



United States
Department of
Agriculture

Forest
Service

Overview of the Institute of Pacific Islands Forestry (IPIF)

Susan Cordell

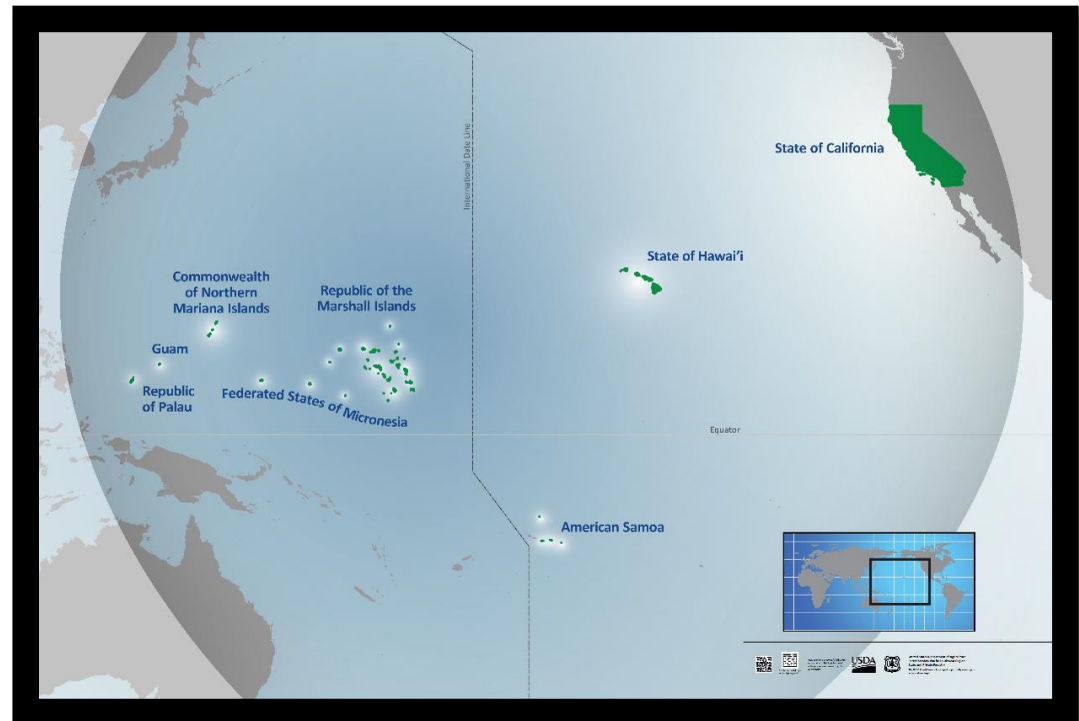
*Western Governors' Association webinar,
April 17th, 2019*



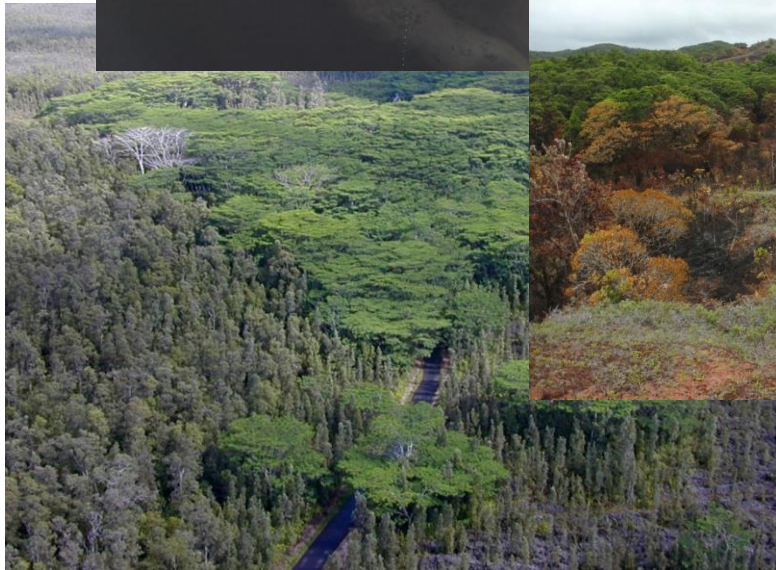
Place based, All Lands, All Hands, One FS: Coordinated R5 IPIF WO programs

