2021 WMP Update Workshop

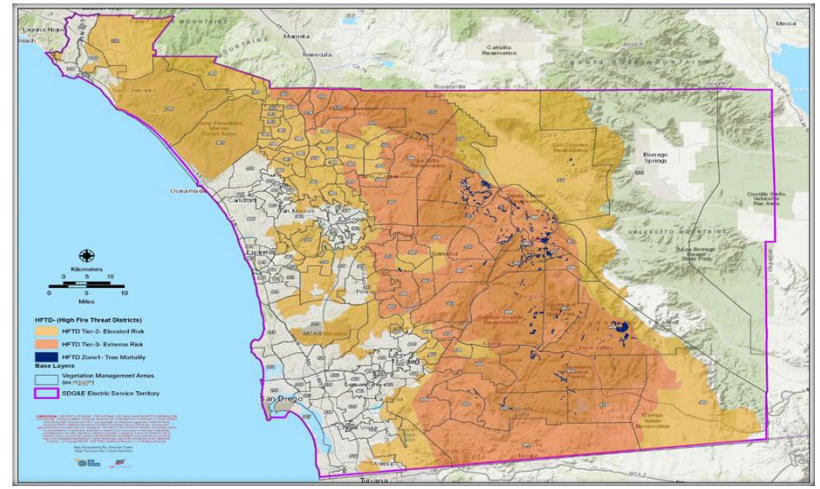
Vegetation Management: Inspection, Strategy and Pilots

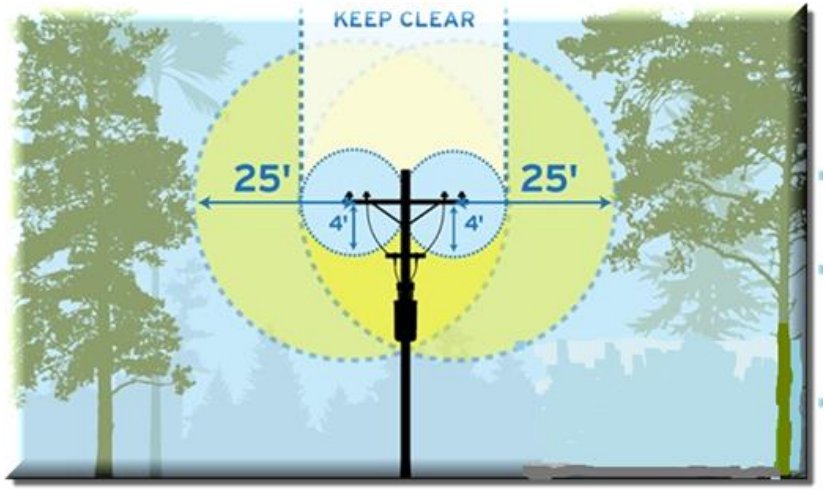
February 23, 2021

Vegetation Management Overview

- Tracking 457,000 inventory trees
- SDG&E Service Territory divided into 133 Vegetation Management Areas (VMA)
- Master Annual Activity Schedule
- HFTD ~54% of total system OH miles
- Maximize post-trim clearances 12 - 25ft; Removal of all direct overhangs



