HCP Committee

From: Karla Peters <Karla.Peters@co.maui.hi.us>
Sent: Wednesday, June 15, 2022 4:06 PM
To: HCP Committee
Cc: Lisa Sakumoto; Samual Marvel
Subject: HCP-51
Attachments: Maui VA Study_County Council Presentation_16Jun2022_V2-FINAL.pdf

Aloha,

Attached is the presentation for Beach Parks Vulnerability and Adaptation Study Phase I- Executive Summary (HCP-51).

Thank you!
Karla

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Our Mission: "Provide safe, satisfying and cost effective recreational opportunities for the residents of and visitors to Maui County."

County of Maui

Beach Parks Vulnerability and Adaptation Study

Department of Parks and Recreation

Tetra Tech, Inc.

UH Sea Grant College Program

TETRA TECH

June 16, 2022


CAUTION

The Maui News
September 20, 2020

Coastal erosion threatens parks

Baldwin Beach Park's doomed pavilion is a *"poster child"* for the damage coastal erosion and sea level rise cause.

This newspaper has been chronicling the pavilion's plight for decades. Almost every August or September we run a story or photos showing how currents, wind and waves have cut into the beach to create cliffs where a month earlier was a hill of gently sloping sand. The progression of photos shows the ocean advancing farther inland each year to nibble away at the pavilion and tumble its amenities and shade trees one by one into the sea.

Study Objectives

- Assess vulnerability of parks to coastal hazards and sea level rise
- Evaluate the potential for each beach park to adapt to future conditions
- Provide information to guide decisions on capital projects
- Recommend policies, strategies, and actions to address the short and long-term impacts of climate change

Two Phases

Phase I (2020 – 2021)

- ✓ Assessed vulnerability for 65 parks
- ✓ Developed a range of adaptation strategies
- ✓ Developed web-based mapping applications and train staff on use
- Preparing draft interim report

Phase 2 (2021 – 2022)

- Develop adaptation concepts and early actions for 5 parks
- Initiate community outreach
- Update web-based tools
- Final project report

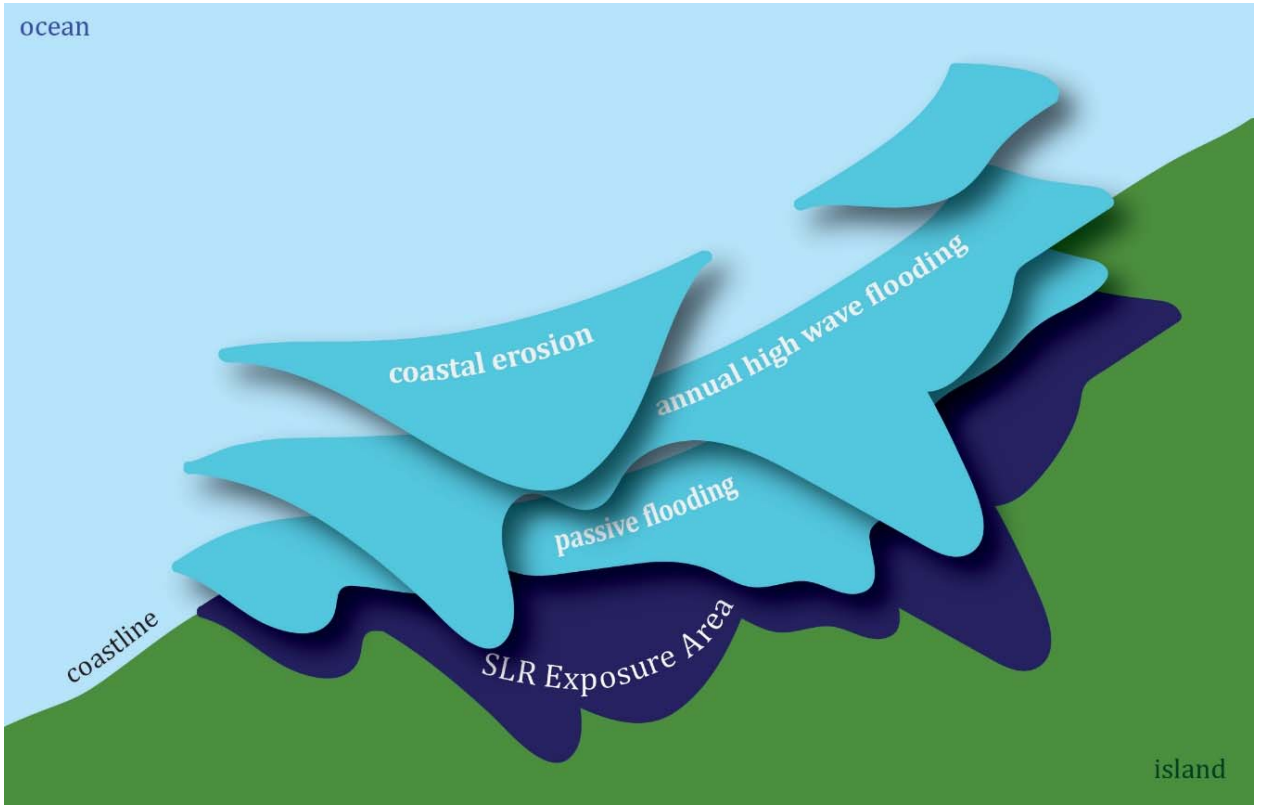
Key Points

- *County needs to start planning/budgeting now* for SLR impacts and adaption, even though we think we might have 20-30 years
- This is *not just a parks problem* -- it involves almost all departments in the county and some state agencies
- Parks department will now be *using the findings in future CIP projects and long-term planning*

