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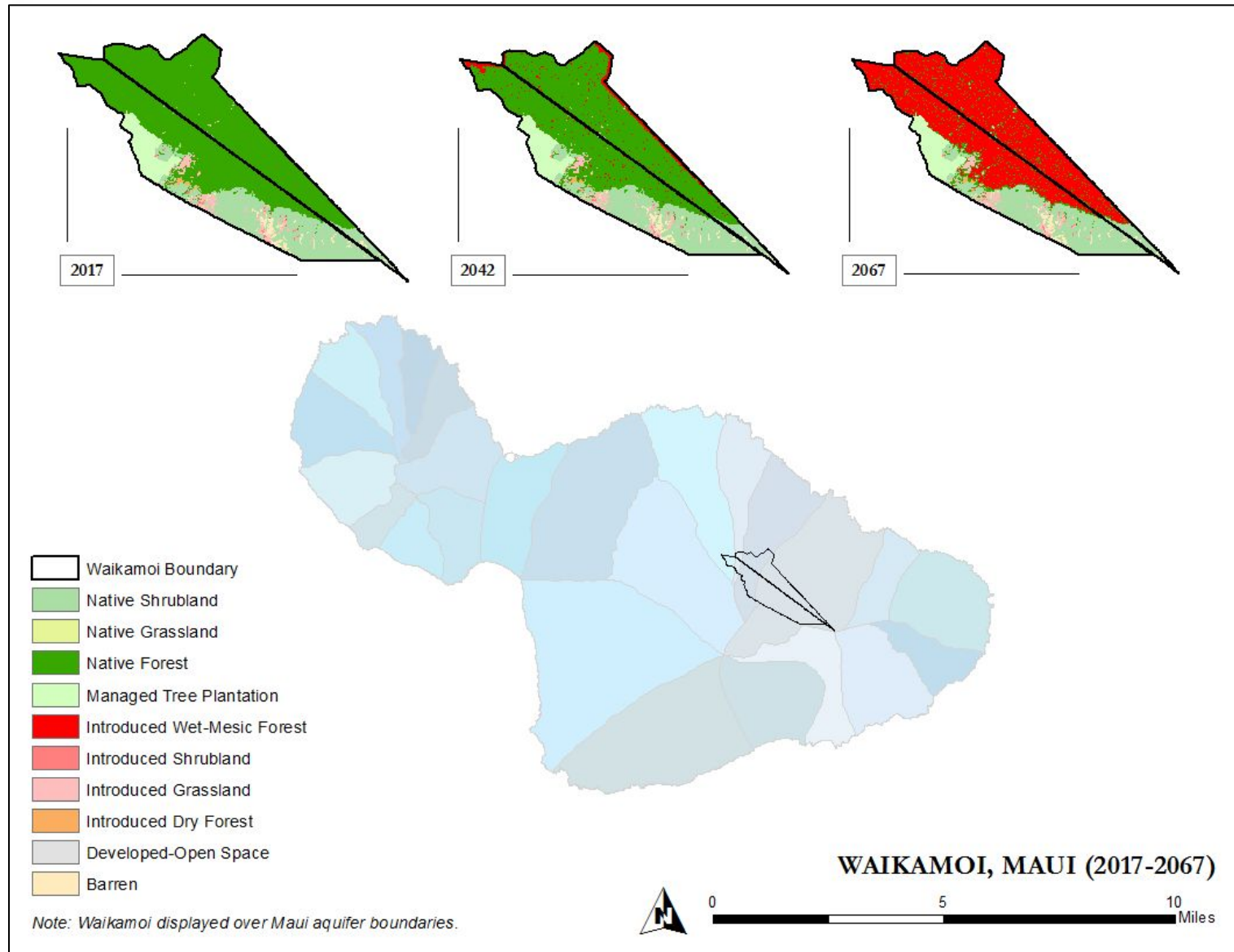
3rd Annual Maui Nui Natural Areas Weed Management Forum

Economic Valuation of The Nature Conservancy's Watershed Conservation Activities in Waikamoi Preserve, Maui

Leah Bremer, Christopher Wada, Kimberly Burnett,
Sarah Medoff, Jonathan Page, SangBin Lee, Kim
Falinski, Scott Allen