Research and
technical assistance
in:

- an area
~Continental USA
- about 130
inhabited islands
- >15 native
languages



The resources at risk in the Pacific underscore the need for increased technical assistance and research in environmental management and restoration



How we work in Hawaii and the US Affiliated Pacific Islands

- Understand the Complexities
 - Western Pacific Islands are not Hawaii
 - Provisional governments and territories
 - Fewer forestry resources
 - Military influences
 - Other governments
 - Climate Change
- Recognize Social and Cultural Ties
 - Hawaiian History
 - Ancestral ties to land and ocean
 - Ahupua'a and Agroforestry
- Live Compact
 - Raindrop to faucet
 - Ridge top to Reef
 - Mauka to Makai



IPIF Program

Research Themes

1. Science to Understand and Address Landscape Change
2. Science Driven Strategies to Promote Diverse and Productive Terrestrial and Aquatic Systems
3. Island Biocultural Science and Stewardship



Theme 1 Landscape Change - Examples of current research

- Invasive plant pathogens such as Rapid 'Ōhi'a Death.
- Discovery and evaluation of new biocontrol agents for ecosystem altering invasive plants.
- Estimating future carbon storage and carbon fluxes in ecosystems of Hawai'i, providing robust baseline estimates.
- Predicting the effects of climate change and plant invasion on watershed function.
- Field studies on threatened and endangered plant and animal species in Hawai'i.



Theme 2 - Strategies to Promote Resilient Ecosystems - Examples of current research

- Using a “hybrid” approach for restoration.
- Scent-dogs for the early detection of pathogens.
- Decision support tools for natural resource management.
- Development of site specific restoration strategies for degraded ecosystems.
- Future climate models to incorporate climate change into restoration strategies.
- Landscape genomics and other indicators of resistance to identify suitable varieties of native species for a changing climate.



Theme 3 – Biocultural Science and Stewardship - Examples of current research

- Geospatial mapping and social network analyses of community based stewardship of natural resources in Hawai'i.
- Collaborative, community based approaches to examining the influence of saltwater intrusion into coastal wetland agro-ecosystems in Micronesia.
- Exploring the human dimensions of large scale biological control in Hawai'i.
- Utilizing a hālau (Hawaiian word for 'school' or 'academy') approach to understand how conservation biology can be integrated with native Hawaiian traditional perspectives to enhance the effectiveness of resource management.



