

Hawaiian Electric

Wildfire Safety Strategy (WSS) Preparation

Wildfire Risk Model – Detailed Discussion

September 26, 2024

Today's Discussion Topics

Introduction to WF risk modeling

Requirements and Capabilities for the WF risk model

Informing mitigation decisions

Ground Rules

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Measuring Wildfire Risk Reduction Progress and Effectiveness in the State

Core Concept 4: Everyone plays a role

**Everyone has a role
in adapting to wildfire**



Land
Stewards

Residents

Policy-makers
& Community
Leaders

Emergency
responders

Planners
Developers
Utilities

Source: HWMO, Hawaiian Electric Wildfire Safety Symposium, April 2024

Core Concept 2: Wildfire risk can be reduced

**There is a lot we can do to
reduce wildfire occurrence, fire spread, & severity**



Reduce ignitions



**Manage land &
reduce fuel**



**Make homes & towns safer
& ignition-resistant**

Wildfire Risk is Unique to Each Utility

Present Day

- Agriculture, climate change, invasive species are changing and elevating WF risk in Hawai'i
- Capital and operational programs need to reflect increasing risk

Complication

- There is no “off-the-shelf” solution to WF risk & mitigation strategy -- each utility is unique
- Hawai'i is particularly unique in geography, climate, vegetation, and weather seasonality

Evolution

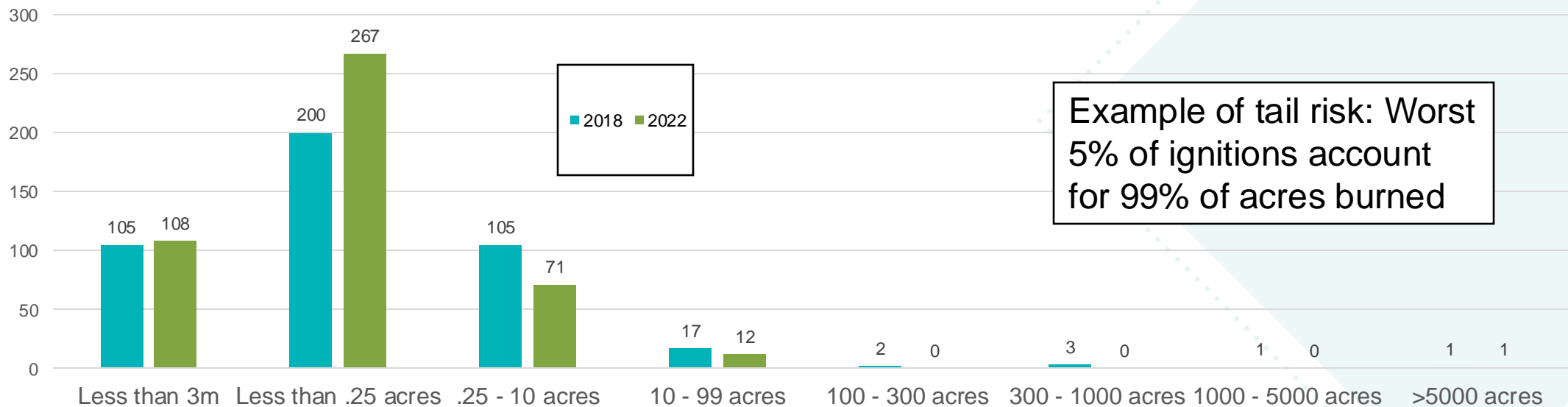
- WF risk mitigation, situational awareness, and transmission and technologies are evolving to address risk
- Risk reduction will continue to evolve over time with added capabilities to better optimize mitigation

A whole of society approach is needed; risk reduction activities from partners, stakeholders, and residents can impact modeled risk

Wildfire is a Tail Risk

Models and analysis should account for rare events

A California Utility Reportable Ignitions*
434 in 2018 & 467 in 2022



Example of tail risk: Worst 5% of ignitions account for 99% of acres burned

<https://www.cpuc.ca.gov/industries-and-topics/wildfires>

* California PUC requires utilities to report ignitions involving their equipment that meet the following criteria, per [D.14-02-015](#):

1. A self-propagating fire of material other than electrical and/or communication facilities; and
2. The resulting fire traveled greater than one linear meter from the ignition point; and
3. The utility has knowledge that the fire occurred.

