (FDM)
- 50 year lease for bombing

Newly Proposed Military Training

Tinianian Island

- Land clearing
- Intense land exercises
- Live fire training
- Variety of munitions



Tinian Island

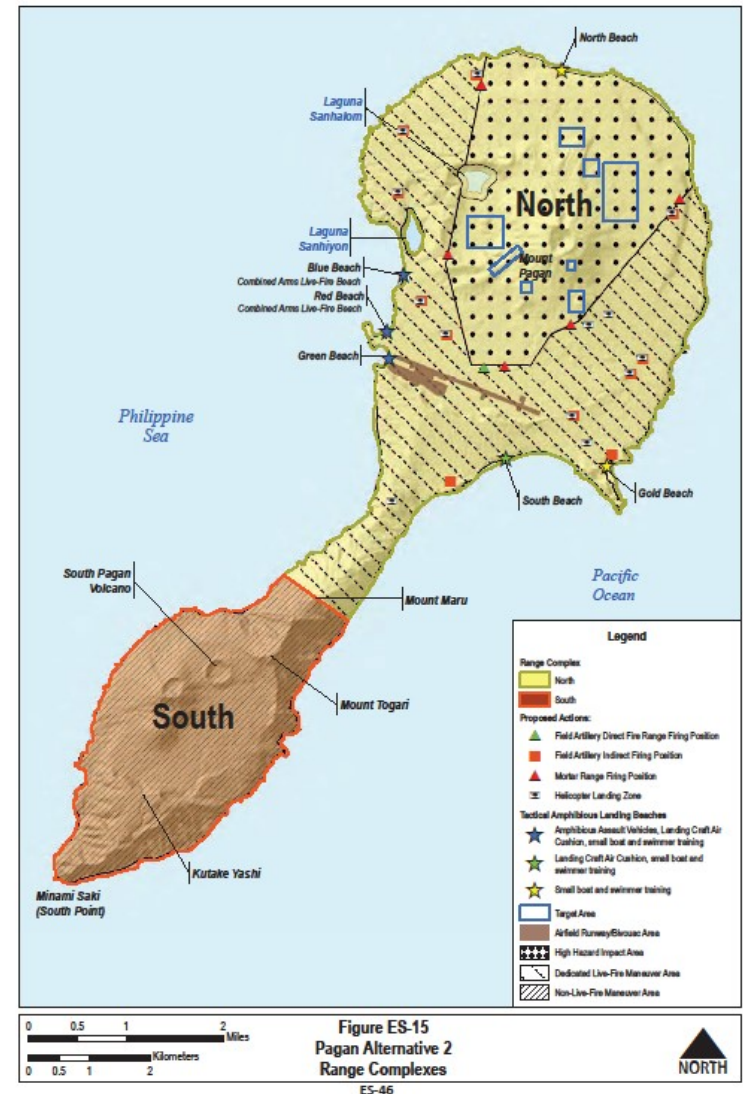
Munition Quantities/Year

Field artillery, mortar, rocket, grenade	114,681
Small arms – up to .50 cal	4,924,643
Air delivered munitions – up to 1,000 pound bombs	176,600