Sea Level Rise Exposure Area (SLRXA)

- SLRXA depicts chronic coastal flooding and land loss with sea level rise from:
  - Passive flooding
  - Annual high wave flooding
  - Coastal erosion

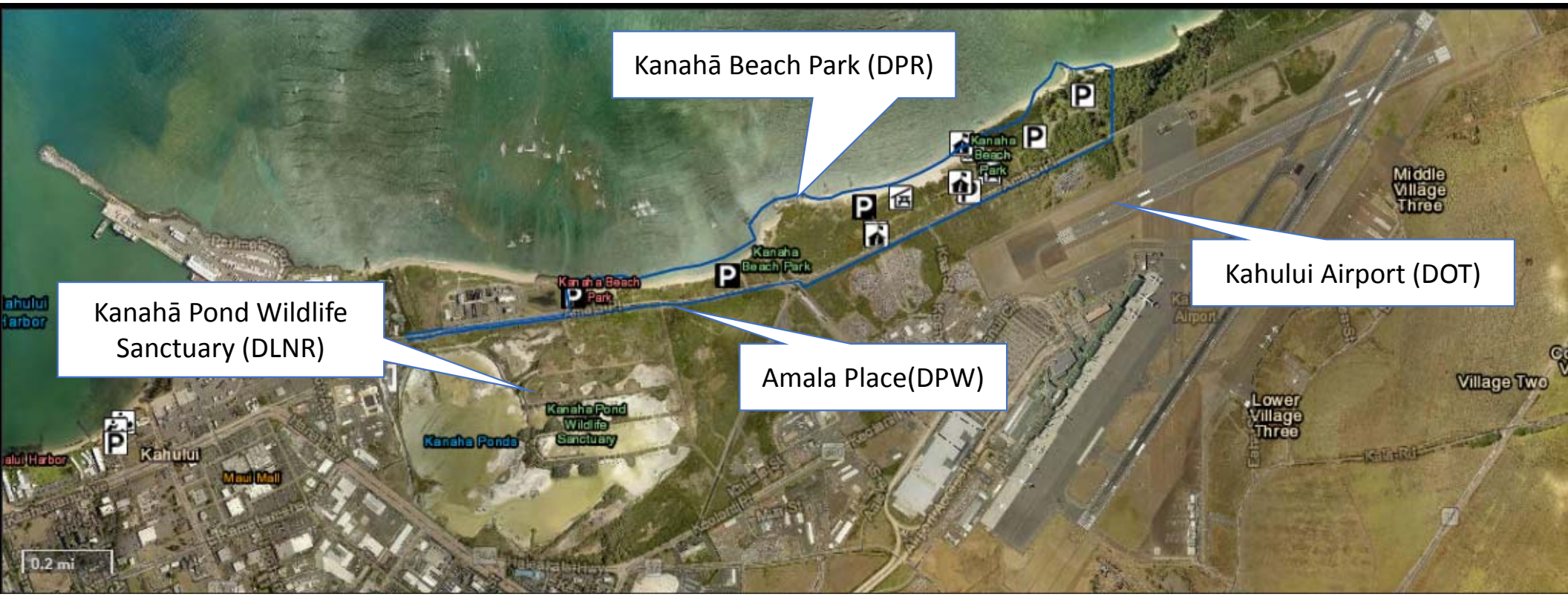
- Vulnerability assessed for 2.0 and 3.0 feet of sea level rise.
  - SLRXA-2.0 (~2070, near-term)
  - SLRXA-3.2 (~2090, long-term)