A Wildfire Risk Model Informs Risk Mitigation Decisions and Strategies

Wildfire Risk Model provides:

- Risk ranking of circuits
- Risk Spend Efficiency (RSE) of WF risk mitigants
- Estimated effectiveness of system hardening measures
- Informed deployment of operational mitigations
- Insight into data collection improvements to drive future risk assessment improvements

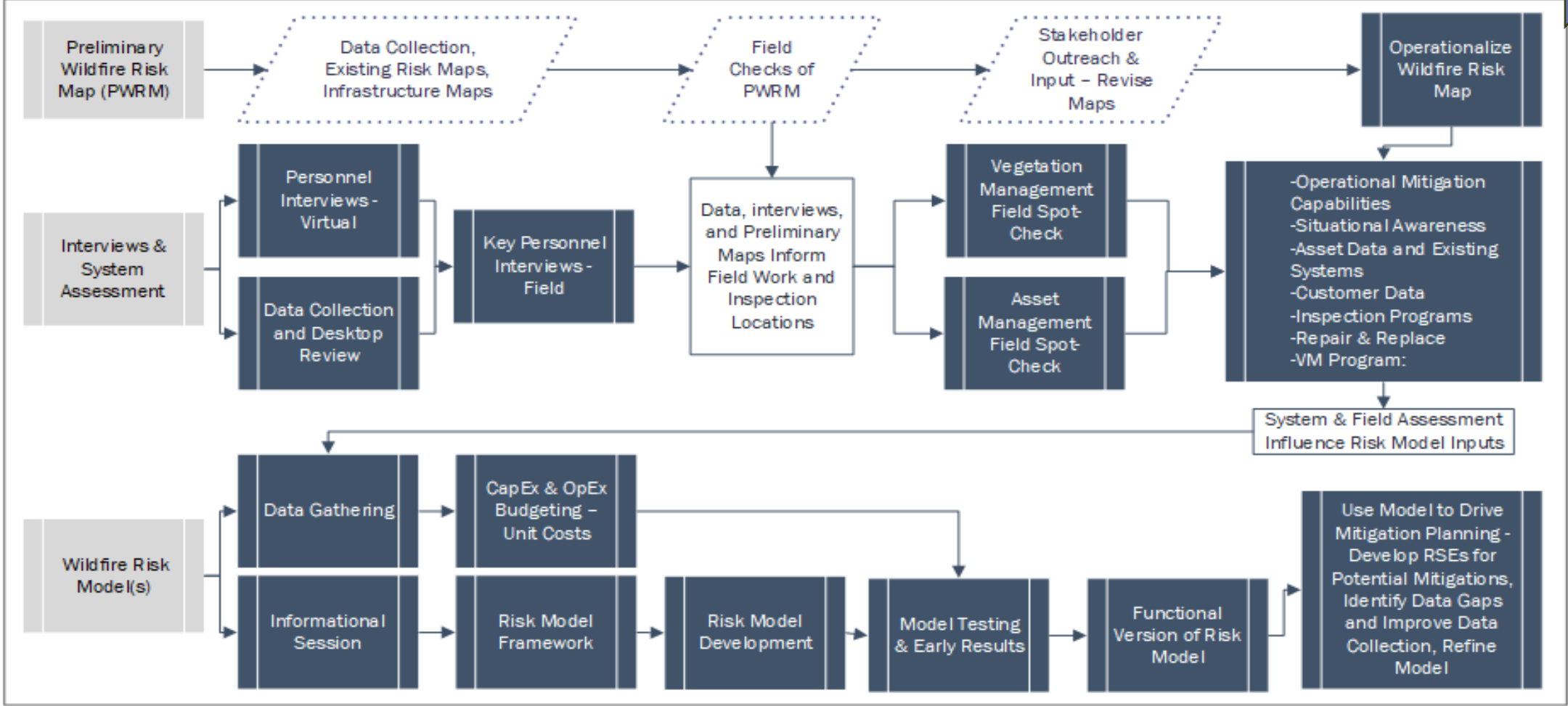


Wildfire Mitigation Strategy

- Implementation of most effective wildfire mitigations in reducing risk
- Informed by available data (asset data, inspection and maintenance information, ignitions, and outages) and customized risk analyses
- Supporting operational mitigations correlated to risk areas (mapping)
- Support improvements to inspection (asset, vegetation management, outage, etc.) and QA/QC programs

Multiple Processes Undertaken to Develop Model

Model development is highly collaborative – building on and incorporating work that is underway



