



2 SEPTEMBER 2025

Sea Level Rise Adaptation Alternatives

Seacliff & New Brighton State Beaches



WAGGONNER
& BALL



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Seacliff & New Brighton State Beaches

Context Map



Five Project Sub-Areas

Site Map



HIGHWAY 1

New Brighton
State Beach

Seacliff State Beach
RV Campground

Seacliff State Beach
Day-Use Area

Rio Del Mar
State Beach

Platforms at Rio Del
Mar State Beach

PACIFIC OCEAN



Adaptation Approach

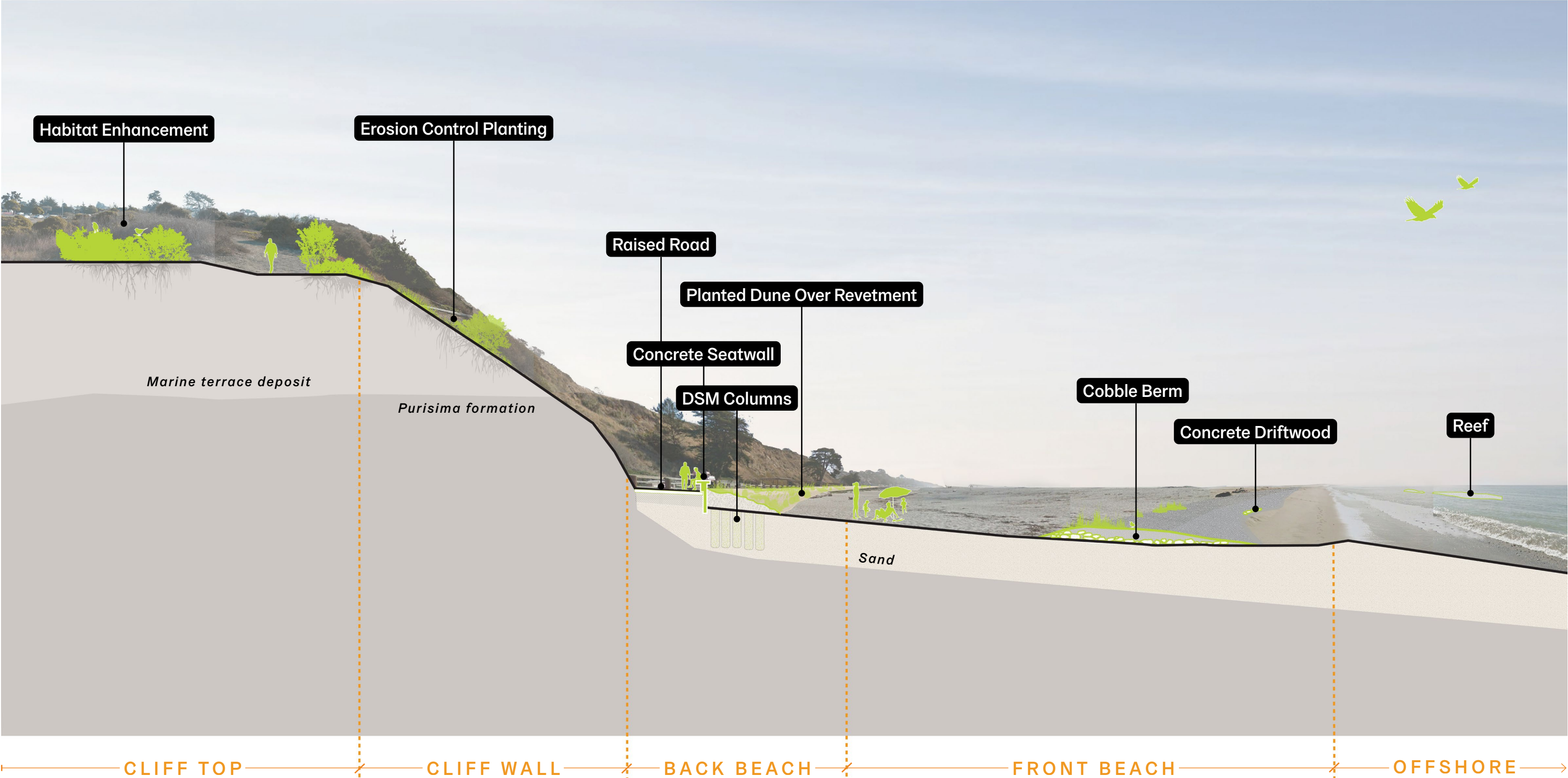


- **Adapt** park assets to sea level rise
- Preserve and enhance **natural resources** in the Parks
- Maintain access to **recreational opportunities**

- Understand **coastal hazards** and change over time with sea level rise
- Identify **vulnerabilities** of State Parks assets and natural resources
- Develop conceptual **adaptation alternatives** recommended by specialists
- Evaluate feedback from Parks staff, regulatory agencies, and the public and select a **preferred adaptation pathway**

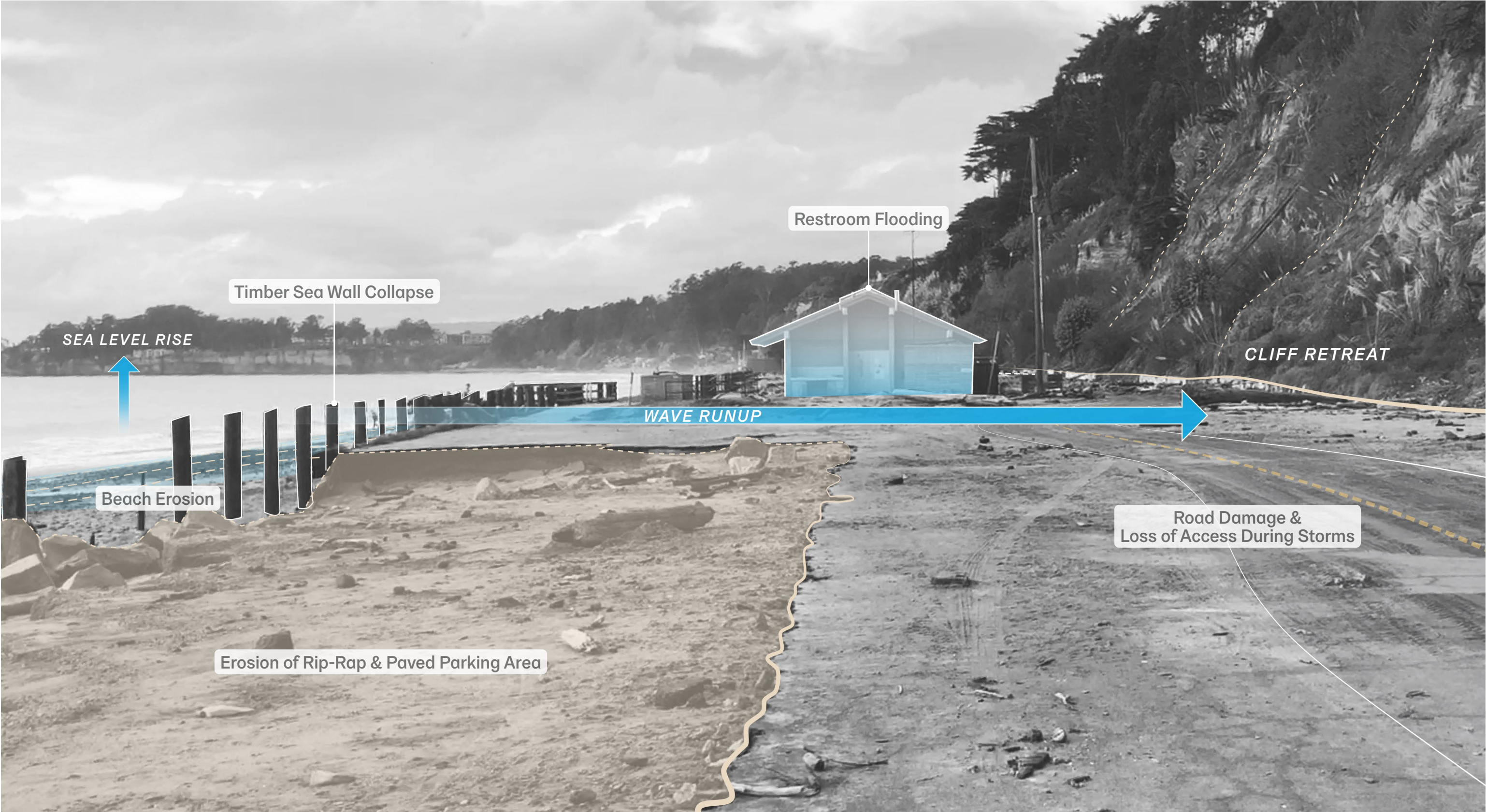
Adaptation Measures

Measures are suited to specific coastal zones



A Future with No Action

Seacliff RV Campground after January 2023 storms



Actionable Alternatives

Adaptation will require re-envisioning assets currently concentrated on back beach



Fortify &
Protect

Restore &
Relocate



GREY INFRASTRUCTURE

HYBRID SOLUTIONS

GREEN INFRASTRUCTURE

Fortify & Protect Strategy

- Prioritizes securing existing infrastructure and assets in place
- Relies on grey infrastructure
- Example adaptation measures: concrete seawalls, seatblocks, DSM columns, elevated assets