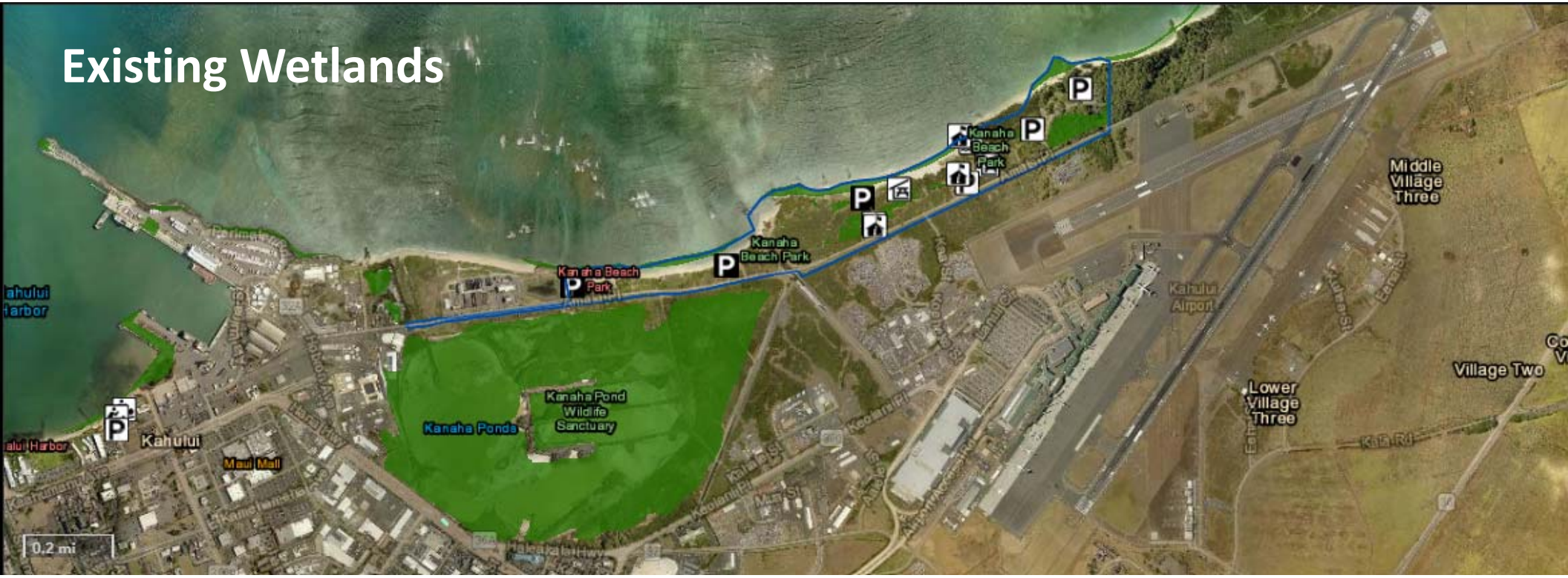
Kanahā Beach Park

a case for adaptation planning, interagency coordination, and investment

Kanahā Beach Park



Kanahā Beach Park



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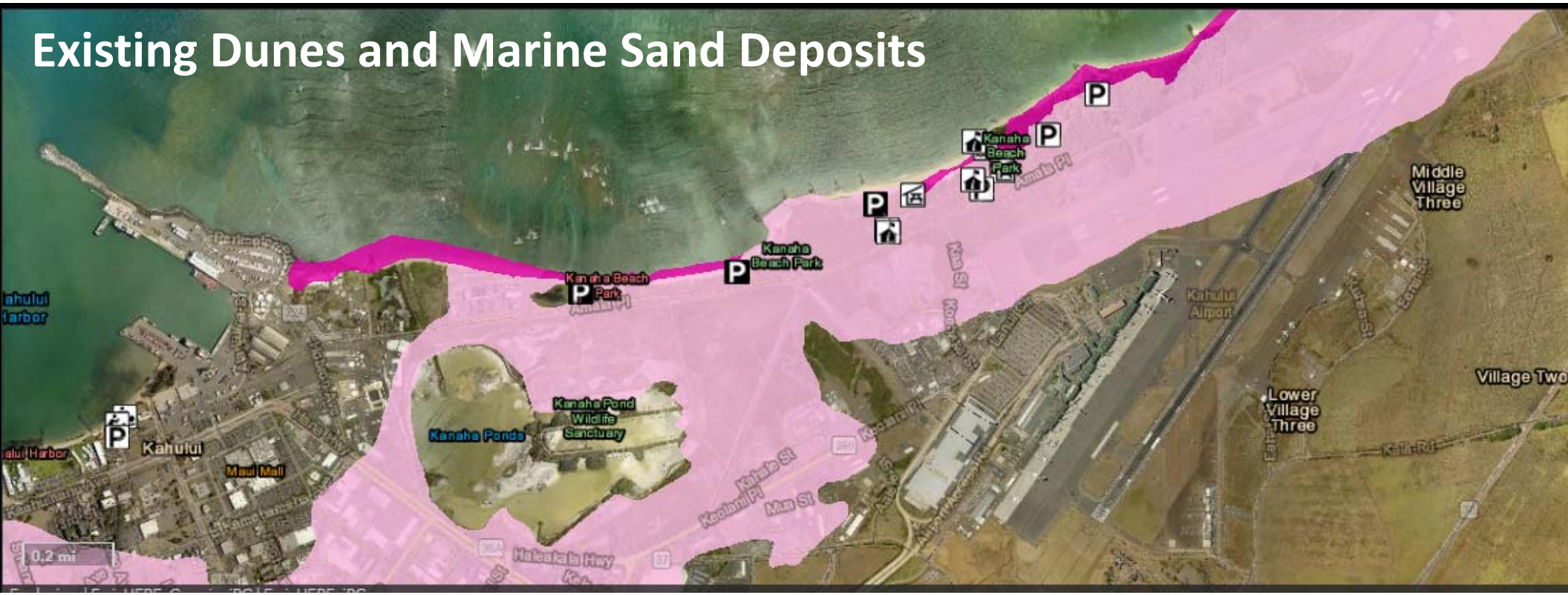

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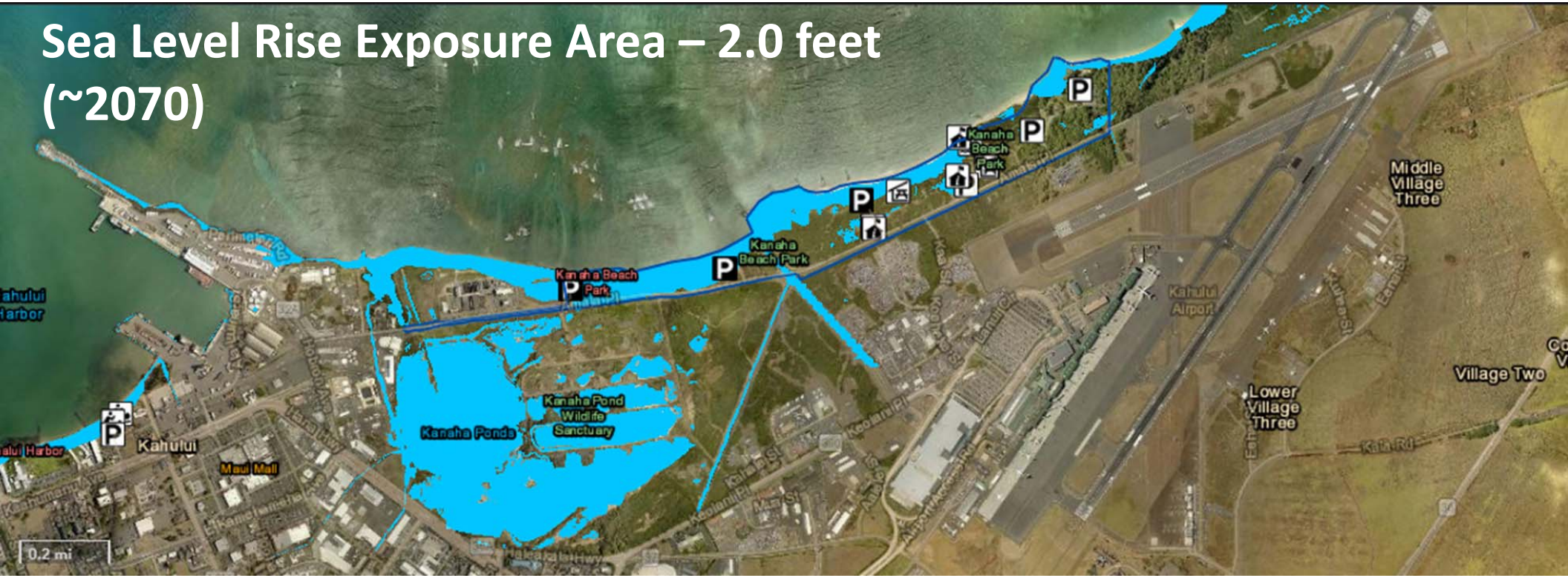