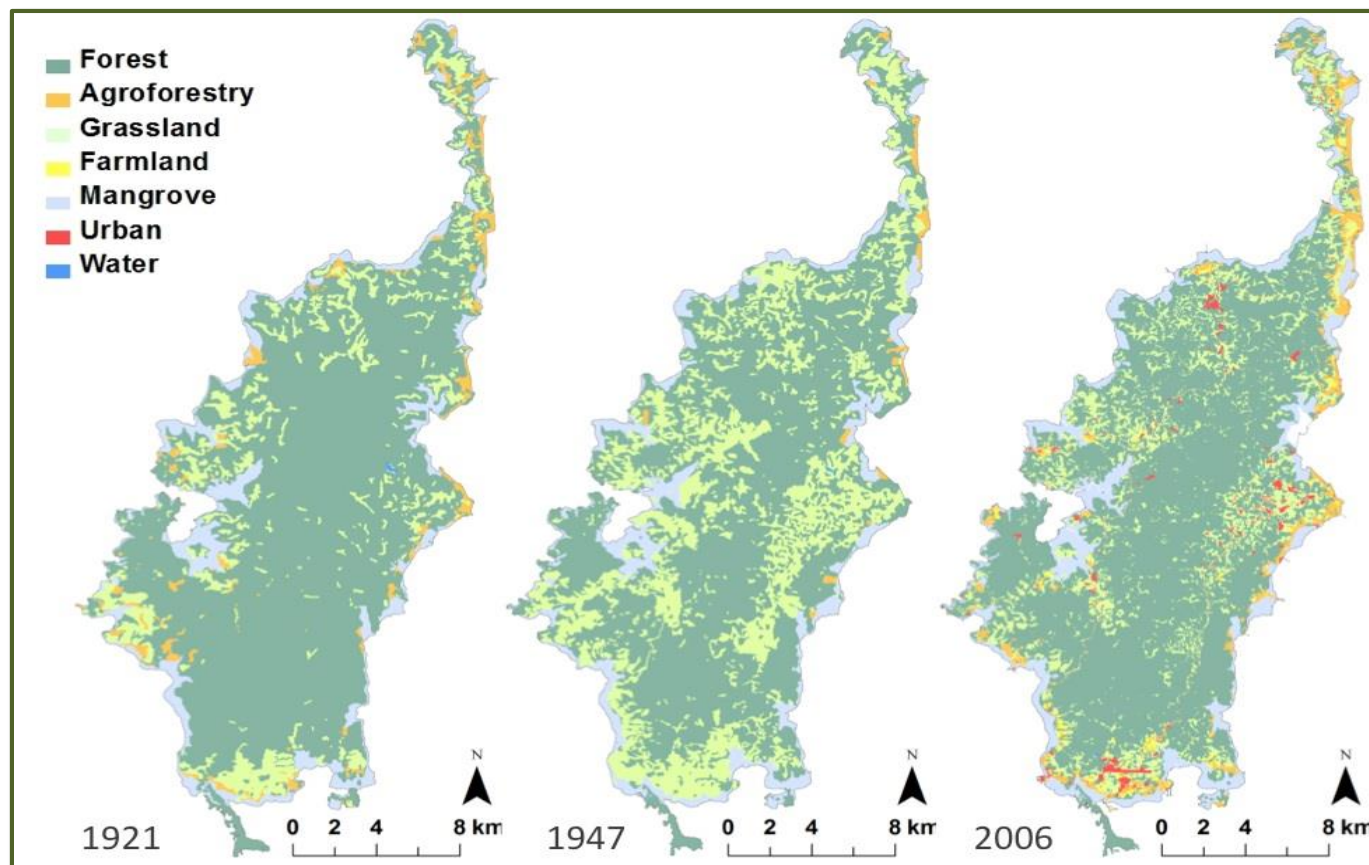
Major Topic Areas in the Western Pacific

1. Dynamics of Pacific Island Resources
2. Climate Change
3. Invasive Species
4. Fire
5. Forest recovery



1. Dynamics of Pacific Island Resources

- Many cycles of forest contraction and expansion over the centuries
- Possibly greatest expansion of savanna during Japanese occupation prior to WWII
- Forest recovery fastest next to forest edge and in some abandoned agricultural areas



2. Climate Change

Issue: Mangrove forests and their ecological services are the most at-risk ecosystems to sea level rise impacts

Need: monitoring for local climate change predictions and identifying/prioritizing mangroves for restoration or conservation

Approach: determine how fast forest floors of mangroves are rising or falling compared to current rate of sea level rise