Seat blocks
Coyote Point, San Mateo, CA

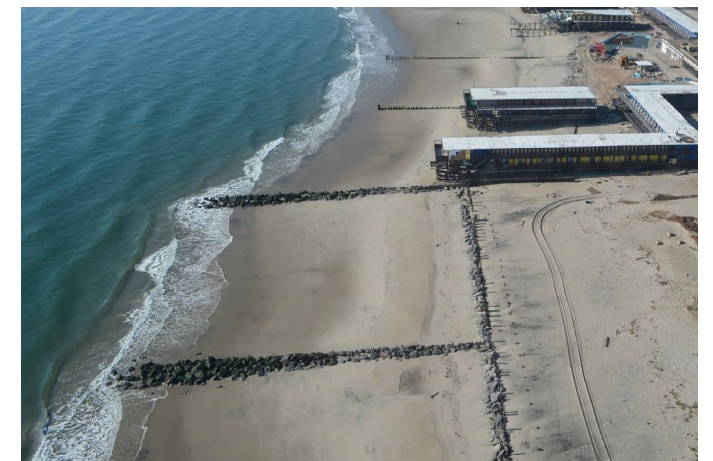


Concrete promenade and rock revetment
Puerto Vallarta



Fortified shoreline designed for public access

Cliff stabilization



Rock groins

Restore & Relocate Strategy

- Prioritizes **natural resource restoration**
- Relocates assets to make room for **coastal processes**
- Example adaptation measures: assets relocated inland, native planting, increased sandy beach habitat

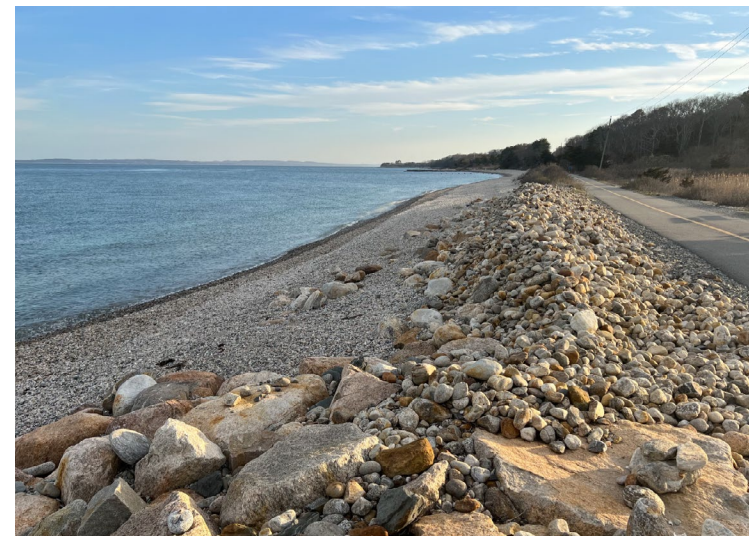
Fenced dunes (promote sand retention and deter foot traffic)



Sandy beach habitat



Dune & native grass planting



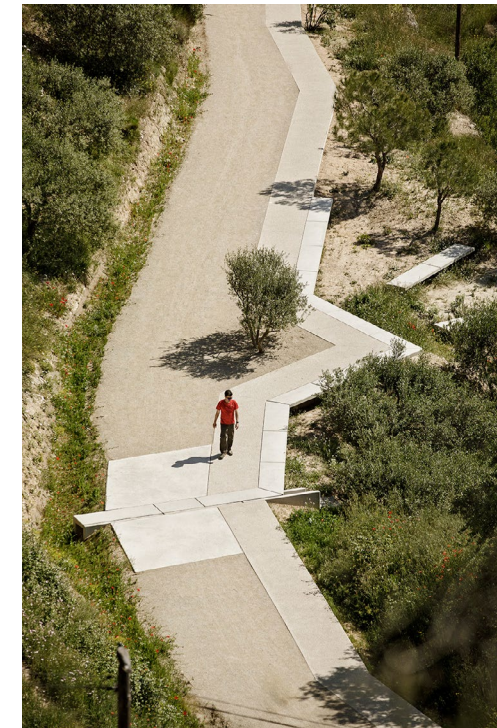
Cobble berm

Hybrid Strategies

- Harmonizes maintaining assets and making room for coastal processes
- Utilizes both green and grey infrastructure
- Example adaptation measures: native planting, cobble berms, consolidated assets, dunes



Dunes & boardwalks (integrate NBS and visitor assets)



Dune Typologies



Dunes provide habitat benefits and can provide an additional buffer for assets from wave action; however, they can fluctuate as beach levels change and are erodable. Dunes will require maintenance and replanting to be sustained. For this reason, dunes are only proposed in the hybrid strategy of each conceptual adaptation alternatives--a middle ground between fortifying infrastructure in place and removing and relocating it.

Across the five project sub-areas, beach width and thus vulnerability to wave action varies. To test options and construction methods of dunes, a different typology is suggested at each project sub-area.

- New Brighton State Beach is the most narrow site. No dunes are proposed in the conceptual adaptation strategy for this site.
- At the Seacliff RV Campground & Day Use Area, dunes with a stabilized core or leading edge are proposed. The materiality of this stabilized material will be determined in geotechnical and design phases of work.
- At Rio Del Mar, the ongoing Living Shoreline Planting Project includes angled timber buried under native planting. This is the proposed typology in the adaptation alternative, as well as the addition of cobble berms on the waterside of the planting, to protect from waves and the forces of water at the Aptos Creek outfall.
- At Platforms, the wide beach allows testing of a dune field, a larger, layered area of dune planting.

Seacliff RV Campground & Day Use Area
Stabilized Core or Leading Edge



Rio Del Mar at Aptos Creek
Buried Timber & Cobble Berm

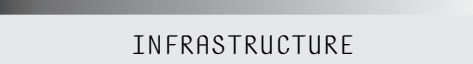
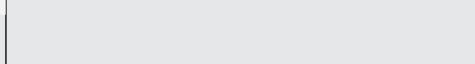


Rio Del Mar at Platforms
Dune Field



GREEN INFRASTRUCTURE

In the future, as data improves and operations and management evolve, Parks can continue to adapt toward established goals with flexibility.

Planning Horizon	CURRENT	NEAR-TERM	MID-TERM	LONG-TERM
Time Frame	Now	By 2050	~2070	2100+
Sea Level Rise (ft)	0'	1'	2'	4-6'
Fortify & Protect				
Restore & Relocate				
Hybrid				