**Kahului, Hawaii
December 1, 2017**

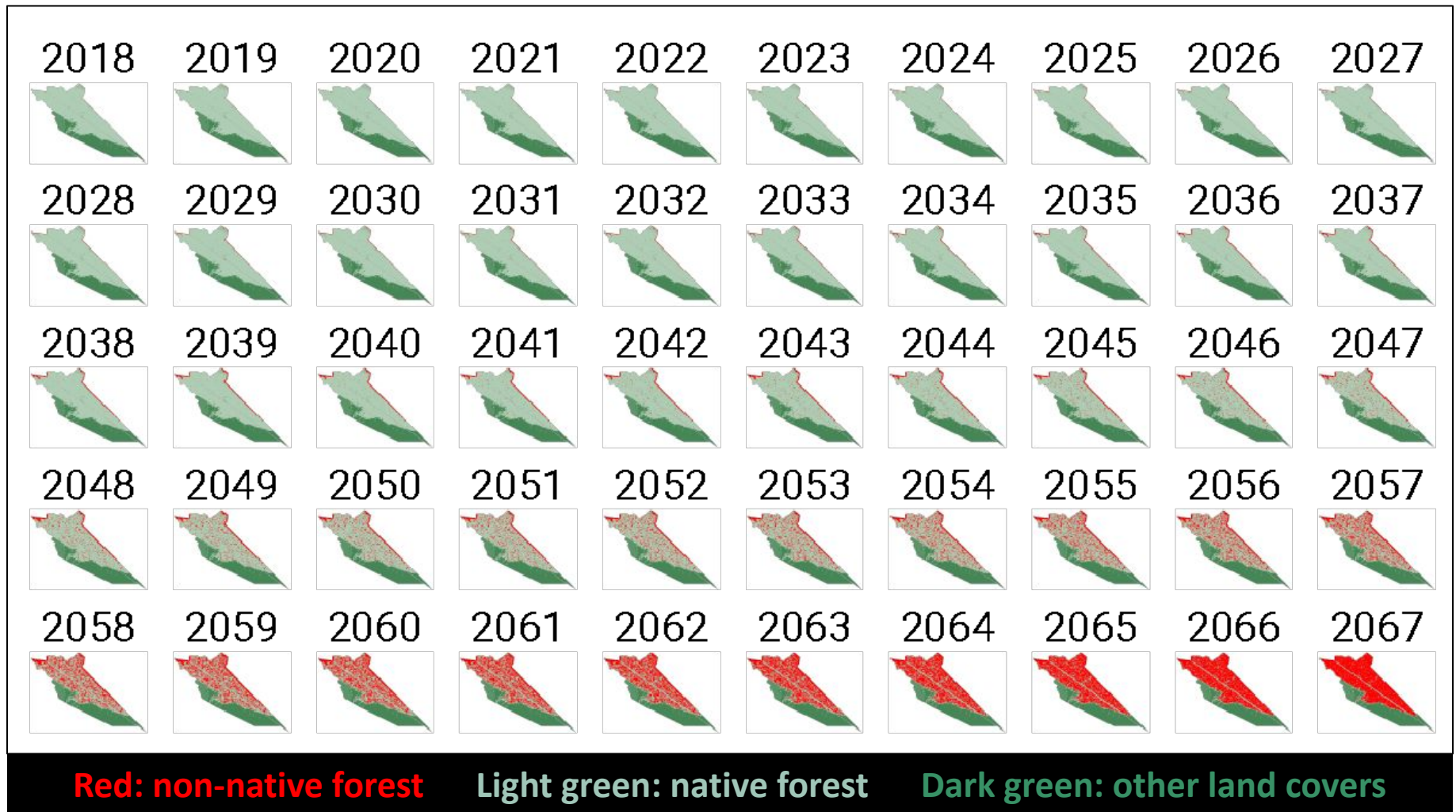
Waikamoi Preserve (5,230 acres) + EMI Parcel (3,721 acres)