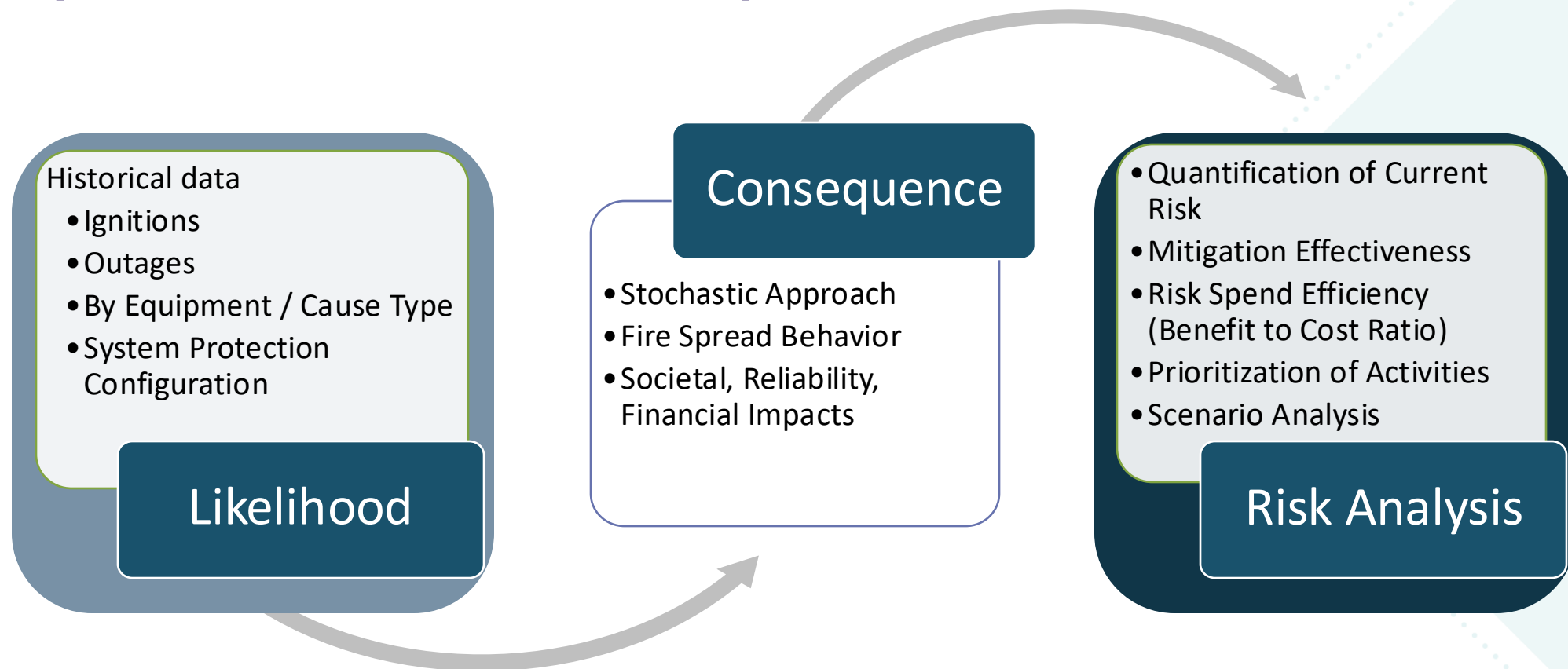
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Requirements and Capabilities for the Model



Discussion: What capabilities might be missing or other considerations, especially around consequence?

Risk Bowtie Methodology

Ignition Drivers and Likelihood of Ignitions

Equipment Failure

(Conductors, Poles, Connectors/Splices)

External Objects

(Vegetation, Animals, Metallic Ballons, Vehicles)

Asset Data

Historical Weather

Risk Event

Wildfire risk associated with electric assets in elevated wildfire risk areas

Consequences

Safety

(Public and Worker Safety)

Reliability

(Extended Customer Outages)

Financial

(Acres and Structure)

Environmental

(Fire Spread and Propagation)

Wildfire Consequences

Defining “Risk Spend Efficiency”

$$RSE = \frac{(Annual\ Risk\ Reduction) \times (Project\ Life)}{Cost\ of\ Project}$$

RSE is widely used by the California utilities but is only one component in the mitigation prioritization and selection process

- Model aids the decision maker – by providing a useful tool for risk-informed decision-making
- A custom model will allow for the assessment and selection of potential mitigants
- Model assists by generating cost/benefit quantification where **benefit = risk reduction**
- The development of the model will help drive future investments, including where to improve data collection

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Other Considerations for Investment Decisions

Input from subject matter experts, benchmark inputs and assumptions with other utilities, and other considerations also influence prioritization decisions

- The WF risk model is not a decision maker – but is a tool for risk-informed decision-making
 - Uncertainty of inputs is large, improving over time as data and experiences evolve
- The model will allow for the screening of potential mitigants that need to be informed by other factors:
 - Equity/social vulnerability, critical facilities, limited egress, PSPS reduction impact
 - Customer and public safety
 - Affordability and financial
 - Execution capacity
- The development of the model will help drive future investments, including where to improve data collection

Risk informed decision-making will evolve as experience is gained with new operational programs and hardening programs

Immediate Actions (year 1)

- Increased visual inspections and vegetation management
- Increased situational awareness
- Replace higher risk equipment
- Develop initial PSPS processes

Planned Mitigations (years 1 – 3)

- Develop risk models
- Expand situational awareness
- Grid hardening in higher risk areas
- Enhanced inspections
- Expanded vegetation management
- Improved fire and weather forecast data
- Targeted PSPS

Improve Operations

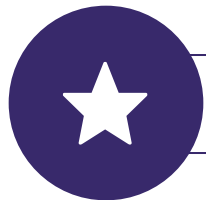
Harden the Grid

Partner with Stakeholders

Expand Situational Awareness

Longer term (3+ years)

- Improve risk models
- Risk prioritized hardening, inspections, and vegetation management
- Integration of new technologies and automation
- Further refined targeted PSPS



We are here

Time

Risk Reduction

Next Steps



Next Meeting
October 9, 2024



Feel free to provide any additional feedback

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WFS WG Webpage: <https://www.hawaiianelectric.com/safety-and-outages/wildfire-safety/wildfire-safety-working-group-documents>



Mahalo!