Coastal Hazards & Vulnerability



Coastal Hazards

Permanent Exposure

- Tidal inundation
- Sea level rise
- Shoreline retreat
- Cliff retreat



Coastal Hazards

Temporary Exposure

- Coastal storm flooding
- Wave run-up
- Beach erosion
- Stormwater runoff



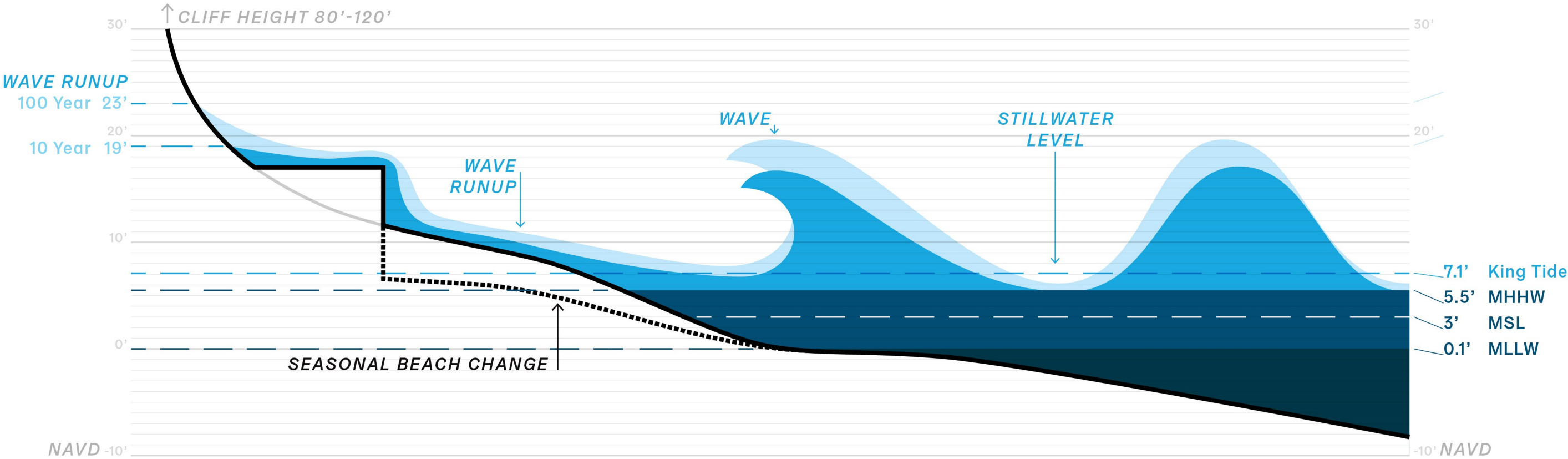
Repetitive Loss

January 2023 Storm Damage, Image by Nick Zimnicki



Current Water Levels

Seacliff & New Brighton State Beaches



Sea Level Rise Projections & Planning Targets

No Regrets Planning

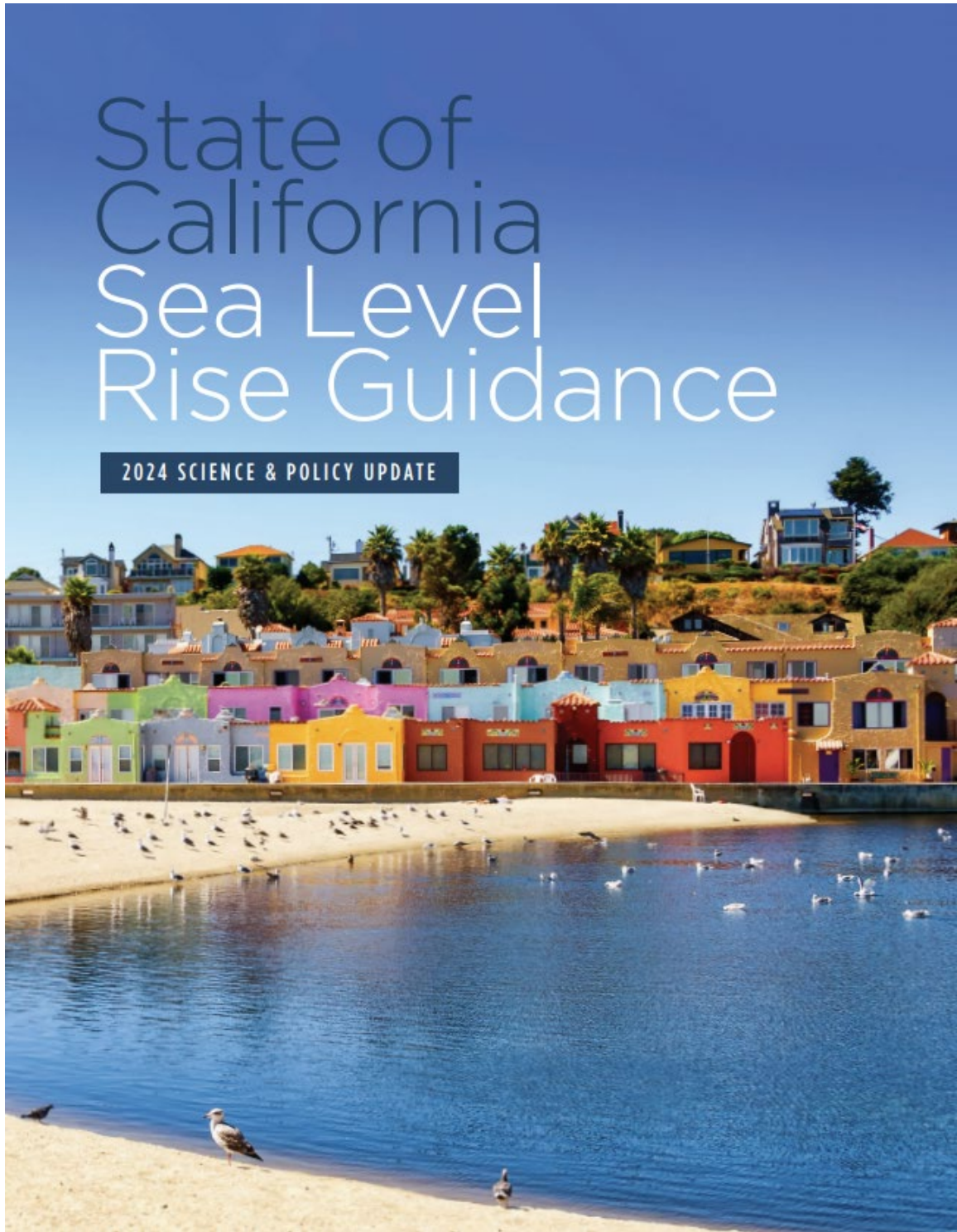
In June 2024, the Ocean Protection Council of California released updated Sea Level Rise Guidance. Based on observed sea level rise between 2000 and 2024, projections for future sea level rise are updated and precision has increased.

In the near future, the intermediate sea level rise projection can be used to set planning targets for adaptation infrastructure--safe elevations for construction and timeframes for implementation.

Further into the future, the range of projections widens because variables and unknowns increase. To account for this variability, the intermediate-high projection is used in later planning targets.

The conceptual adaptation approaches proposed in this project focus on actions that can be taken now and over the next 25 years, in the "near-term," a planning target for which the appropriate amount of data and resources are available. As sea levels rise, hazards change the landscape, and the community develops, future adaptations can be conceptualized as needed. These alternatives feature actions that should be completed by a target date of 2050, and briefly evaluate next steps for the target dates of 2070 and end of century, 2100.

To ensure that planning and action progress in a way that does not limit future adaptations, the alternatives proposed here consider what those future adaptations may be. The goal is to create an understanding of the pathway forward and allow near-term planning to proceed.



2024 California State Guidance Published by the Ocean Protection Council



Statewide Averages for Five California Sea Level Scenarios

Median values for California Sea Level Scenarios, in feet, relative to a 2000 baseline. These statewide values all incorporate an average value of vertical land motion corresponding to a negligible rate of 0.1 mm (0.0003 ft) per year uplift. The California Sea Level Scenarios track closely with global mean sea level (GMSL), with differences of only 2 to 3 inches between GMSL and the California Sea Level Scenarios in 2100. Evaluation of the Intermediate, Intermediate-High, and High scenarios (outlined in red below) is recommended to inform appropriate sea level rise planning and project decisions.

YEAR	LOW	INT-LOW	INTERMEDIATE	INT-HIGH	HIGH
2020	0.2	0.2	0.2	0.2	0.3
2030	0.3	0.4	0.4	0.4	0.4
2040	0.4	0.5	0.6	0.7	0.8
2050	0.5	0.6	0.8	1.0	1.2
2060	0.6	0.8	1.1	1.5	2.0
2070	0.7	1.0	1.4	2.2	3.0
2080	0.8	1.2	1.8	3.0	4.1
2090	0.9	1.4	2.4	3.9	5.4
2100	1.0	1.6	3.1	4.9	6.6
2110	1.1	1.8	3.8	5.7	8.0
2120	1.1	2.0	4.5	6.4	9.1
2130	1.2	2.2	5.0	7.1	10.0
2140	1.3	2.4	5.6	7.7	11.0
2150	1.3	2.6	6.1	8.3	11.9