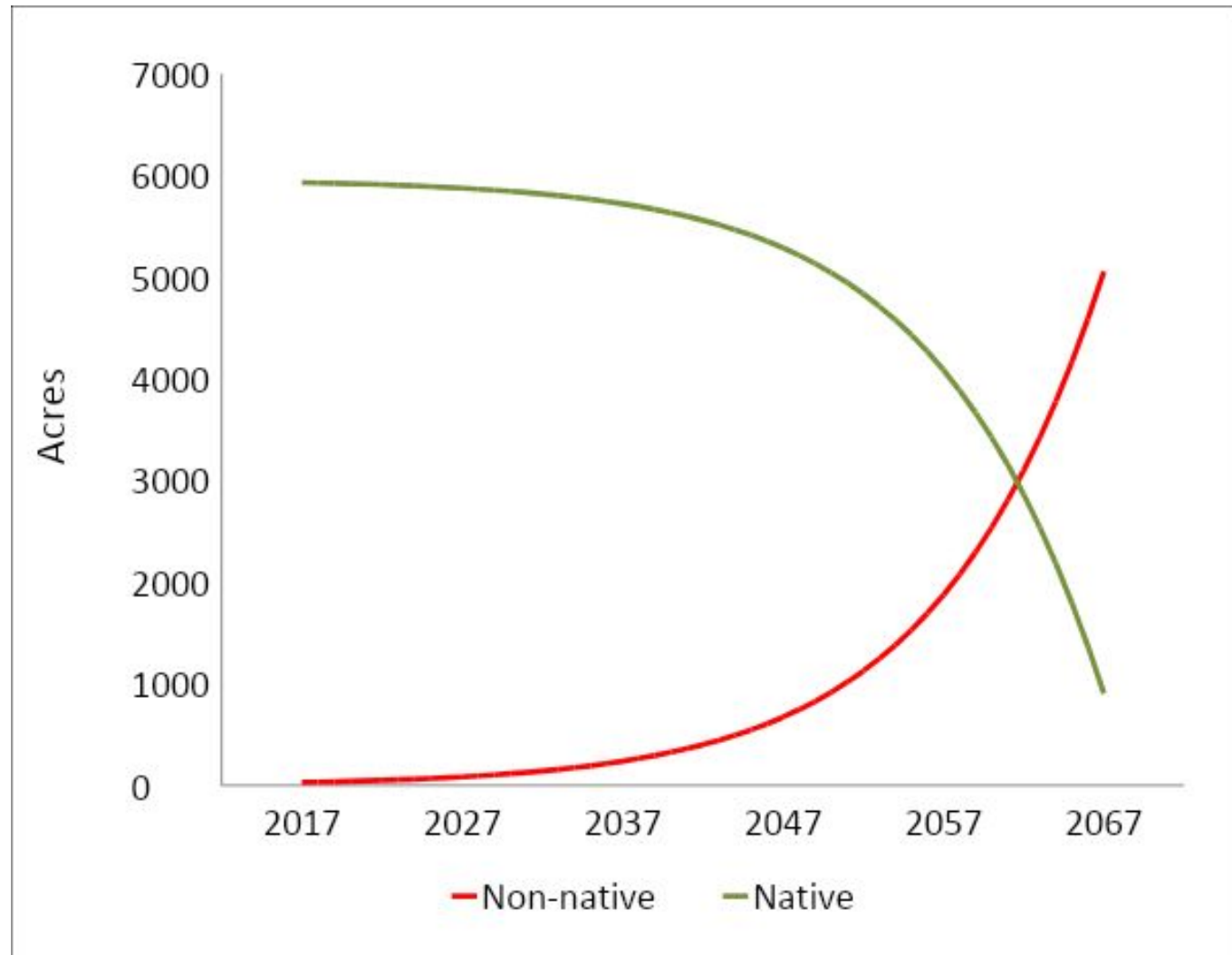
Economists doing “field work” in Waikamoi