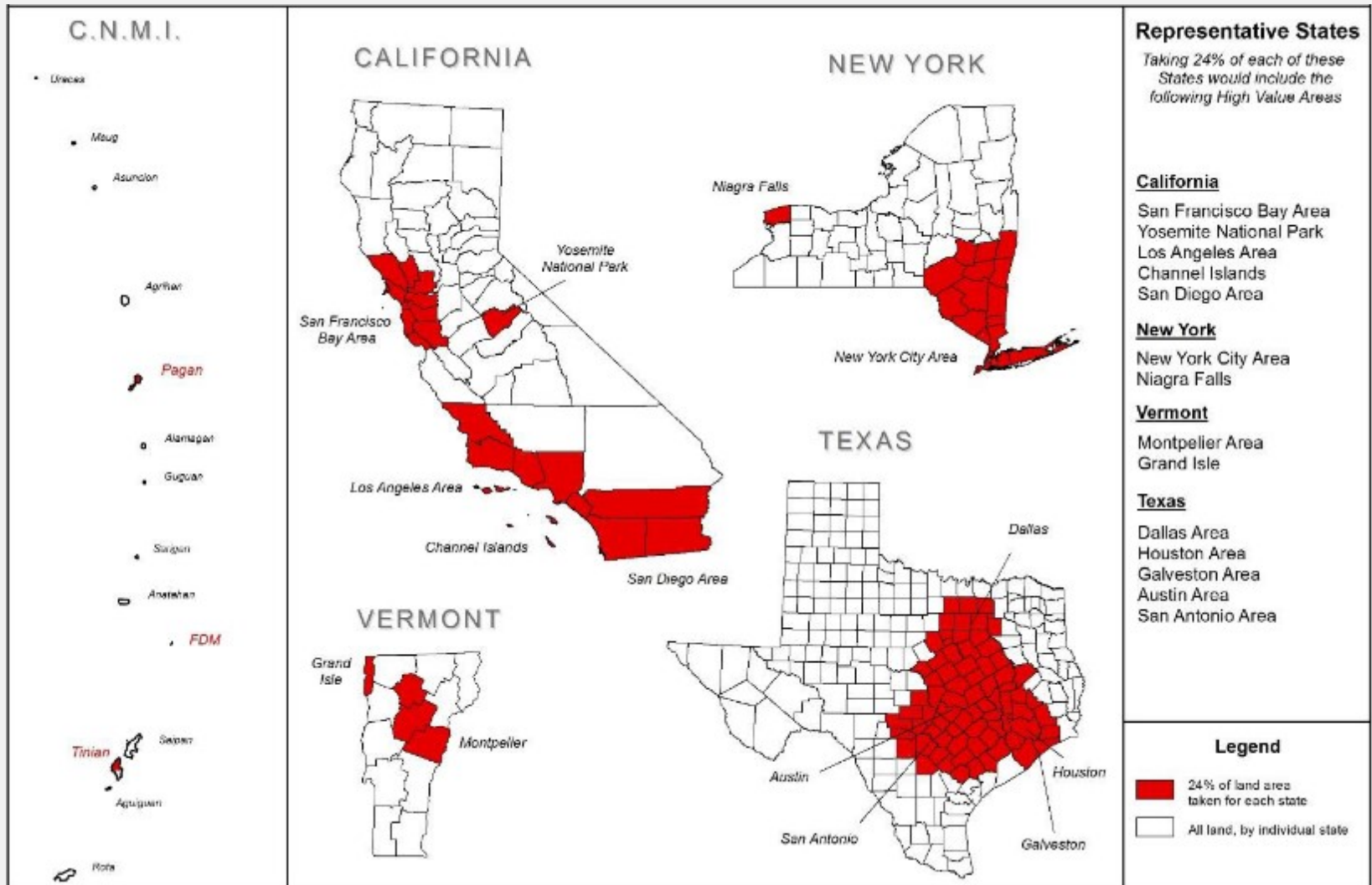
Newly Proposed Military Training

Pagan Island

- Northern island bombing range
- Ship-to-shore artillery
- Land force maneuvers



New Military Proposal Control of 24% of the CNMI



CNMI Management Efforts

- Wildlife Action Plan for the CNMI 2015-2025
- Wildlife Restoration Program
- State Wildlife Grant Program
- Endangered Species Program
- Sea Turtle Program



CNMI Management Efforts

- Marianas Avifauna Conservation Plan

Cooperators:

- Pacific Bird Conservation Group
- The Association of Zoos and Aquariums

MARIANAS AVIFAUNA CONSERVATION (MAC) PLAN

Long-term Conservation Plan for the Native Forest Birds of the Commonwealth of the Northern Mariana Islands



**ASSOCIATION
OF ZOOS &
AQUARIUMS**

A Joint Endeavor of:
The Commonwealth of the Northern Mariana Islands' Division of Fish and Wildlife,
The United States Fish and Wildlife Service,
Pacific Bird Conservation,
and
The Association of Zoos and Aquariums

Produced by:
The MAC Working Group

May 2014

CNMI Management Efforts

- Invasive Species Control
- Public outreach
- Control of feral ungulates/cats
- Translocation of avifauna to other islands (i.e. Tinian monarch, Rufous fantail, Bridled white-eye)

Federally Listed Species with USFWS Recovery Plans

- Mariana Crow
- Rota White-eye
- Nightingale Reed-Warbler
- Micronesian Megapode
- Mariana Common Moorhen
- Mariana Swiftlet
- Mariana Fruit Bat
- Green Sea Turtle
- *Nesogenes rotensis*
- *Serianthes nelsonii*
- *Osmoxylon mariannense*



Federally listed species in CNMI but no recovery plan

- Sheath-tailed bat
- Mariana Skink
- Mariana Eight-spot Butterfly
- Mariana Wandering Butterfly
- Rota Blue Damselfly
- Humped tree snail
- Langford's tree snail
- Fragile tree snail
- *Bulbophyllum guamense*
- *Cycas micronesica*
- *Dendrobium guamense*
- *Heritiera longipetiolata*
- *Maesa walkeri*
- *Nervilia jacksoniae*
- *Solanum guamense*
- *Tabernaemontana rotensis*
- *Tuberolabium guamense*

Translocation Program

Successful translocations of:

- Bridled white-eye
- Golden white-eye
- Mariana fruit dove
- Rufous fantail
- Tinian monarch

Photo by Michael Lusk



CNMI Management Efforts

- Forest enhancement
- Deter poaching (fanihi) and public education
- Population monitoring
- Invasive Species Control
- Field research/genetic research
- Oppose increased military training

PRUTEHI I FANIHI!

Yangin ti para hita... pues para I famagu' on-ta!



Manehsina gihosa,
diseña pumeska
kontra h hit.

ÁPAS AGRADISIMENTO

I ufsiales i Federât, i CNMI yan Guâhân-siha, man dadaña gi che'cho' inenbistiga gi i aktibidât pumeskan fanihi kontra i lai. Guaha inifresin âpas (ginen i gubetnumenton i Federât) anai siña ma apâsi hão \$1,000 put infotmasion nu' i siña muna' fan ma gacha' yan manmaarek' la ayu-siha na tâotão i manresponsâpble nu esti-siha na aksion. Yanggin guaha infotmasion-mu put aksion pumeska kontra i lai osino aktibidât komo i bentan fanihi, pot fabot âgang i Ufsiât i Lai gi ufsinan i Setbision Guihan yan Gá'ga' Machâlek-siha para i Ustâdos Unidos gi (670) 233-0938 (CNMI) / (671) 647-6067 (Guâhân). Siña ha' lok'kue un âgang i ufsinan i Abugão i Ustâdos Unidos (Saipan) gi (670) 236-2980.

Hâfa siña un chogue?

- Put fabot, munga ma punu' pat makânu i fanihi!
- Ayuda prumutehi i chenchon-niha. Fan na' i notisia gi aturidât-siha put aktibidât ni' sina umafekta i ga'ga gi sagan-niha.
- Boluntaru gi ahensian i guinahan naturât para un fan ayuda gi che'cho' prunitehen i fanihi.



Outreach

People of the Northern Mariana
Islands



Thank you

CNMI Department of Lands and Natural Resources: Division of Fish and Wildlife

- <http://cnmi-dfw.com/>

CNMI Response to Proposed Military Training

- <http://www.cnmieis.org/>