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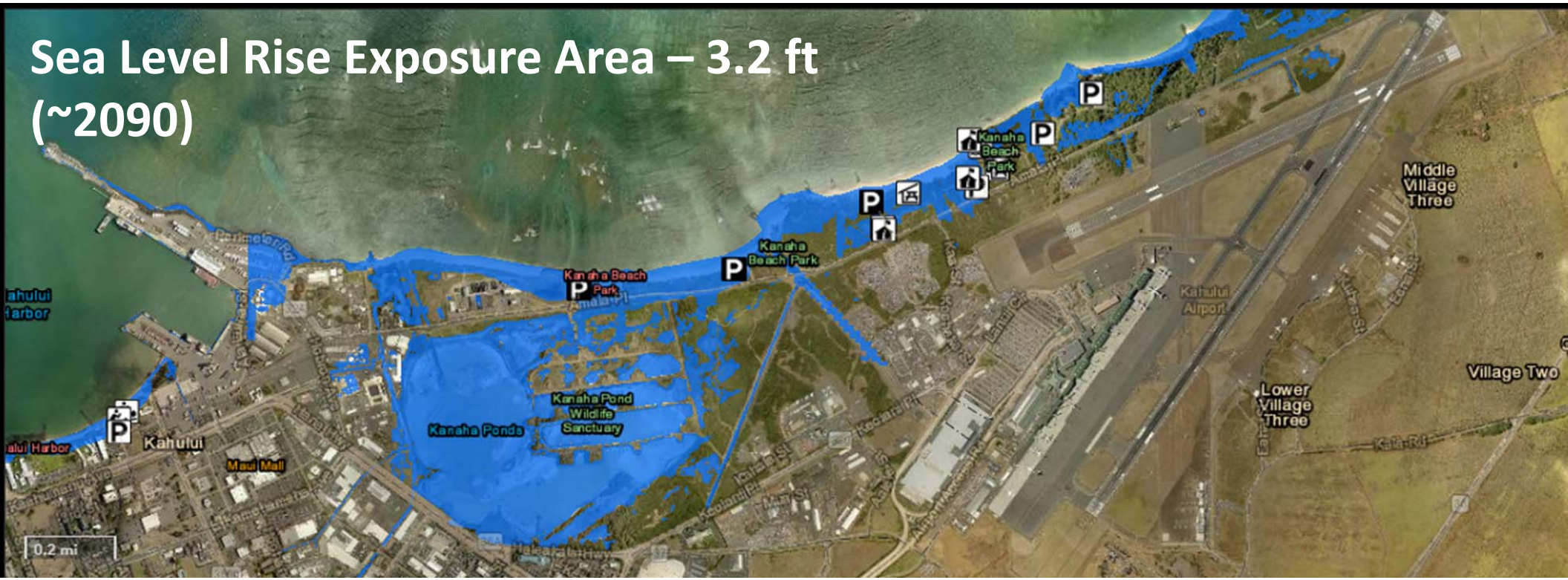