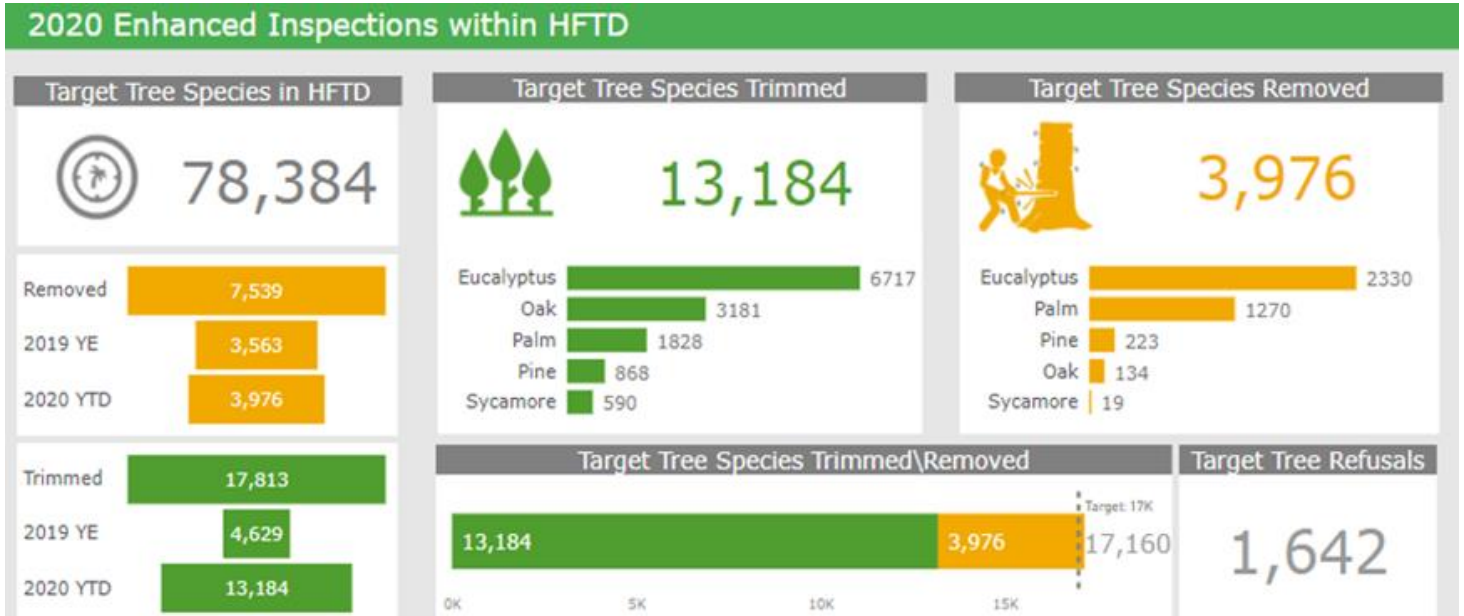




2020	Trimmed	Removed
Non-HFTD	124,182	7,739
HFTD	97,304	5,245

Inspection Activities

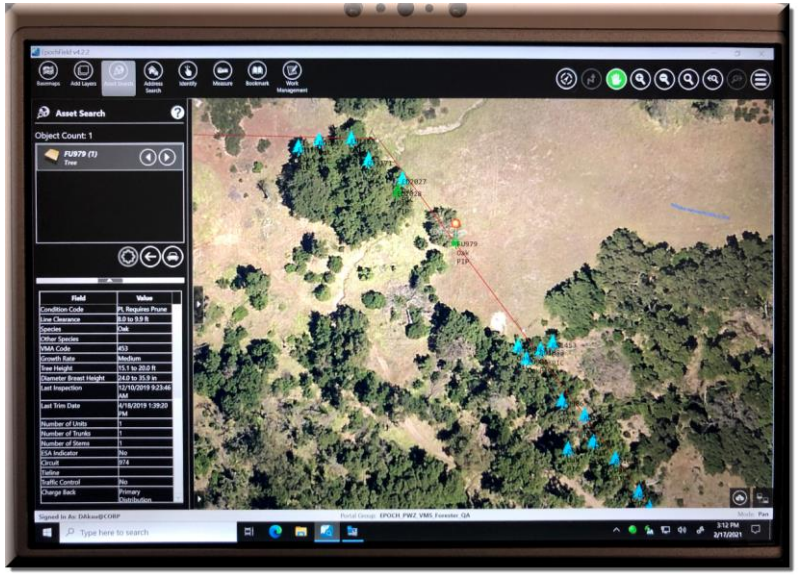
- Four internal SDG&E Patrollers (Certified Arborists) for HFTD inspections and pre-event patrols
- Additional, mid-cycle hazard tree inspection activity within HFTD
- Data collection at the individual tree level
- Continued enhanced post-trim clearances > 12ft on targeted species within HFTD were prudent in consideration of risk (failure characteristics, growth potential)
- Inspection scope increased to include all secondary-voltage facilities
- Collaboration with local colleges to develop utility arboricultural curriculum





Vegetation Management Database

- All activities and contractors operate within the electronic workflow environment
- All data uploaded nightly to central server; viewable to all users the following day
- 2020 - Development of new electronic work management system (EPOCH). Improvements in data gathering, work efficiencies, robust asset history, detailed reporting
- Improved GIS mapping capabilities
- Accurate GPS positioning of each inventory tree
- Enhanced tree data capture for more granular analysis
- Updated information for improved customer notification and engagement