NOW

Near-Term

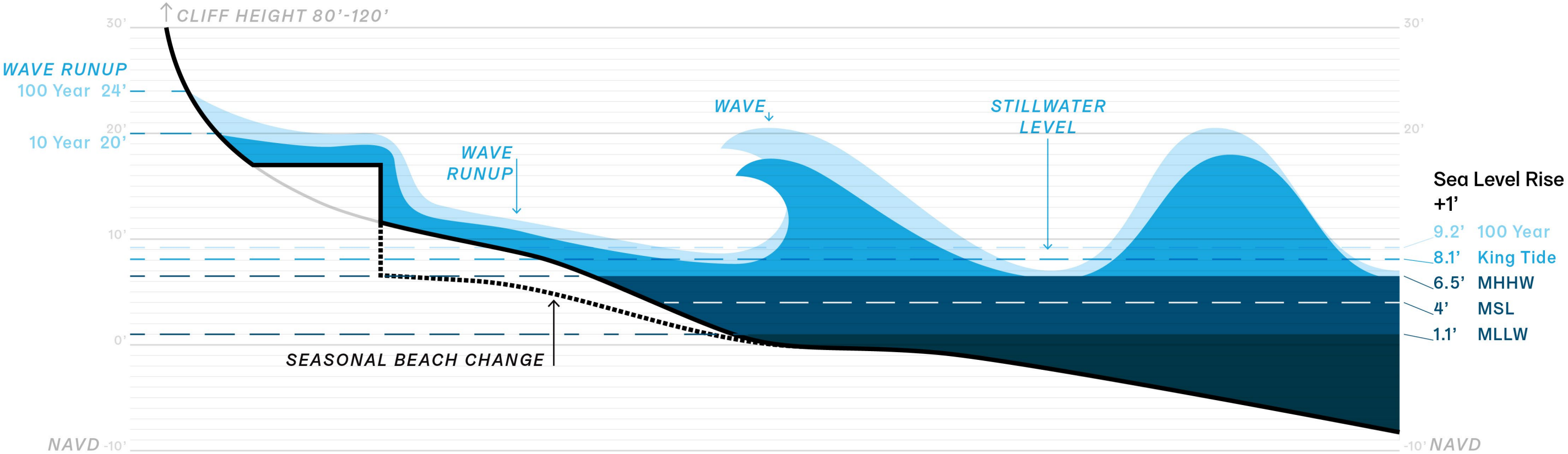
Mid-Term

Long-Term



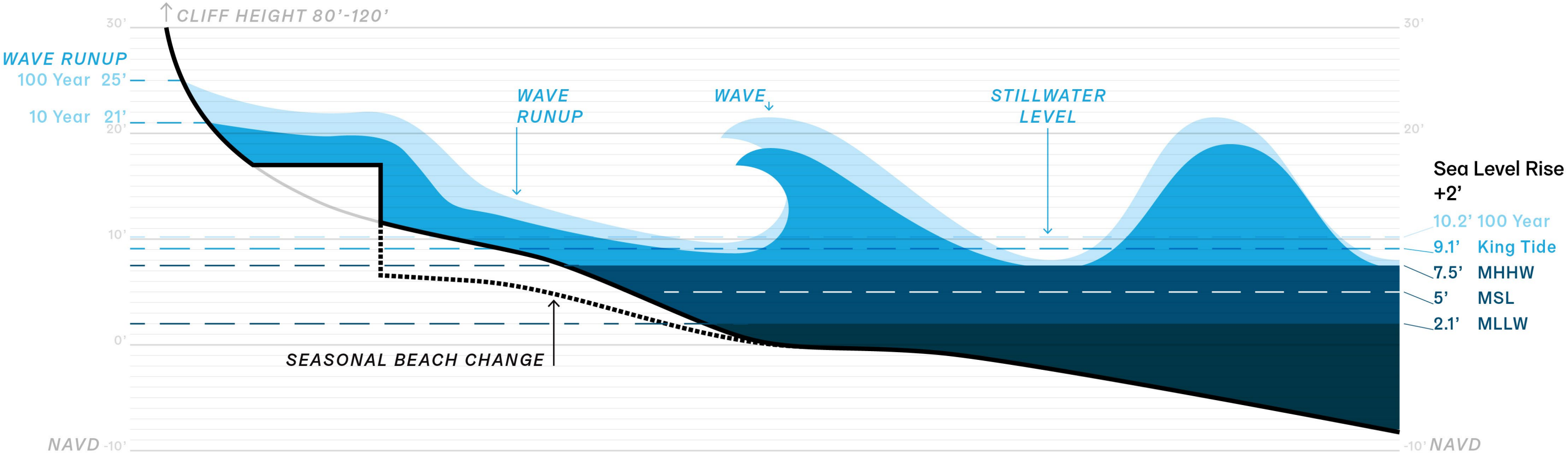
Coastal Storm Flooding & Wave Runup with 1 foot of Sea Level Rise

Near-Term Planning Horizon, by 2050



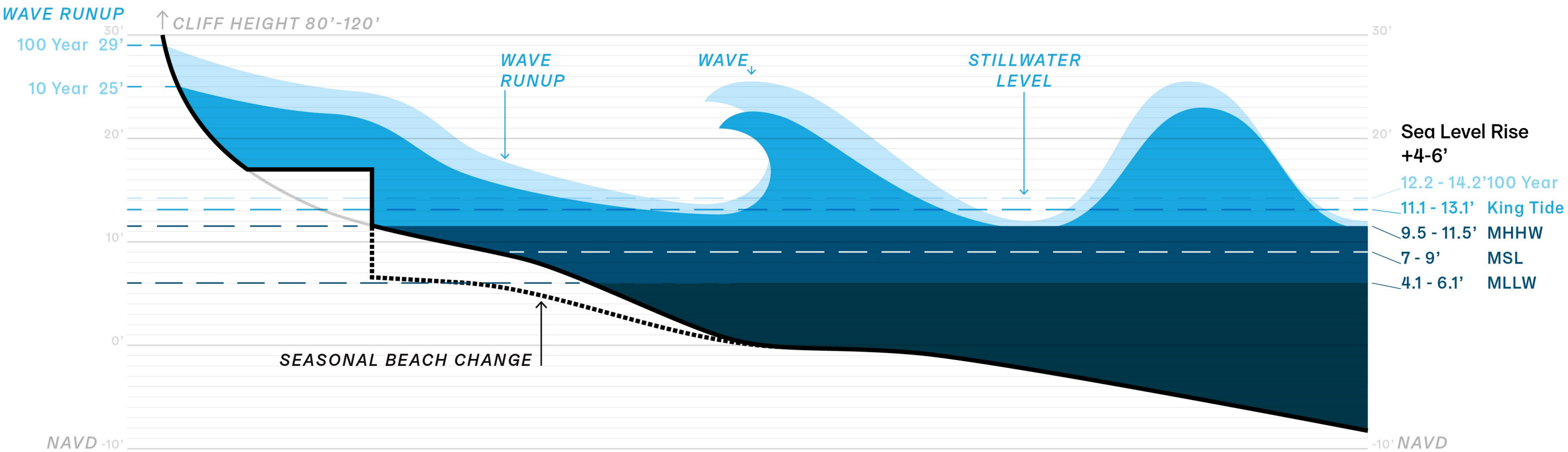
Coastal Storm Flooding & Wave Runup with 2 feet of Sea Level Rise

Mid-Term Planning Horizon, Approximately 2070



Coastal Storm Flooding & Wave Runup with 4-6 feet of Sea Level Rise

Long-Term Planning Horizon, 2100+

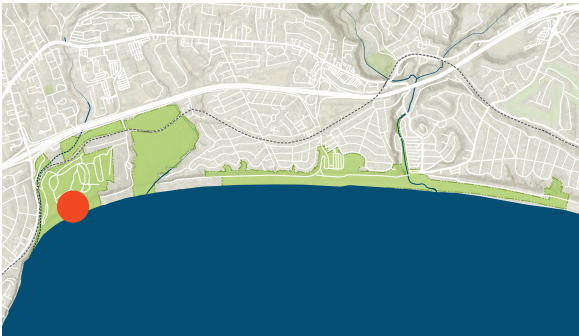


Coastal Storm Flooding at New Brighton

Now & Near-Term



- Legend**
- Current Daily Conditions
 - Current 10-Year Storm Impact
 - 10-Year Storm + 1' SLR
 - Park Boundary
 - Park Facility
 - Recreation Amenity
 - Public Access
 - Natural Resource Area



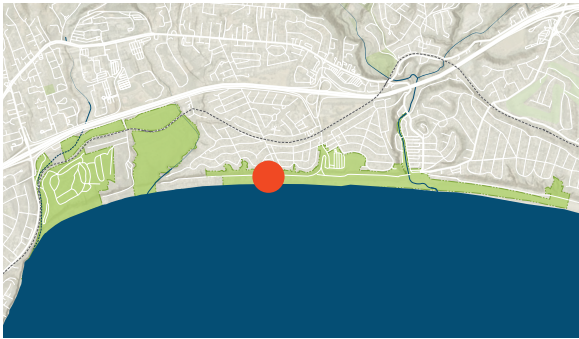
Coastal Storm Flooding at Seacliff State Beach RV Campground

Now & Near-Term



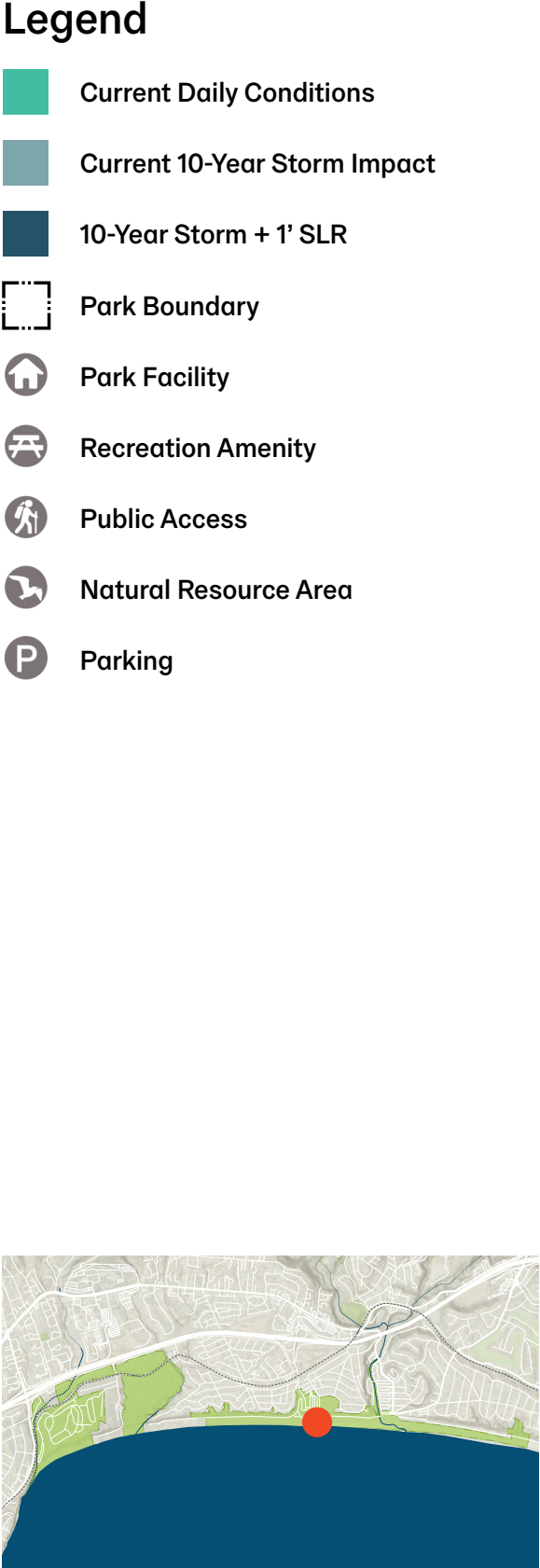
Legend

- Current Daily Conditions
- Current 10-Year Storm Impact
- 10-Year Storm + 1' SLR
- Park Boundary
- Park Facility
- Public Access
- Parking