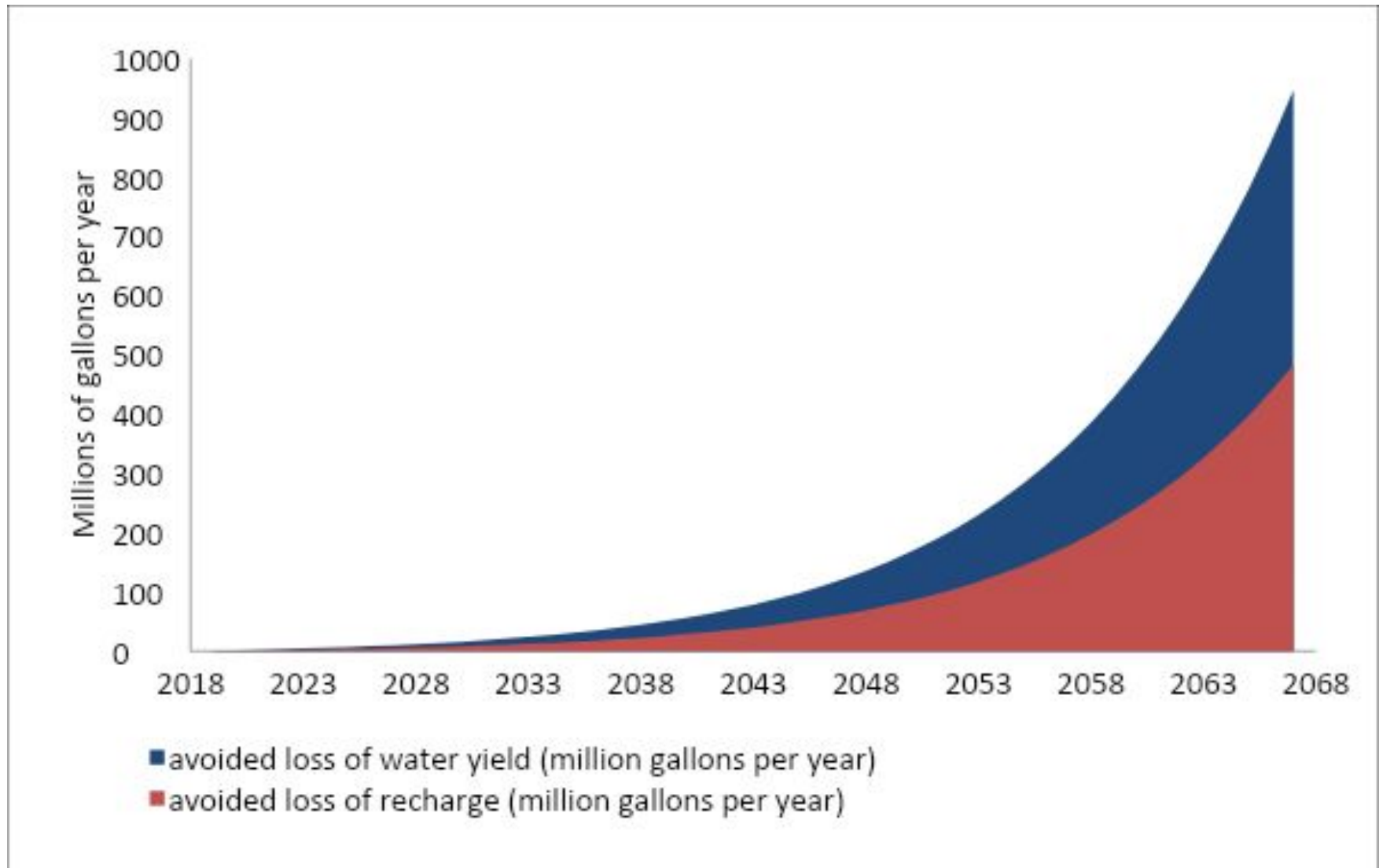
Land cover 2017-2067 (hypothetical invasion)