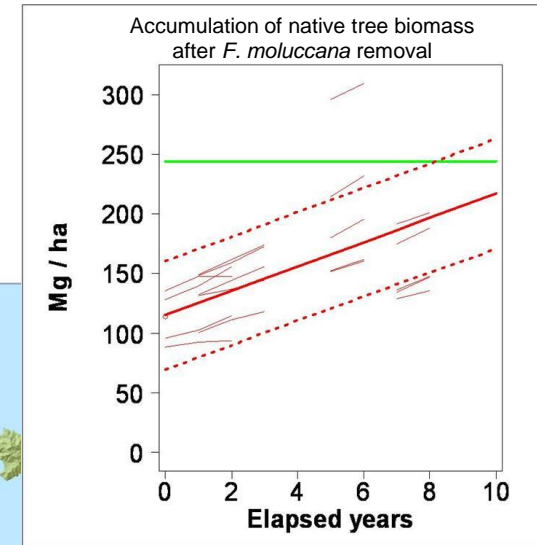
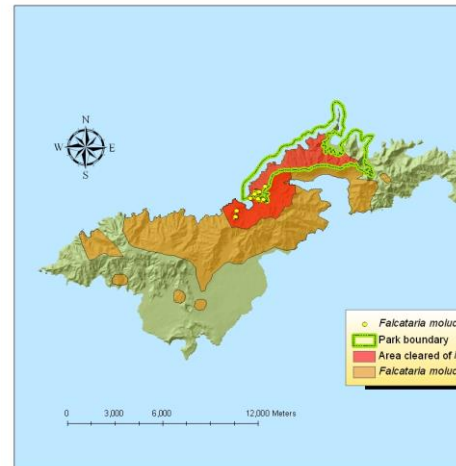