Coastal Storm Flooding at Seacliff State Beach Day Use Area

Now & Near-Term



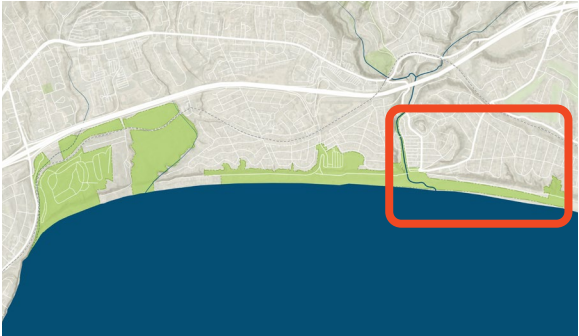
Coastal Storm Flooding at Rio Del Mar State Beach

Now & Near-Term



Legend

- Current Daily Conditions
- Current 10-Year Storm Impact
- 10-Year Storm + 1' SLR
- Park Boundary
- Park Facility
- Recreation Amenity
- Public Access



Shoreline & Cliff Retreat

Projected Rates Across all Sites

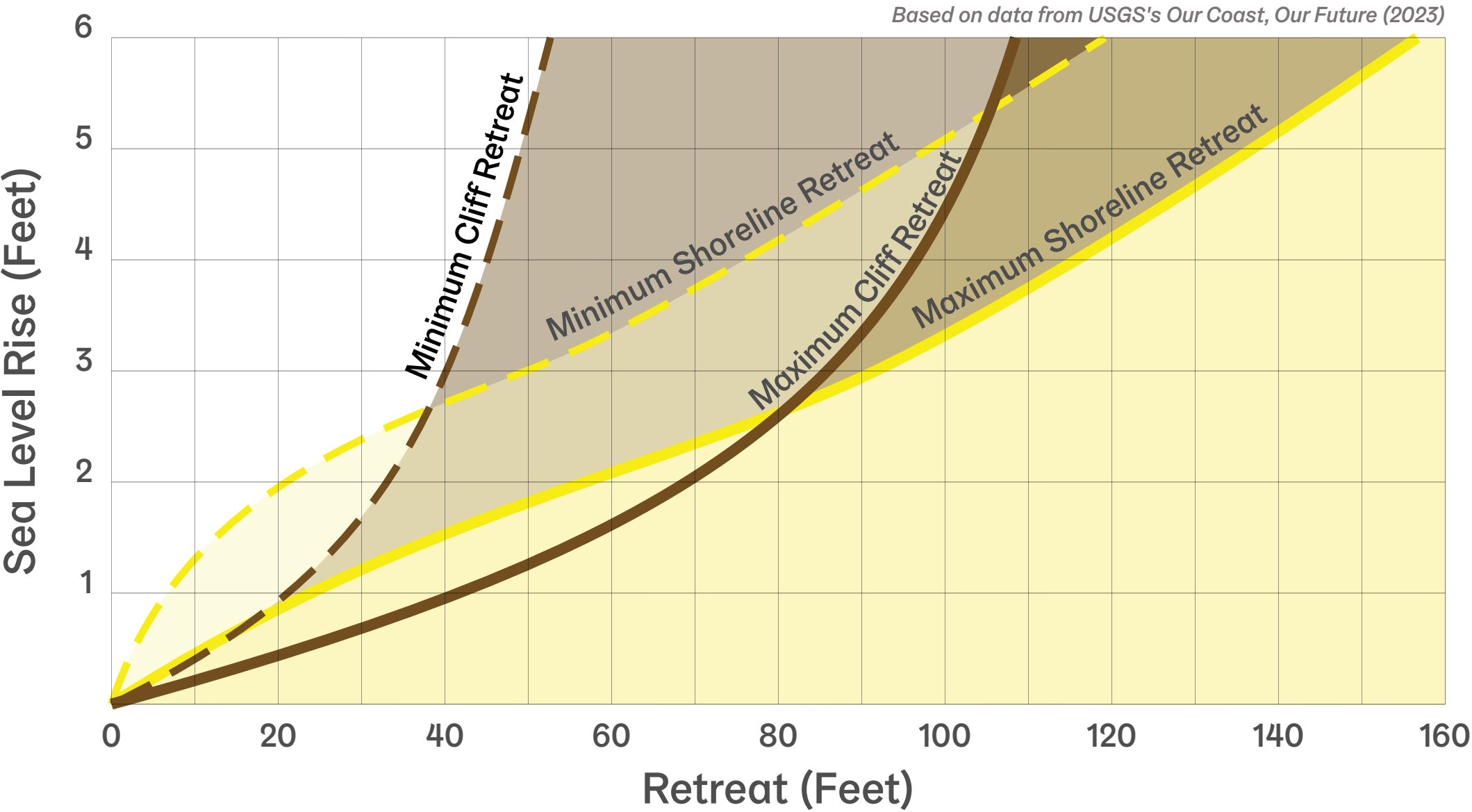


Shoreline Retreat is the gradual process of a beach narrowing due to water levels rising and temporary hazards like wave action and beach erosion occurring further inland. As the shoreline retreats at New Brighton, Seacliff, and Rio Del Mar State Beaches, assets concentrated on the back beach will become more vulnerable.

Cliff Retreat is the process of a cliff face moving inland due to these same coastal hazards as well as erosion from upland stormwater runoff. This happens gradually, but cliffs can reach a point of structural instability that results in a failure and collapse, damaging assets atop and at the base of the cliff.

Storm hazards and natural erosion processes compounded by sea level rise cause increased rates of shoreline and cliff retreat.

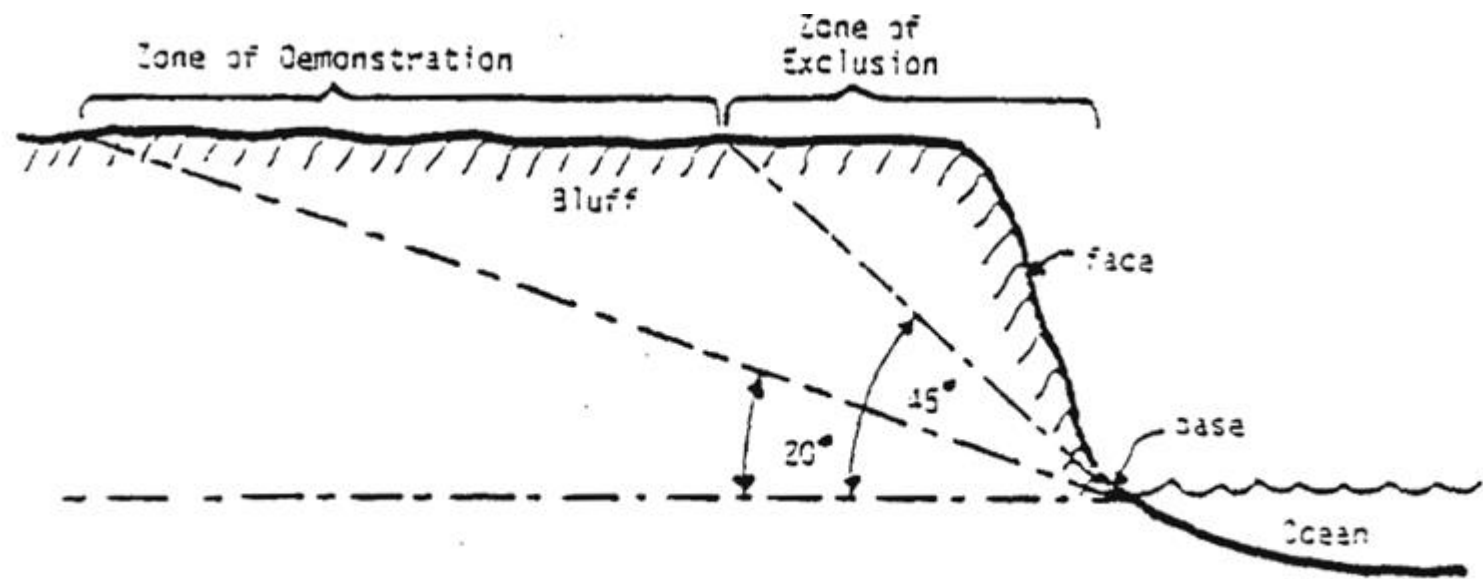
Shoreline change data for Monterey Bay developed by USGS and analyzed in the Seacliff & New Brighton State Beach Vulnerability Assessment by Moffatt & Nichol indicates that shoreline retreat is projected to happen slowly at first, and then steadily. Cliff retreat is projected to happen quickly at first, and then slowly.



Seacliff State Beach General Plan Cliff Retreat Guidance



The 1990 General Plan includes a geotechnical recommendation that there shall be "zone of exclusion" atop cliffs where assets should not be constructed. If cliffs retreat as they are projected to with no action to fortify or buffer the cliff from hazards, the recommended clifftop setback will also move inland.



Storm Intensity & Frequency: Tipping Points

Rare, big storms of today will be more common storms of the future as sea levels rise



The January 2023 storm was approximately a 20-25-year storm event.

Today, a 25-year storm happens approximately once every 25 years or has a 4% chance of occurring in any given year.

With one foot of sea level rise, the relative amount of damage caused by a given storm event of the same intensity will happen nearly twice as often, every 13 years or at a 7% chance in any given year.

