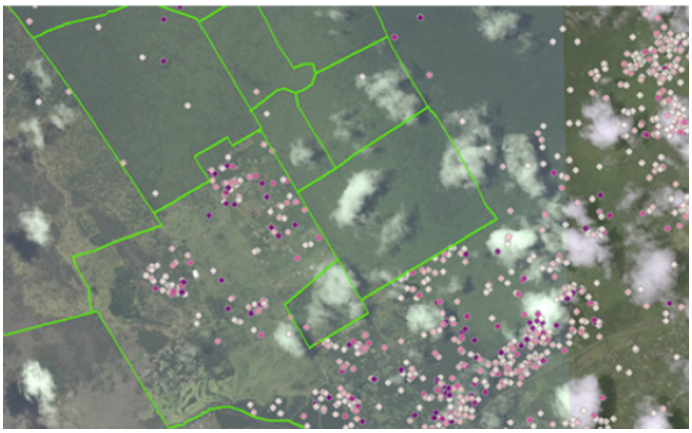
RAPID ʻŌHIʻA DEATH RESPONSE

DEPARTMENT OF LAND
AND NATURAL RESOURCES

ROD infected forest.

ʻSUMMARY

Rapid ʻŌhiʻa Death (ROD) is a fungal disease that has killed hundreds of thousands of native ʻōhiʻa (*Metrosideros polymorpha*) trees and affected more than 135,000 acres of forest on Hawai'i island. While much of the affected area has only scattered dead trees, some areas have lost as much as 90% of healthy canopy trees. The expansion of ROD on Hawai'i island poses the single greatest threat to Hawaii's main native tree species and watersheds, not just on Hawai'i Island, but throughout the state. DLNR is leading the multiagency response on Hawai'i Island, as well as carrying out early detection surveys on other islands.