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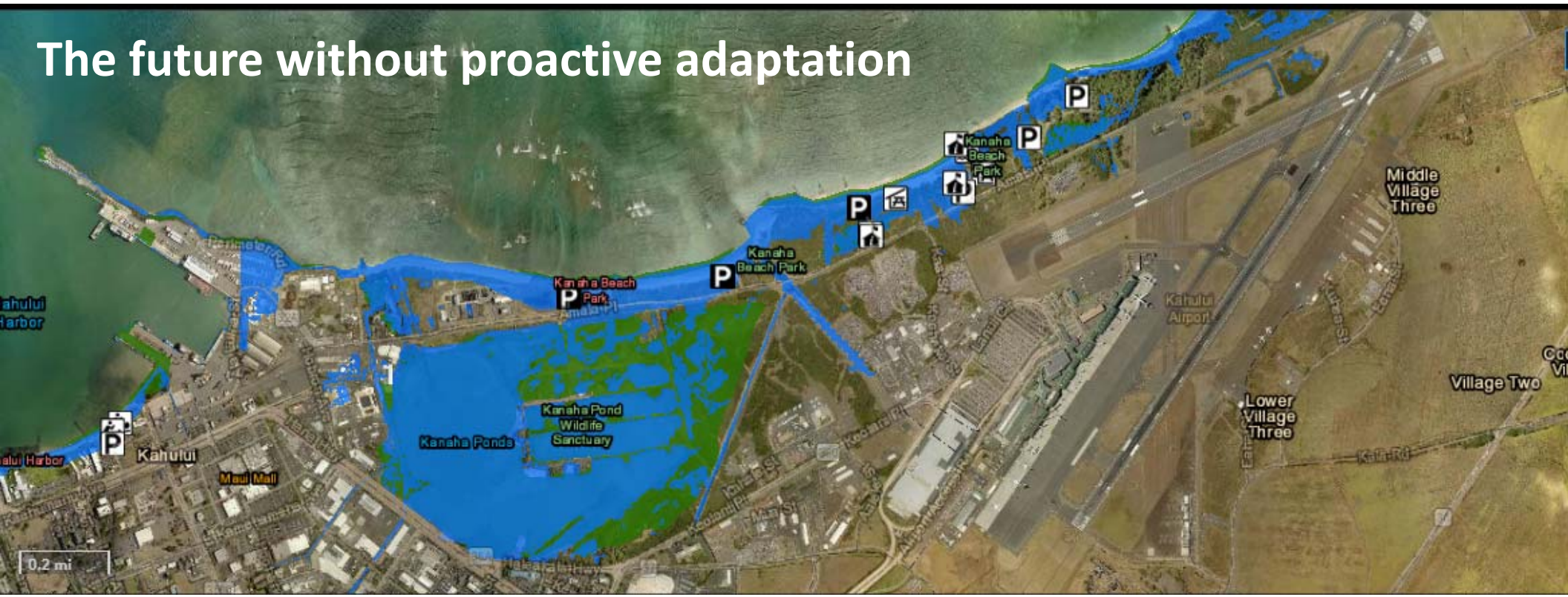


Kanahā Beach Park *VULNERABILITY ASSESSMENT RESULTS*

Med **Park Adaptation Potential**
Park has medium potential to withstand impacts of sea level rise based on five indicators of vulnerability.

Park Adaptation Potential based on Five Vulnerability Indicators

Percent of park area in SLRXA-3.2 (~2070): **61%**
Adaptation Potential: **Low**

A measure of park area exposed to chronic coastal flooding and land loss with 3.2 feet of sea level rise. The Sea Level Rise Exposure Area (SLRXA) is based on projections of passive inundation, erosion, and annual high wave run-up with sea level rise. The higher the percent area exposed the lower the adaptation potential.

Number of structures in SLRXA-2.0 (~2050): **4**
Adaptation Potential: **Med**

A measure of the number of structures, parking lots and major upright structures, in the park such as pavilions and restrooms exposed in the SLRXA with 2.0 feet of sea level The higher the number of structures exposed the lower the adaptation potential.

Miles of road in SLRXA-3.2 within a 0.5 mile-park buffer: **0.8**
Adaptation Potential: **Med**

A measure of the miles of highway and roads exposed to chronic coastal flooding and land loss with 3.2 feet of sea level rise. The higher the number of miles of road exposed the lower the adaptation potential.

Percent of park area with sand and dunes: **94%**
Adaptation Potential: **High**

A measure of the availability of sand and dune material to facilitate landward beach migration and sustainability with sea level rise and provide coastal protection services. The higher the percentage of park area with sand and dunes the higher adaptation potential.

Difference in percent of area in SLRXA-3.2 and SLRXA-2.0: **23%**
Adaptation Potential: **Med**

A measure of the ti ming of exposure of the park to two sea level rise projections. The lower the difference in % area between the two projections the lower the adaptation potential rating as sea level rise impacts are projected to occur earlier (~2050).

Additional Indicators to Support Planning and Decision-Making

Percent of the park area within the 1%CFZ-3.2: **95%**

Measures of park exposure to severe event-based flooding:
- *Storm surge: 1%-Annual-Chance Coastal Flood Zone (1%CFZ) modeled with 3.2 feet of sea level rise*

Percent of park area in FIRM Flood Zone A: **5%**

Measures of park exposure to severe event-based flooding:
- *Riverine flooding: 1%-Annual-Chance Flood Zone based on historical data (Flood Insurance Rate Map (FIRM) Zone A).*

Is park adjacent to federally designated critical terrestrial habitat for monk seals? **No**

The critical terrestrial habitat for the Hawaiian monk seal extends 5 m inland from the shoreline. This habitat is expected to migrate landward as sea level rise.

FUTURE CONDITIONS

Assessment of near-term and medium-term exposure and impacts of sea level rise on park assets based on five indicators

ADAPTATION POTENTIAL

Rating of each park's potential for adaptation to sea level rise based on the assessment of future conditions for all 65 parks