Additional factors like El Niño and other climate change impacts will increase this frequency.

Wave Runup (ft, NAVD88)	Current Storm Recurrence Interval (yrs)	Equivalent Storm Damage Recurrence Interval (yrs) with Sea Level Rise (ft)				
		0'	1'	2'	4'	6'
+11.2	1-yr	1	1	1	1	1
+16.5	5-yr	5	4	3	1	1
+19.4	10-yr	10	8	6	4	2
+20.8	25-yr	25	13	9	5	3
+22.0	50-yr	50	28	15	7	4
+23.3	100-yr	100	56	31	10	6

Adaptation Alternatives



New Brighton State Beach



New Brighton
State Beach

Seacliff State Beach
RV Campground

Seacliff State Beach
Day-Use Area

Rio Del Mar
State Beach

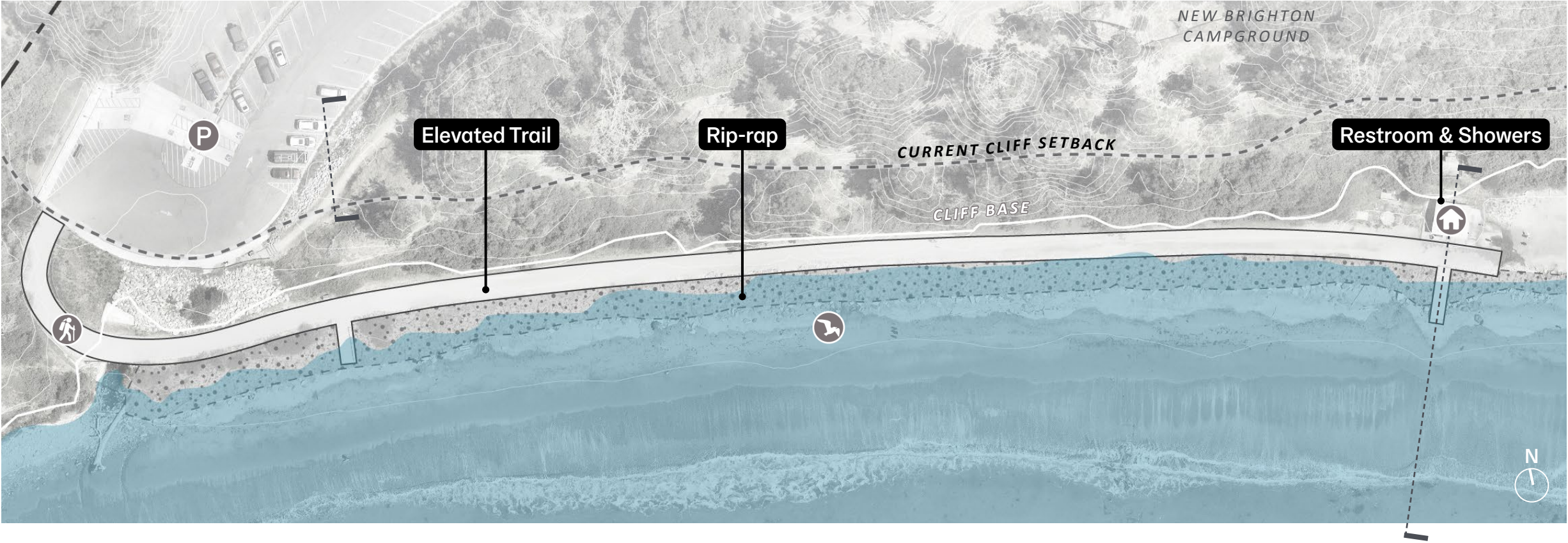
Platforms at Rio Del
Mar State Beach

PACIFIC OCEAN



Existing Conditions

New Brighton State Beach

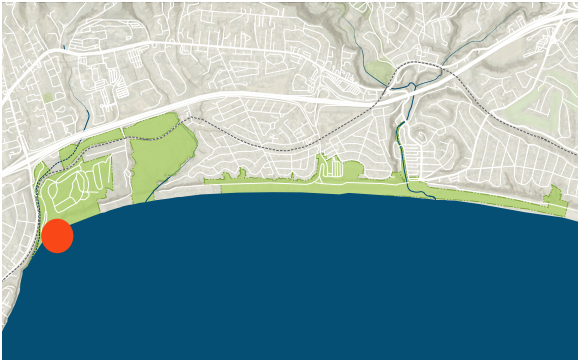
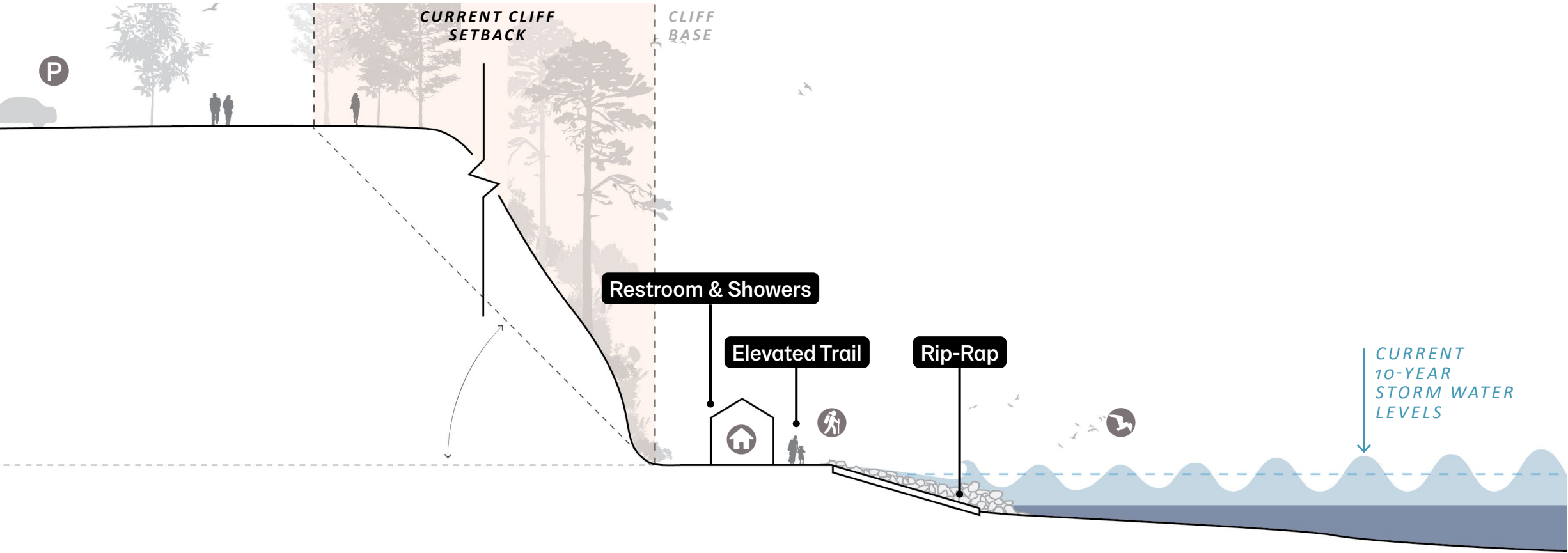