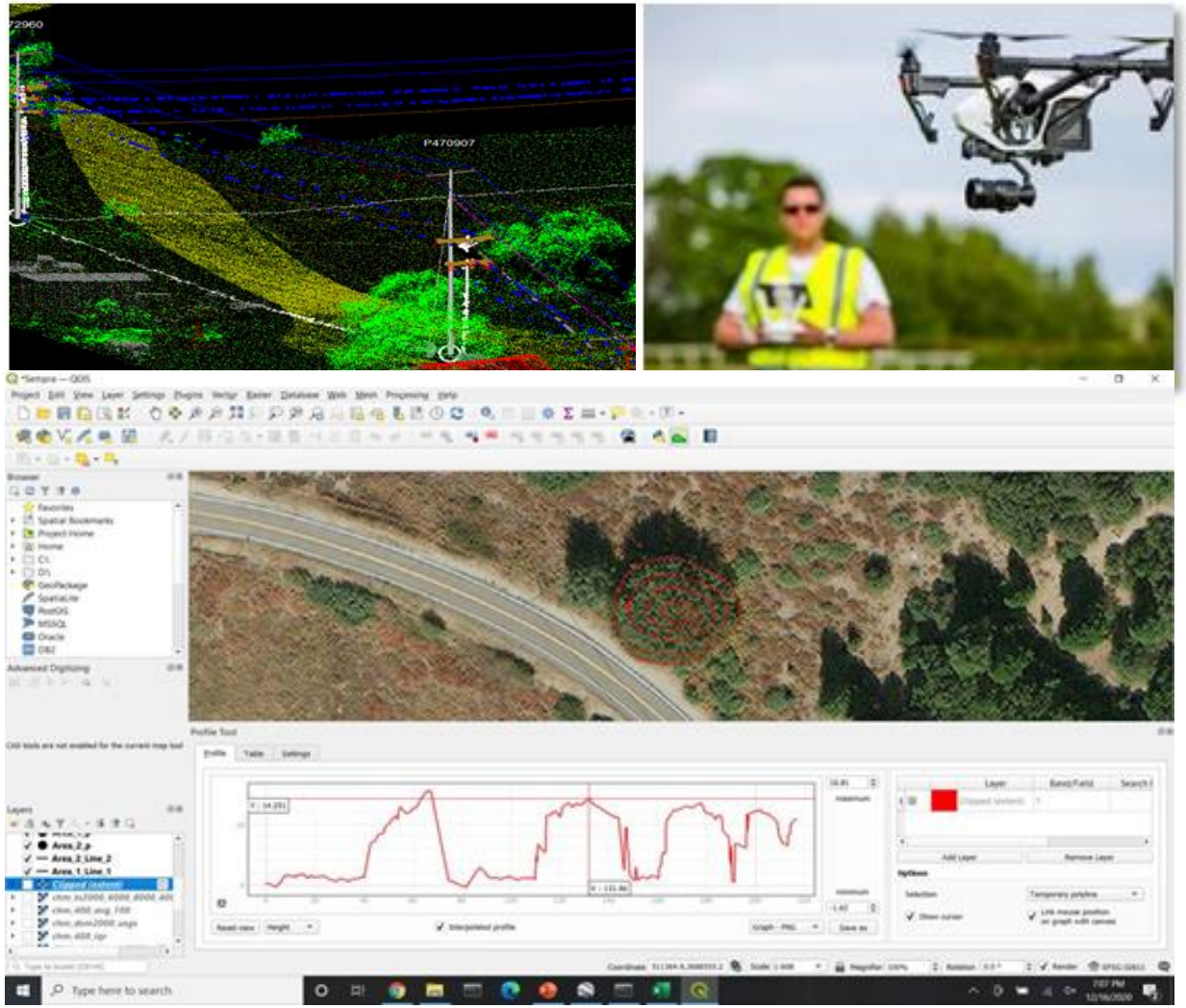


2020 Technologies

LiDAR
- C214 Pilot to validate clearance data and inspection integration
- Using UAS (drones) to capture imagery and LiDAR for inspections and QA/QC post-construction activities: 1,289 observations in 2020
- Data will aid in predictive modeling of vegetation growth patterns, provide comprehensive GIS right-of-way inventories, and assist in identifying high fire risk areas

Satellite Imagery
- C214 Proof of Concept
- Assess vegetation height and clearance to understand the potential risk and impact on encroachment
- Higher frequency of imaging compared with LiDAR

Vegetation Risk Index
- Merging Meteorology and tree and outage data
- Engaging UCSD Supercomputing team to develop risk analysis and predictive modeling



Vegetation Management Sustainability

Committed to environmental stewardship and the initiative to reduce GHG and carbon footprint

- Tree operations include the removal of all green waste material off-site with the exception of large rounds associated with tree removal
- Upon request, chipped material is left with customers for ground cover, landscaping, etc.
- In 2020, SDG&E entered into agreement with a second 100% recyclable vendor (Agri-Services) to divert from landfill

Green Waste Diverted to Recycle	Tonnage
2019	3,500
2020	4,540





2020 Vegetation Clearance Analysis

Vegetation contact study to determine the relationship between tree-related outage frequency and post-trim clearances (2002–2020)

- Data indicates greater clearances result in reduced outages
- SDG&E is not aware of any outage from a targeted species trimmed to 20-30' that cause an outage in the HFTD (excludes root failure fall in trees)
- From an RSE standpoint, that's going from a contact rate of .14 to zero. According to the data, if SDG&E completed this program on all targeted trees, we would reduce average veg contacts by 6.3 per year