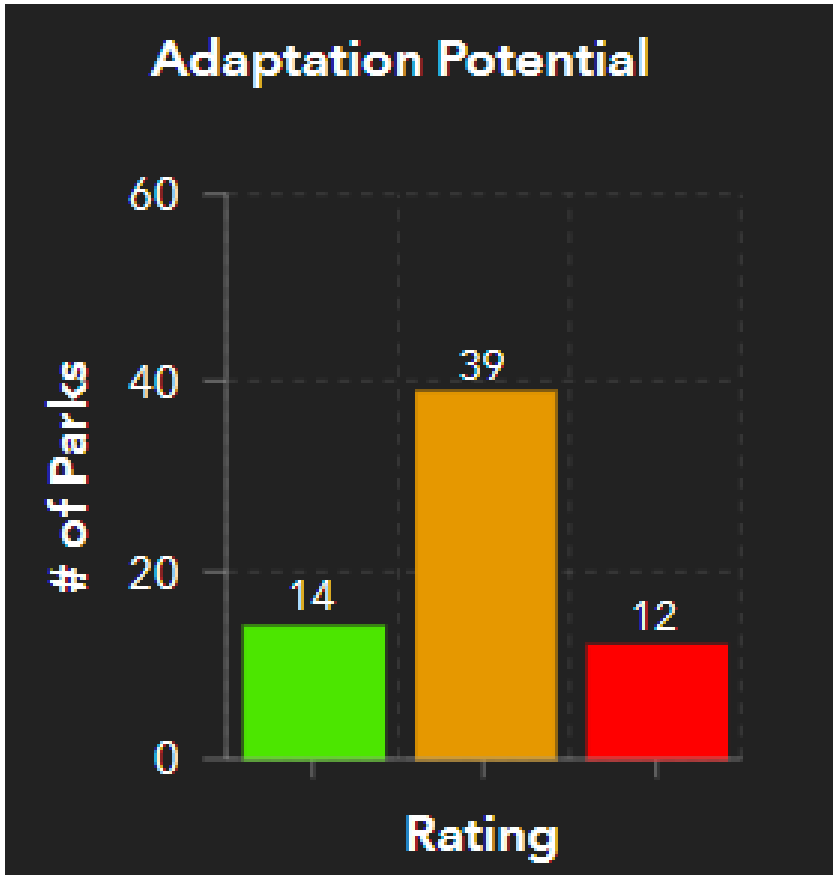
- HIGH
- MEDIUM
- LOW

ADAPTATION STRATEGIES

Adaptation strategies based on future conditions, adaptation potential, and other factors

- Assess park viability based on future access
- **RESTORE DUNES AND/OR PRESERVE WETLANDS**
- Retreat/acquire land and relocate structures
- Fortify/raise shoreline revetment
- Maintain shoreline access only
- Maintain facilities/monitor conditions

County-wide Results: Adaption Potential



Of the 65 parks in the study:

- 12 parks rated as Low Adaptation Potential
- 8 of the Low Adaptation parks are in West Maui

County-wide: Adaption Strategies

Of the 65 parks in the study:

- 20 parks — Maintain facilities and monitor conditions
- 16 parks — Assess park viability based on future access
- 12 parks — Restore dunes and/or preserve wetlands
- 8 parks — Maintain shoreline access only
- 6 parks — Retreat/acquire land and relocate structures
- 3 parks — Fortify/raise shoreline revetment

DRAFT Policies

- **Protect public safety** by removing park structures and features damaged or exposed by severe coastal flooding and storm events
- **Apply cultural protocols** for adaptation actions
- **Prioritize nature-based adaptation that restore coastal ecosystems and maintain ocean dependent uses**
- **Limit construction** of new facilities exposed to 3.2 feet of sea level rise
- **Retain undeveloped park land** outside hazard areas for future parks
- **Coordinate with county and state agencies** on adaptation planning

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Web Application for Public and Staff

- **Inform public about coastal threats to Maui County beach parks and DPR actions.**
- **Use by DPR staff for planning CIP projects as well as maintenance and renovation activities.**

COUNTY OF MAUI
BEACH PARK VULNERABILITY STUDY

Project Overview

STUDY OBJECTIVES

Assess vulnerability of parks to coastal hazards and sea level rise

Determine the potential for each beach park to adapt to future conditions.

Develop a prioritization framework for investments in park infrastructure

Recommend policies, strategies, and actions to address the short and long term impacts of climate change.

Project Overview

INDICATORS USED TO ASSESS EXPOSURE AND POTENTIAL IMPACTS OF SEA LEVEL RISE ON PARK ASSETS

% of park area in SLRXA-3.2 (~2070)

Number of facilities in SLRXA-2.0 (~2050)