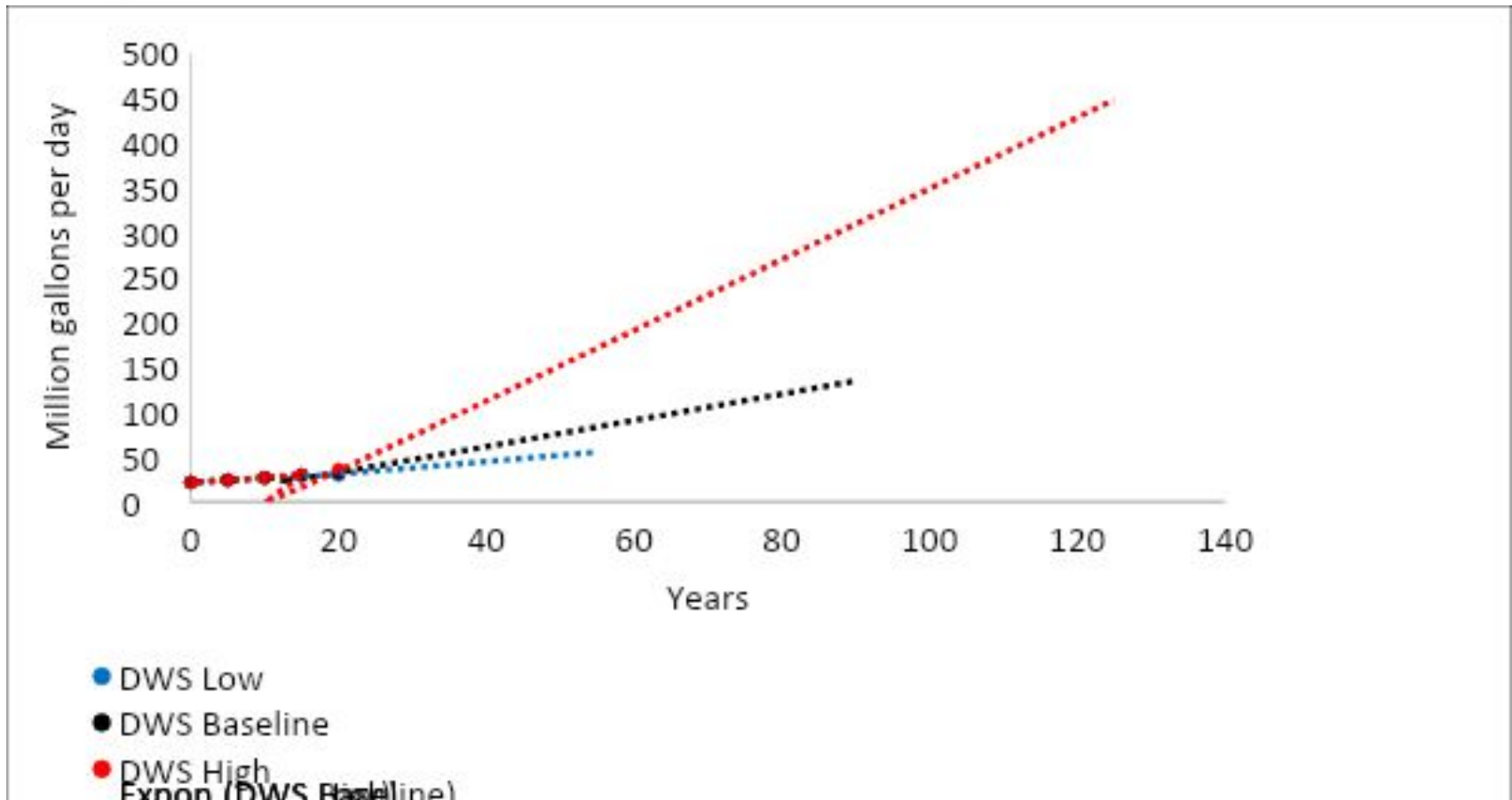
Total acres of native forest and non-native forest over time