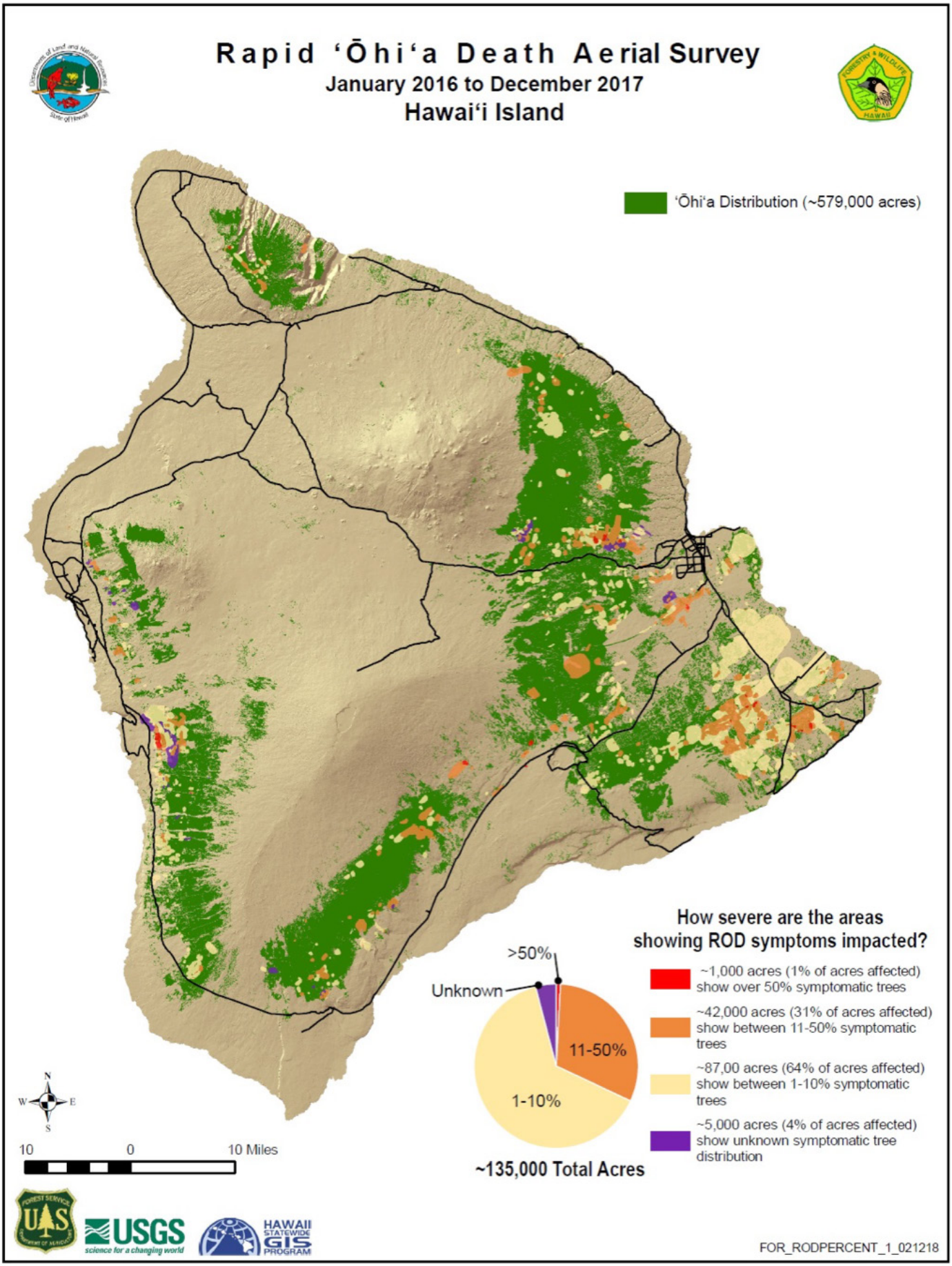


Fences (green lines) appear to protect forests from ROD near Volcano, Hawai'i Island.

THREAT TO OUR WATERSHEDS

Our native ʻōhiʻa forests are vital to aquifer recharge and help ensure an adequate supply of fresh water for drinking, agriculture, irrigation, and other uses. In addition to ROD monitoring and research, investments in watershed management and fencing projects are an important part of rapid response. Intact native forests have a much higher capacity to withstand impacts from ROD than unprotected areas. By investing money in watershed management and protection projects such as fencing, the State can ensure the perpetuation of healthy forests – more resilient to disease and able to continue providing clean, fresh water.

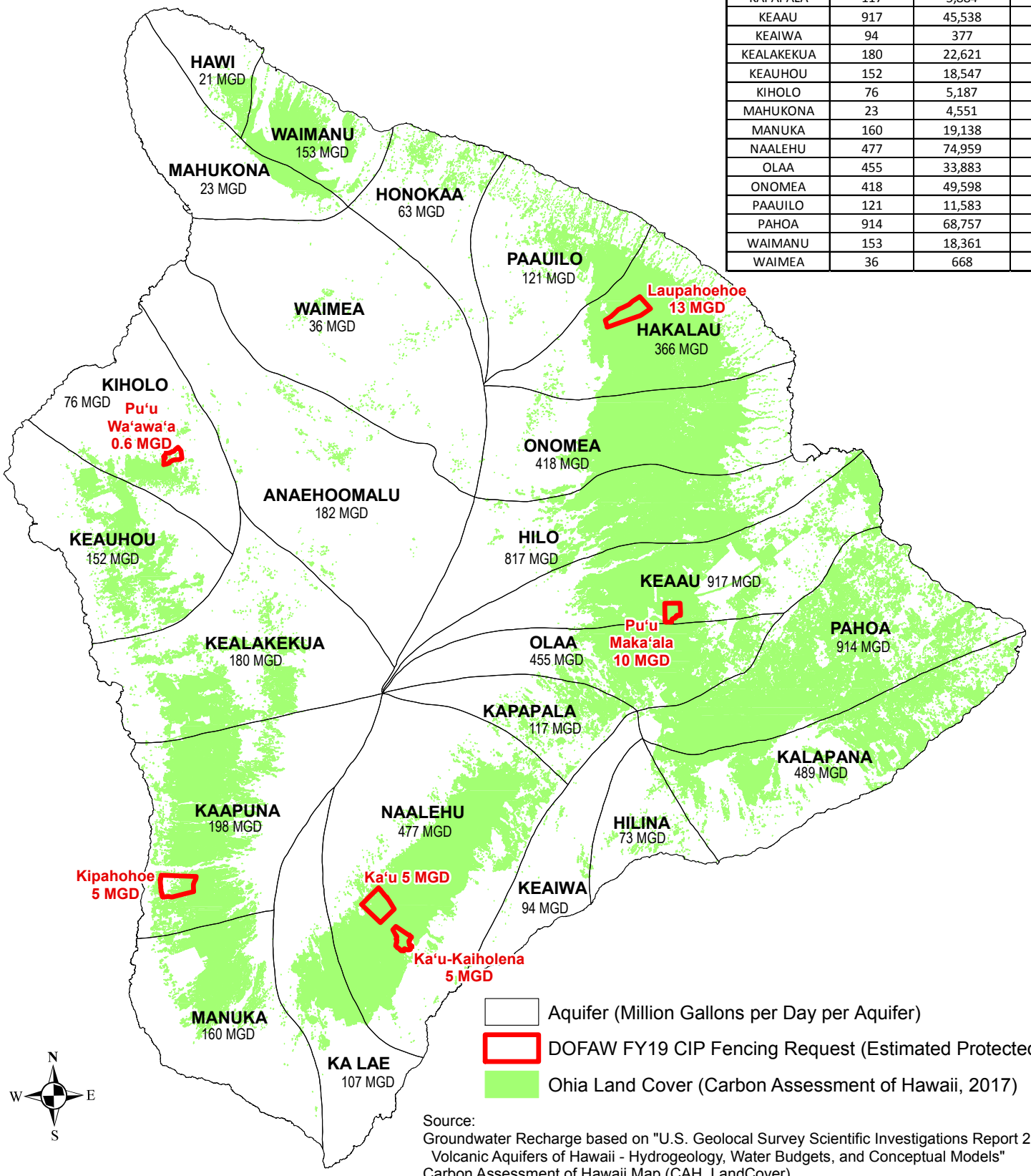
As shown on page 3 below, ʻōhiʻa forests are the dominant vegetation across much of the island's important recharge areas. **In fact, more than 1/3 of recharge on Hawai'i Island is associated with ʻōhiʻa forest**. Forests killed by ROD will be replaced by other vegetation, in many cases, invasive trees such as strawberry guava. Although we don't know how much recharge will be reduced by the conversion of ʻōhiʻa forests to non-native vegetation, research shows that strawberry guava trees evaporate 27-53% more water than native forests, causing extensive water loss (Giambelluca et al., 2008). In East Hawai'i, non-native vegetation has already reduced estimated groundwater recharge by 85 million gallons a day (Engott, 2011). More research is needed to understand the hydrology of ʻōhiʻa forests and quantify impacts of ʻōhiʻa forest replacement on water recharge.