Miles of road in SLRXA-3.2 within a 0.5 mile-park buffer

% of park area with sand and dunes

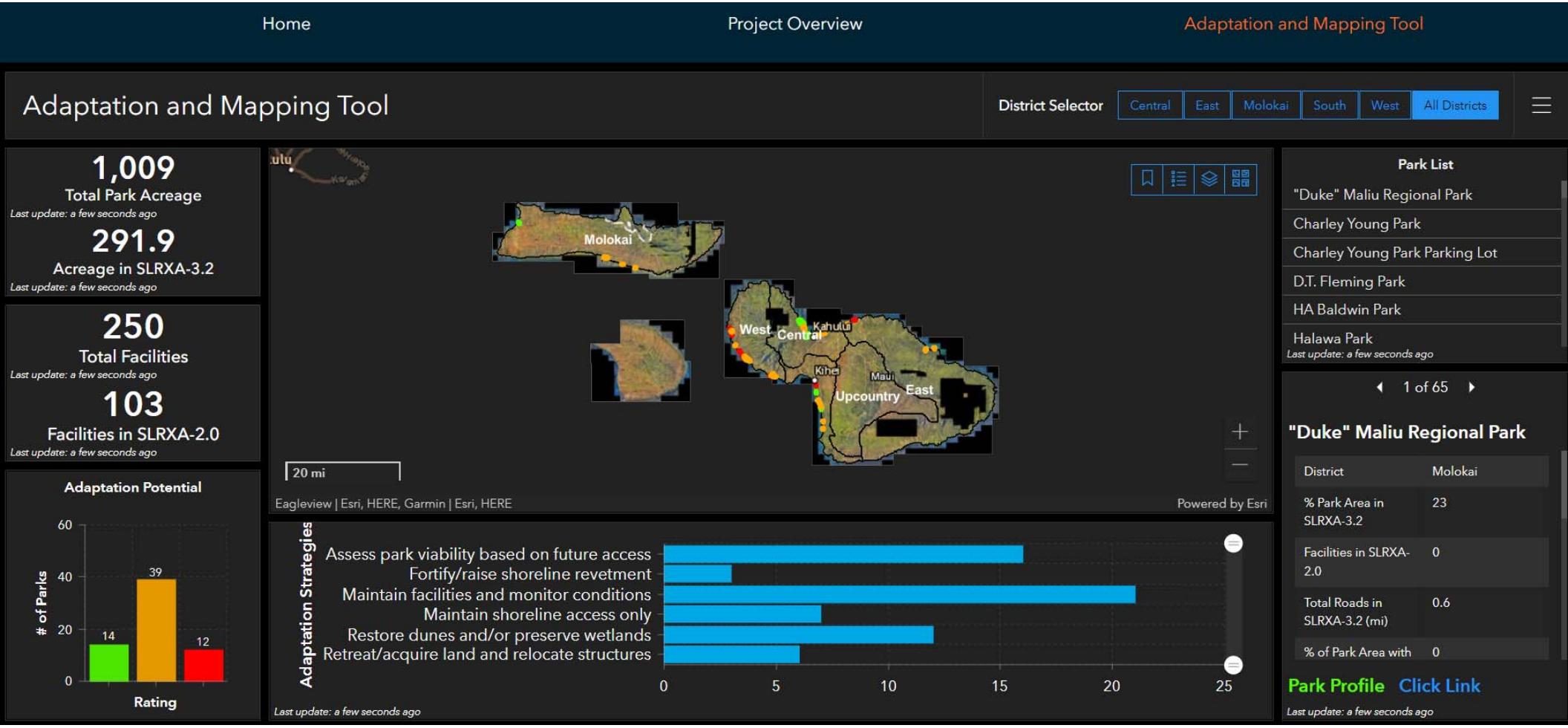
Difference in % of park area in SLRXA-3.2 and SLRXA-2.0

ADDITIONAL INDICATORS TO CONSIDER IN PLANNING DECISIONS

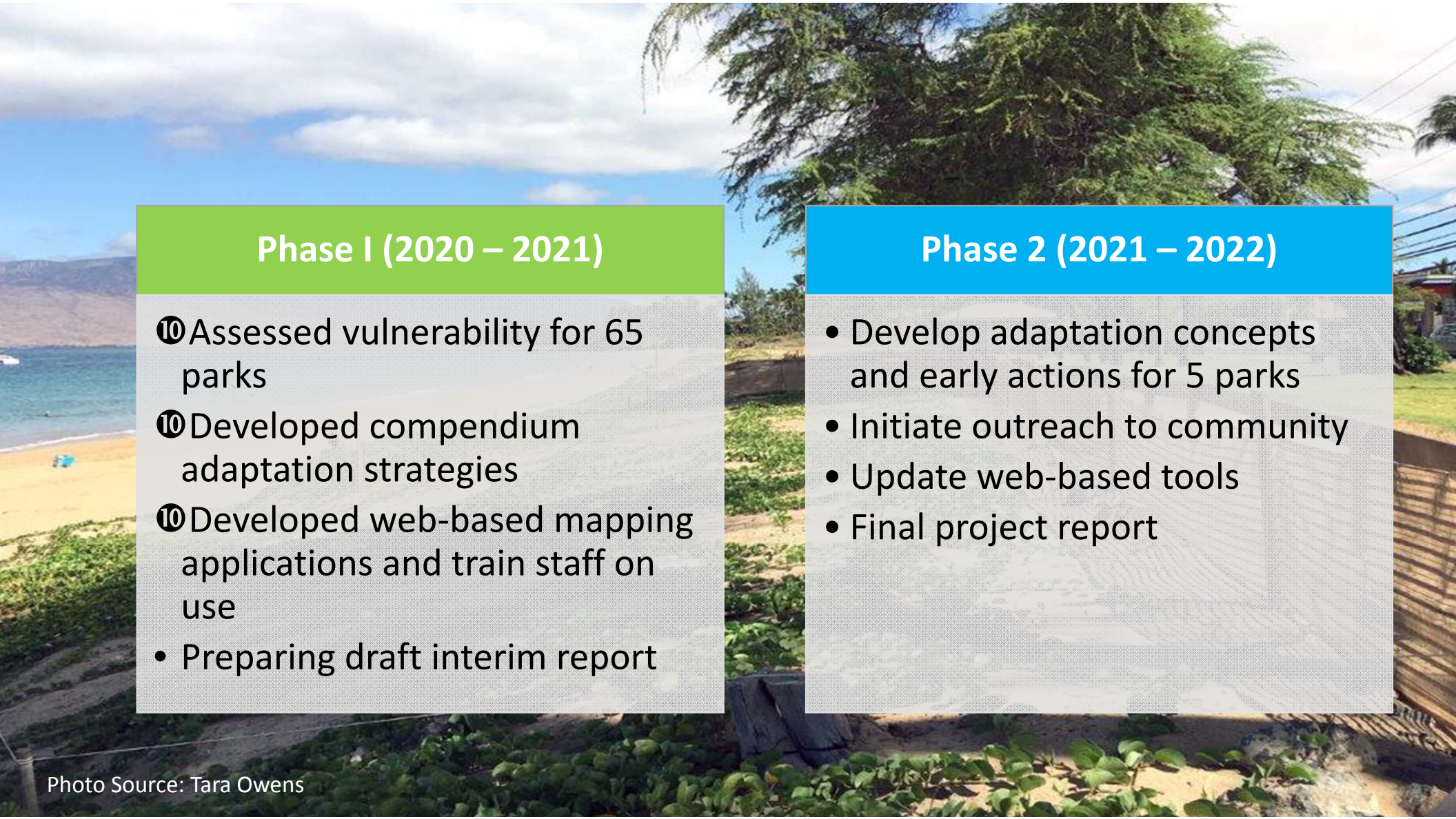
Percent of the park area within 1%CFZ-3.2