Avoided loss of freshwater yield and groundwater recharge



Projected water consumption in Central/Wailuku areas

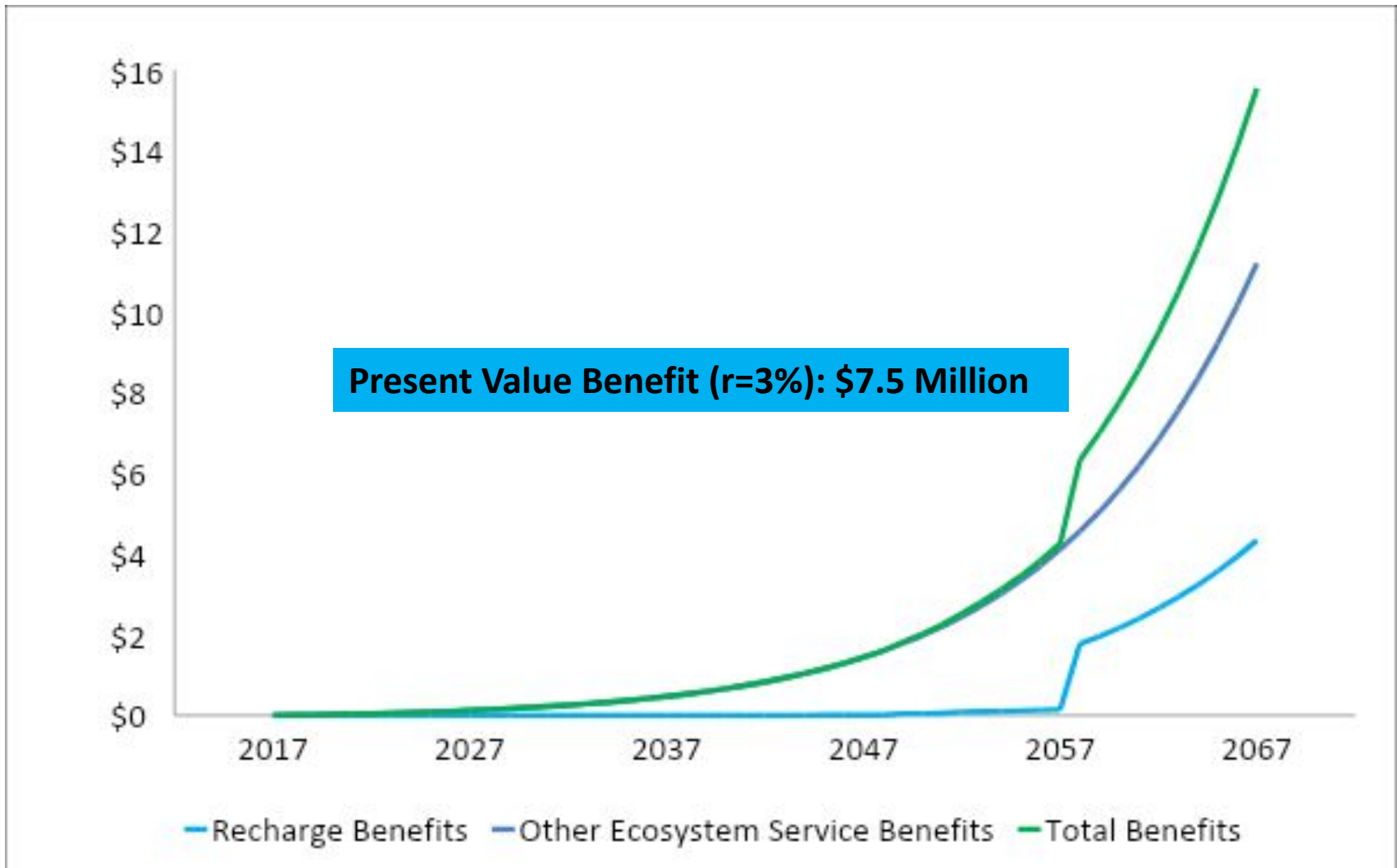


	2035	2045	2055	2065
Baseline consumption (MGD)	32.6	40.0	49.1	60.4
Shortfall (MGD)	14.0	21.4	30.6	41.8

Future potable water supply options

Source	SY (MGD)	90% of SY (MGD)	Current Pumpage (MGD)	Available Pumpage (MGD)	Unit Cost (\$/TG)
Haiku Aquifer	27	24.3	3.4	20.9	3.71
Waihee Aquifer	8	7.2	3.5	3.7	3.80
Waikapu Aquifer	3	2.7	0	2.7	4.25
Makawao Aquifer	7	6.3	0.4	5.9	4.50
Seawater Desalination					12.70