Legend

Current 10-Year Storm Water Level

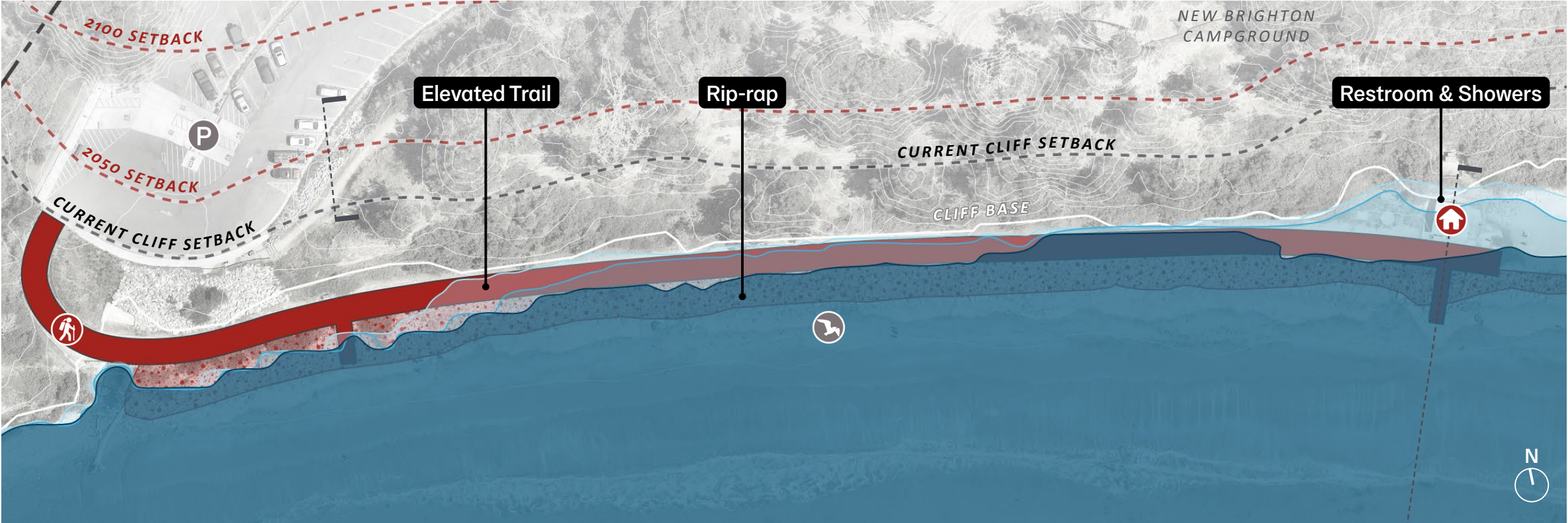
Park Assets

- Park Facility
- Public Access
- Natural Resource Area
- Parking



Projected Sea Level Rise Vulnerability with No Action

New Brighton State Beach



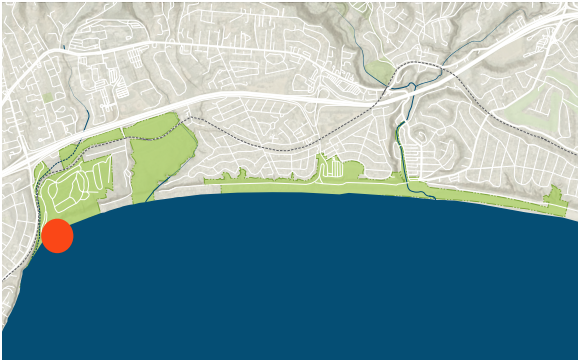
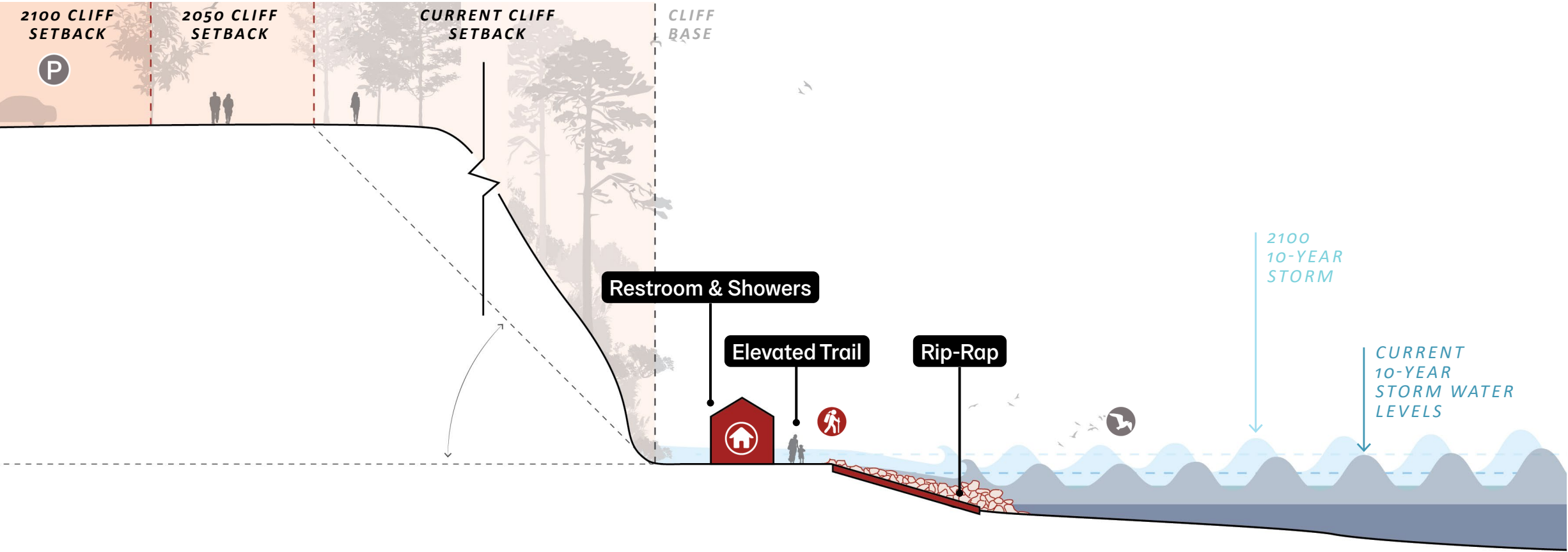
Legend

Future 10-Year Storm Water Levels

- 2100+: 6' SLR
- 2070: 2' SLR
- 2050: 1' SLR

Park Assets

- Park Facility
- Public Access
- Natural Resource Area
- Parking
- Vulnerable Asset



Adaptation Alternatives & Timeline

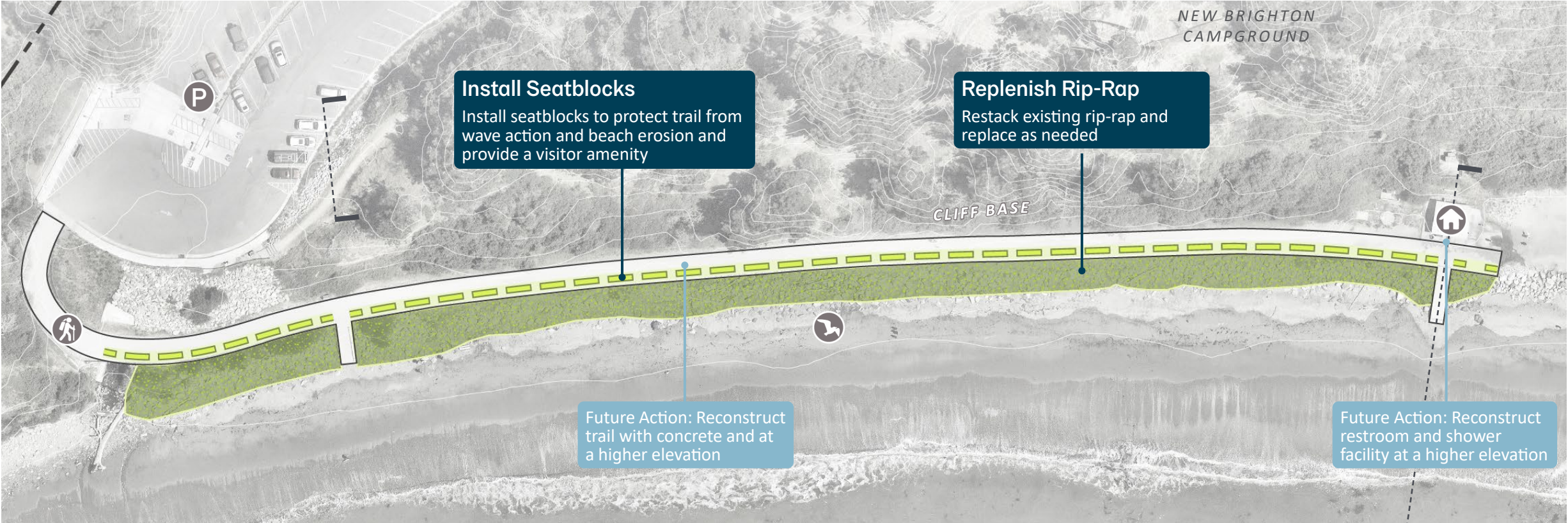
New Brighton State Beach



Planning Horizon		CURRENT	NEAR - TERM	MID - TERM	LONG - TERM
Time Frame		Now	By 2050	~2070	2100+
Coastal Hazard					
Vulnerabilities without Action					
Sea Level Rise (ft)		0'	1'	2'	4-6'
10-yr Storm Probability	Annual Chance	10%	12%	16%	33-100%
	Return Interval (yr)	10	8	6	1-3
Waves		Beach inaccessible in storms, cleanup and repairs required			
Beach Erosion		Trail requires cleanup and repair	Trail requires significant repair	Rip-rap and stormwater outlet require significant repair ; restroom and sewer lines require reconstruction	Restroom, rip-rap, stormwater outfall lost
Shoreline Retreat			Access ramps require significant repair	Trail, access ramps require reconstruction	
Cliff Retreat		Bluff collapses due to southern swells	Pumpout requires significant repair		
Adaptation Strategies					
Adaptation Actions					
Fortify & Protect	- Restack existing rip-rap after storms - Plan for maintenance capacity - Advance funding & design of adaptations		- Install seat blocks along the edge of the trail - Restack existing rip-rap and replace as-needed	- Raise trail grade, construct with concrete - Rebuild elevated restroom and shower facility - Replenish rip-rap	Install seawall to raise edge of trail
Restore & Relocate	- Plan for less frequent beach access - Identify asset relocation area(s); advance funding and design of new facilities		- Remove trail and rip-rap, install staircase for visitor access to beach from upper lot, gain sandy beach habitat - Reconstruct restroom and shower facility in upper parking lot, remove existing - Update building setbacks on clifftop for new construction		
Hybrid	- Plan for maintenance capacity and less frequent beach access - Identify asset relocation area(s); advance funding and design of new facilities		- Remove road and replace with consolidated, fortified access ramp; gain sandy beach habitat - Install native planting to promote erosion control on cliff face - Reconstruct restroom and shower facility in upper parking lot, remove existing - Update building setbacks on clifftop for new construction		