Percent of park area within the FEMA FIRM Zone A

Park is adjacent to federally designated critical terrestrial habitat extends 5 m inland from shoreline and will migrate landward as sea level rises


Home
Project Overview
Adaptation and Mapping Tool
Adaptation and Mapping Tool
District Selector
Central
East
Molokai
South
West
All Districts
1,009
Total Park Acreage
Last update: a few seconds ago
291.9
Acreage in SLRXA-3.2
Last update: a few seconds ago
250
Total Facilities
Last update: a few seconds ago
103
Facilities in SLRXA-2.0
Last update: a few seconds ago
Adaptation Potential
60
40
20
0
# of Parks
39
14
12
Rating
Molokai
West
Central
Kahului
Kihei
Maui
Upcountry
East
20 mi
Eagleview | Esri, HERE, Garmin | Esri, HERE
Powered by Esri
Adaptation Strategies
Assess park viability based on future access
Fortify/raise shoreline revetment
Maintain facilities and monitor conditions
Maintain shoreline access only
Restore dunes and/or preserve wetlands
Retreat/acquire land and relocate structures
0
5
10
15
20
25
Last update: a few seconds ago
Park List
"Duke" Maliu Regional Park
Charley Young Park
Charley Young Park Parking Lot
D.T. Fleming Park
HA Baldwin Park
Halawa Park
Last update: a few seconds ago
1 of 65
"Duke" Maliu Regional Park
District
Molokai
% Park Area in SLRXA-3.2
23
Facilities in SLRXA-2.0
0
Total Roads in SLRXA-3.2 (mi)
0.6
% of Park Area with
0
Park Profile
Click Link
Last update: a few seconds ago


Home
Project Overview
Adaptation and Mapping Tool
Adaptation and Mapping Tool
District Selector
Central
East
Molokai
South
West
All Districts
100
Total Park Acreage
Last update: a minute ago
61.1
Acreage in SLRXA-3.2
Last update: a minute ago
12
Total Facilities
Last update: a minute ago
4
Facilities in SLRXA-2.0
Last update: a minute ago
Adaptation Potential
60
40
20
0
# of Parks
1
Rating
0.2 mi
Eagleview | Esri, HERE, Garmin, iPC | Esri, HERE, iPC
Powered by Esri
Kanaha Beach Park
Adaptation Strategies
Restore dunes and/or preserve wetlands
0.9
1
1
1.1
1.1
Last update: a minute ago
Park List
Kamaole Point
Kamehameha Brick Palace
Kamehameha Iki
Kanaha Beach Park
Kaonoulu Park
Kaunakakai Lighthouse Park
Last update: 3 minutes ago
Kanaha Beach Park
District
Central
% Park Area in SLRXA-3.2
61
Facilities in SLRXA-2.0
4
Total Roads in SLRXA-3.2 (mi)
0.8
% of Park Area with Sand and Dunes
94
Park Profile
Click Link
Last update: a minute ago



Phase I (2020 – 2021)

- ✅ Assessed vulnerability for 65 parks
- ✅ Developed compendium adaptation strategies
- ✅ Developed web-based mapping applications and train staff on use
- Preparing draft interim report

Phase 2 (2021 – 2022)

- Develop adaptation concepts and early actions for 5 parks
- Initiate outreach to community
- Update web-based tools
- Final project report

Photo Source: Tara Owens

Near-Term Priorities

Beach Park Adaptation Fund to support:

- **Public safety** by removing structures and features likely to be affected by high waves and coastal erosion in the near term
- **Adaptation plans, feasibility studies, and engineering designs** for one third of the parks that require active adaptation
- **Cultural site preservation** by developing park-specific cultural protocols with cultural practitioners and lineal descendants

Mahalo


Coastal Sand Dunes
A Natural Protection
Shifting Sands
Sand dunes play an important role in protecting the shorelines and providing habitat for many of the unique plants and animals found in Hawai'i. Coastal erosion is a natural process; the dynamic nature of shorelines can be observed in the annual retreat and recovery of many beaches. Inappropriate land use practices and shoreline development, combined with rising sea levels accelerate beach loss. Healthy coastal dunes contribute to the seasonal fluctuation by releasing sand and helping to maintain beaches.
Naupaka · Scaevola sericea
Native
Akia · Wikstroemia uva-ursi
Native
Pōhuehue · Ipomea pes-caprae subsp. brasiliensis · Native
'Aki'aki · Sporobolus virginicus
Native
Photography by Forest & Kim Starr
Please Kōkua
Visitors can help restoration by staying off the dunes, keeping on the marked pedestrian trails or on the beach to avoid trampling the sensitive vegetation and joining us in our restoration efforts. Absolutely no bicycles or motorized vehicles are allowed.
Restoration
Reducing human foot traffic and replanting native plants contribute to the healthy restoration of this important dune habitat. Removal of invasive plants such as ironwood trees also contributes to the restoration process.
Why the Boardwalk?
This raised boardwalk helps keep foot traffic off the dunes, protecting vegetation, keeping sand in place and allowing the dunes to grow.