3. Invasive species

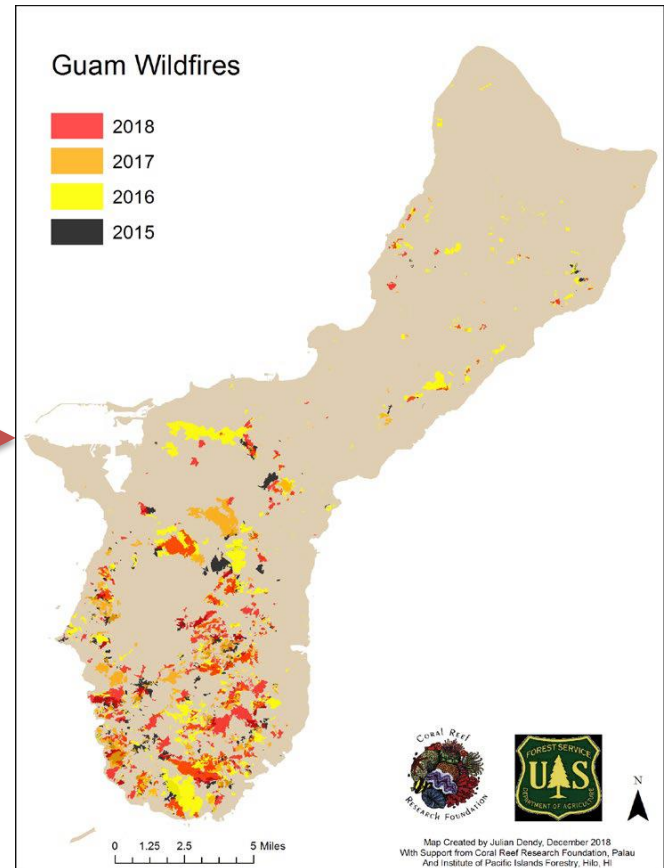
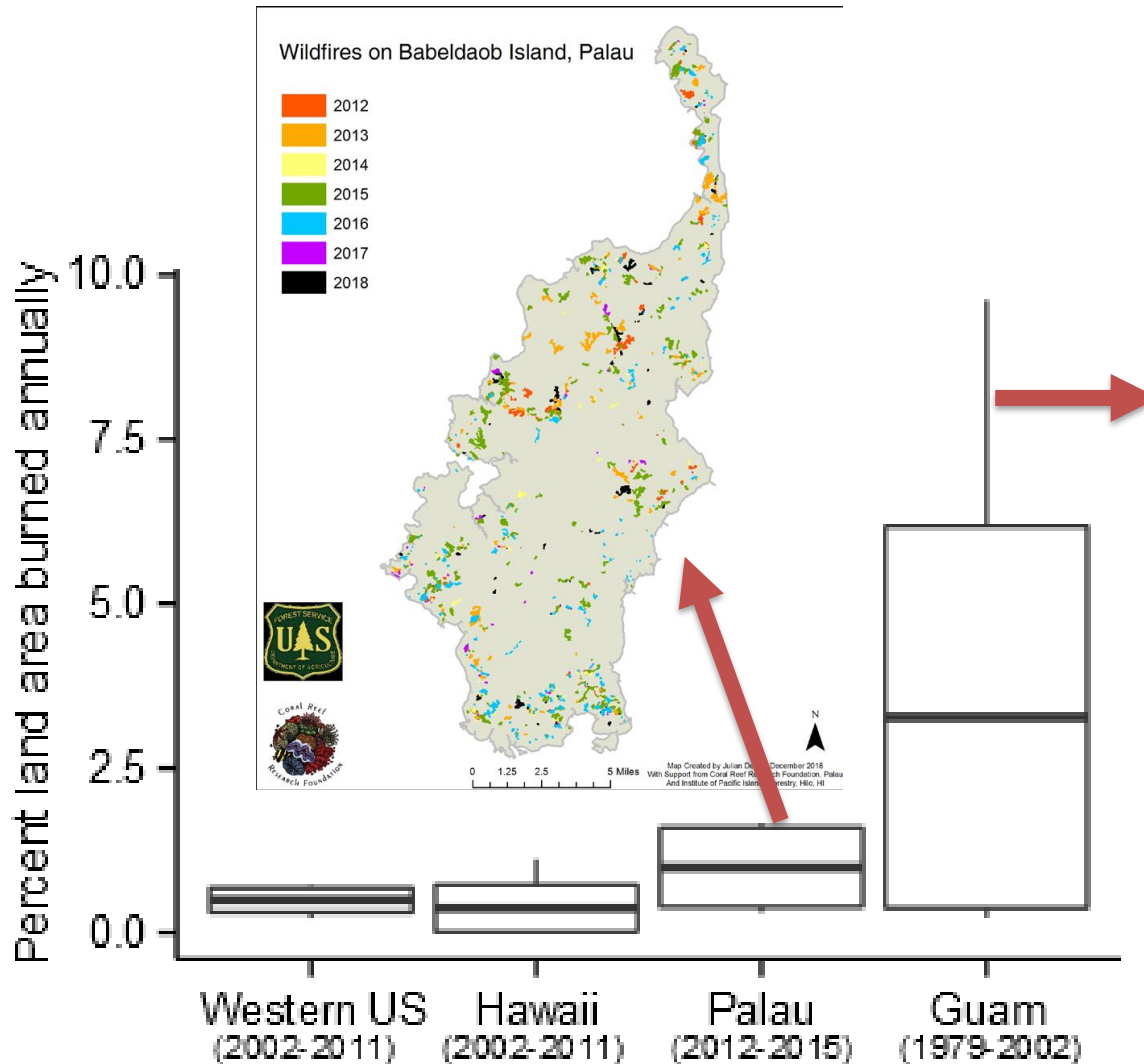
Issue: Invasive species pose one of the greatest threats to native biodiversity of islands.

Need: Controlling invasive trees is important for watershed management and protection or restoration of rare plants and ecosystems.

Approach: We have determined how *F. moluccana* invasion affects the composition, structure, and function of native-dominated Samoan forests and how these parameters respond to the removal of *F. moluccana*.