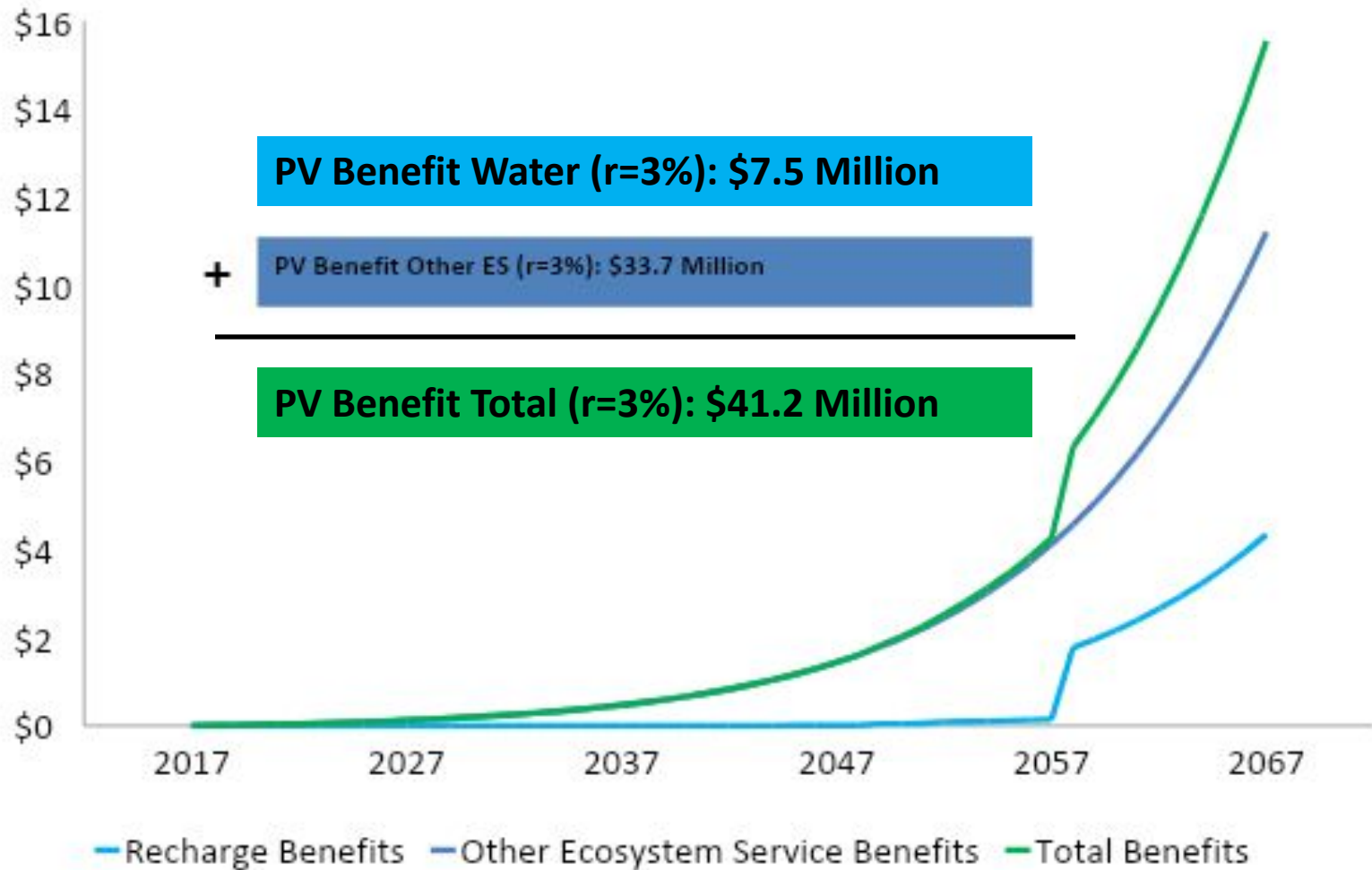
Monetized recharge benefits



Non-water ecosystem service benefits (de Groot et al. 2012)

Ecosystem service	Dollars/acre/year
Food	99
Raw materials	41
Genetic resources	6
Medicinal resources	742
Air quality regulation	6
Climate regulation	827
Disturbance moderation	33
Waste treatment	3
Erosion prevention	7
Nutrient cycling	1
Pollination	15
Biological control	5
Nursery services	8
Genetic diversity	8
Recreation	428
Total of all services	2230

Monetized ecosystem service benefits



Management Costs

- Ungulate control
- Weed control
- Invertebrate and small mammal control
- Monitoring
- Rare species protection and research
- Public outreach programs
- Personnel, equipment, and facilities

Past Expenditures
(1995-2017)

\$15.6 million

+

Projected Future
Maintenance Costs
(2017-2067)