Rapid ʻŌhiʻa Death Aerial Survey
January 2016 to December 2017
Hawaiʻi Island
ʻŌhiʻa Distribution (~579,000 acres)
How severe are the areas showing ROD symptoms impacted?
>50%
Unknown
11-50%
1-10%
~1,000 acres (1% of acres affected) show over 50% symptomatic trees
~42,000 acres (31% of acres affected) show between 11-50% symptomatic trees
~87,00 acres (64% of acres affected) show between 1-10% symptomatic trees
~5,000 acres (4% of acres affected) show unknown symptomatic tree distribution
~135,000 Total Acres
N
W
E
S
10
0
10 Miles
USGS
science for a changing world
HAWAII STATEWIDE GIS PROGRAM
FOR_RODPERCENT_1_021218

Rapid ʻŌhiʻa Death and Groundwater Recharge

Hawaii Island

AQUIFER	Total MGD of Aquifer	Ohia Acres w/in Aquifer	Ohia MGD w/in Aquifer
ANAEHOOMALU	182	973	0.6
HAKALAU	366	53,986	229
HAWI	21	3,402	7
HILINA	73	1,137	2
HILO	817	42,955	424
HONOKAA	63	2,133	2
KA LAE	107	13,728	20
KAAPUNA	198	48,196	82
KALAPANA	489	34,661	124
KAPAPALA	117	5,884	14
KEAAU	917	45,538	388
KEAIWA	94	377	0.04
KEALAKEKUA	180	22,621	30.7
KEAUHOU	152	18,547	27.7
KIHOLO	76	5,187	2.8
MAHUKONA	23	4,551	9.5
MANUKA	160	19,138	27.6
NAALEHU	477	74,959	216.1
OLAA	455	33,883	242.4
ONOMEA	418	49,598	236.6
PAAUILO	121	11,583	29.2
PAHOA	914	68,757	418.2
WAIMANU	153	18,361	82
WAIMEA	36	668	0.1



Source:
Groundwater Recharge based on "U.S. Geolocal Survey Scientific Investigations Report 2015-5164: Volcanic Aquifers of Hawaii - Hydrogeology, Water Budgets, and Conceptual Models"
Carbon Assessment of Hawaii Map (CAH_LandCover)
USGS, 2017
Aquifer, DLNR, 2014

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