4. Fire in the Pacific



Data Source: Clay Trauernicht, PhD
Wildland Fire Specialist
University of Hawai'i at Manoa and
Julian Dendy Coral Reef Research
Foundation

5. Recovery of tropical forests

Issue : Forests in the Pacific were degraded by various land use activities that have left systems degraded

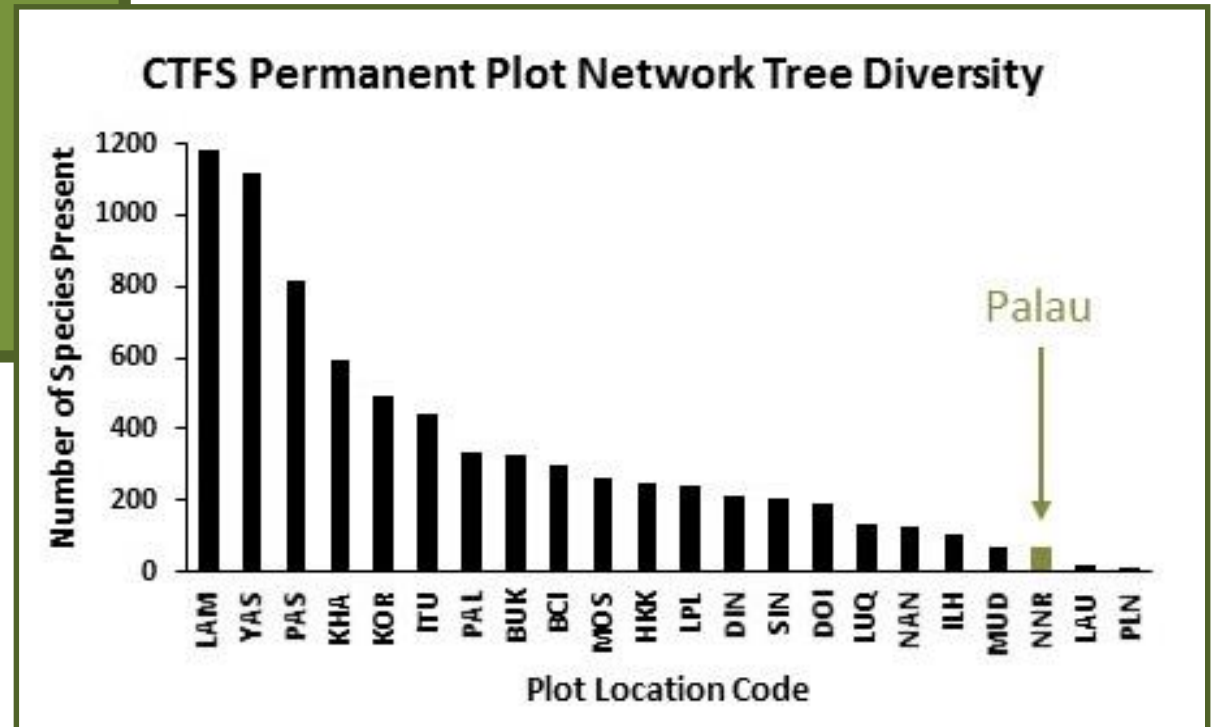
Need: Establish long-term plots for: 1) monitoring and modeling recovery of forests from disturbance, 2) understand the dynamics of indicator species such as orchids

Approach: 1) Determine the distribution and conditions needed for regeneration of tropical trees, 2) determine how orchid distribution and abundance change as forests recover from land use change



Global Comparisons

The Palau plot at NNR contains 3 times the number of tree species as the Hawaii permanent plot sites of LAU and PLN.



Summary

- Small islands pose unique natural management resource needs *thus*
- Small islands require unique solutions

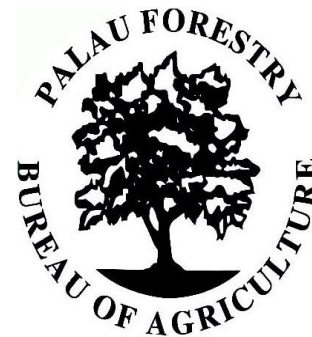
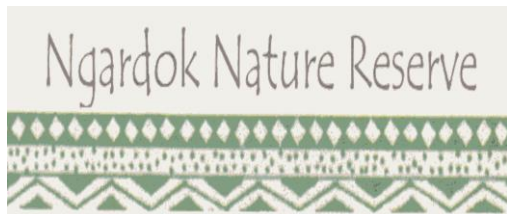




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