\$700,000/yr

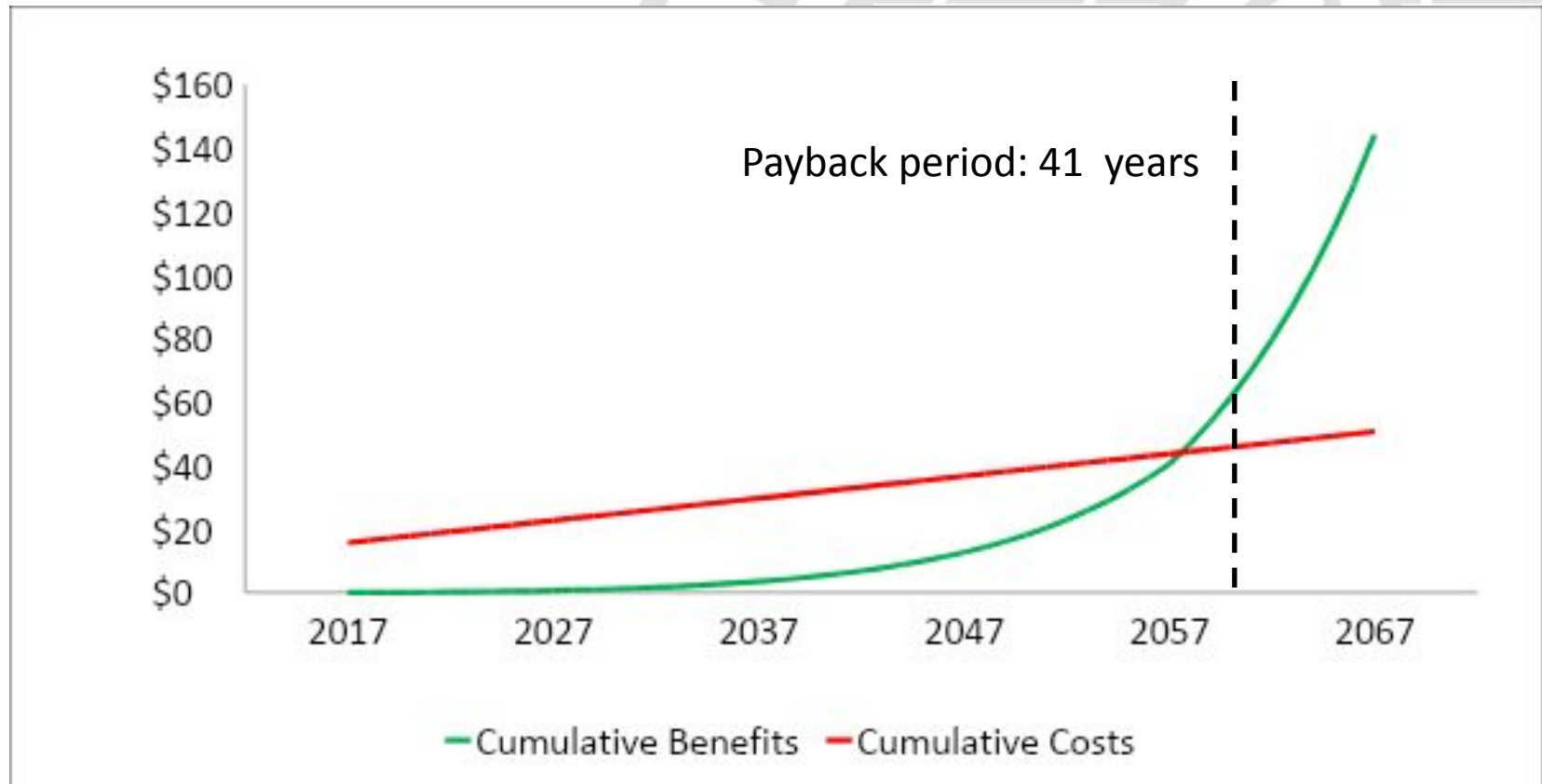
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PV Management
Costs

\$32.7 million

Comparison of Benefits and Costs

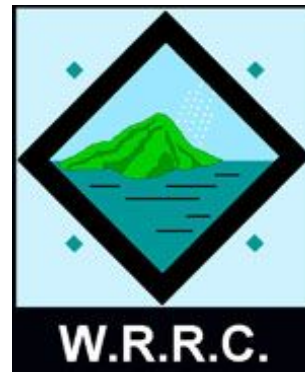
- **Net Present Value = PV Benefits – PV Costs = \$8.5 million**
- **Benefit-Cost Ratio = 1.26**
- **Return on Investment = 26%**



Mahalo!



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