Adaptation Alternative: Fortify & Protect

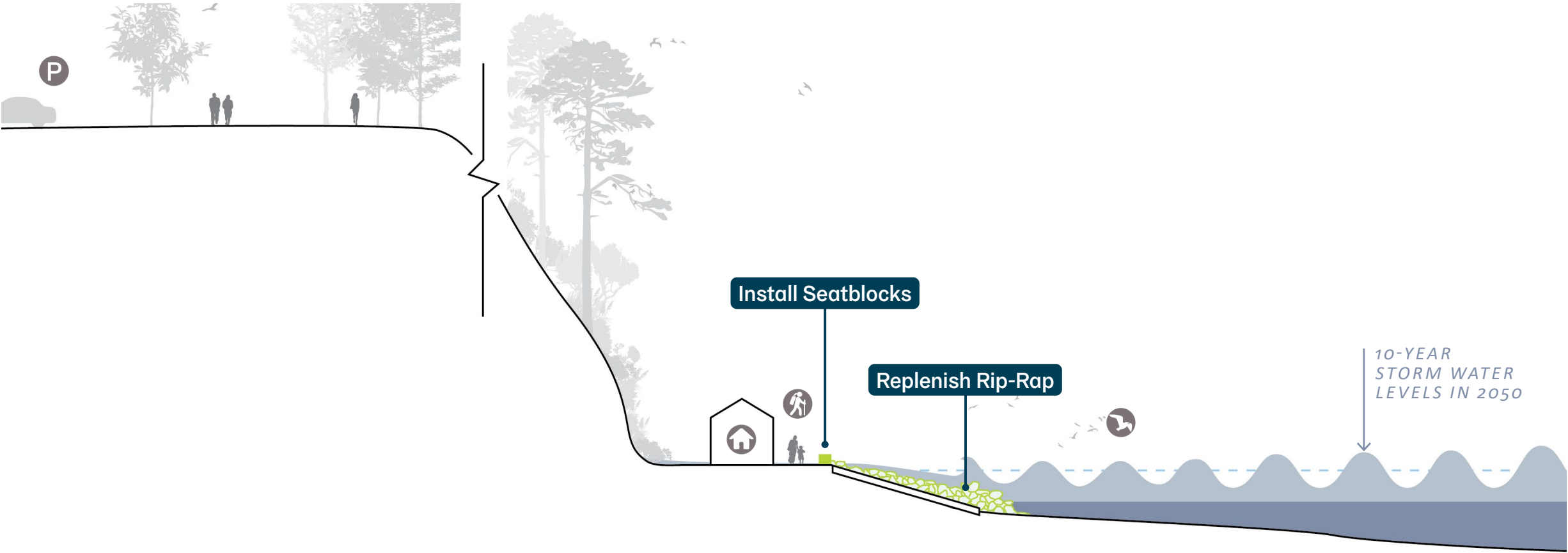
Near-Term Adaptations for New Brighton State Beach



The Fortify & Protect alternative utilizes grey infrastructure to secure existing assets, such as the trail from the upper lot to the beach and the restroom facility. Presently, proactive planning can continue to help to build maintenance capacity and prioritize funding for adaptation to coastal hazards projected to occur in the near-term (by 2050).

In the near-term, rip-rap will have to be restacked and supplemented after storms to protect assets from wave action. Install seatblocks along the trail edge to protect it and the cliff base from wave action and erosion.

Future Actions: Reconstruct road with concrete at a higher elevation. Replace restroom & shower facility with an elevated structure. Replace seatblocks with contiguous concrete seatwall.



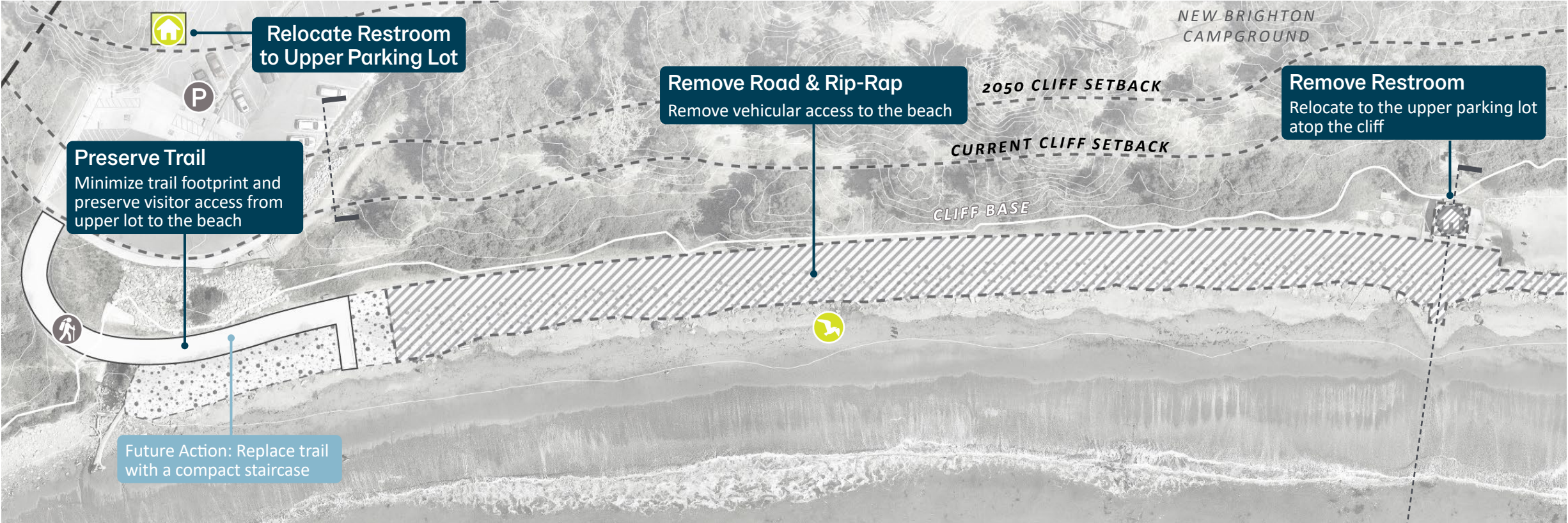
Seatblocks; Coyote Point, San Mateo, CA



Seatwall & Rock Revetment; Puerto Vallarta, Mexico

Adaptation Alternative: Restore & Relocate

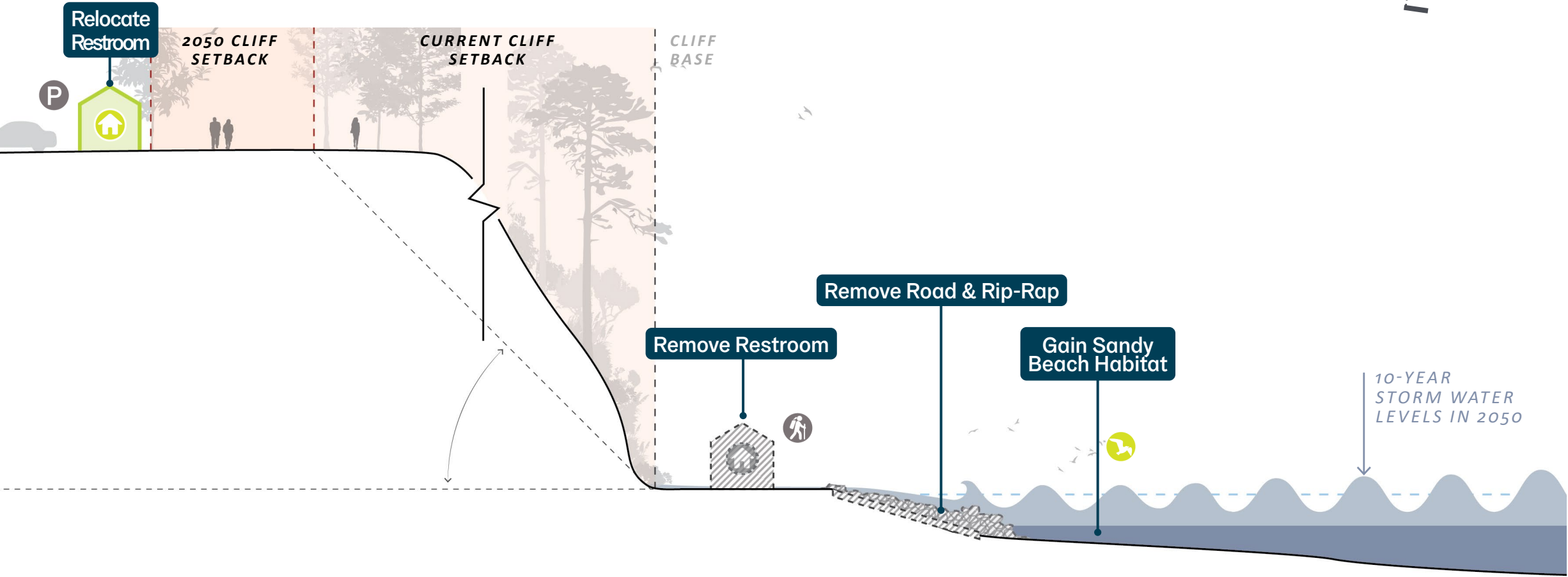
Near-Term Adaptations for New Brighton State Beach



The Restore & Relocate alternative prioritizes natural resource restoration. Assets and infrastructure are relocated to make room for coastal processes. Presently, proactive adaptation planning can identify asset relocation areas and advance funding and design of new facilities.

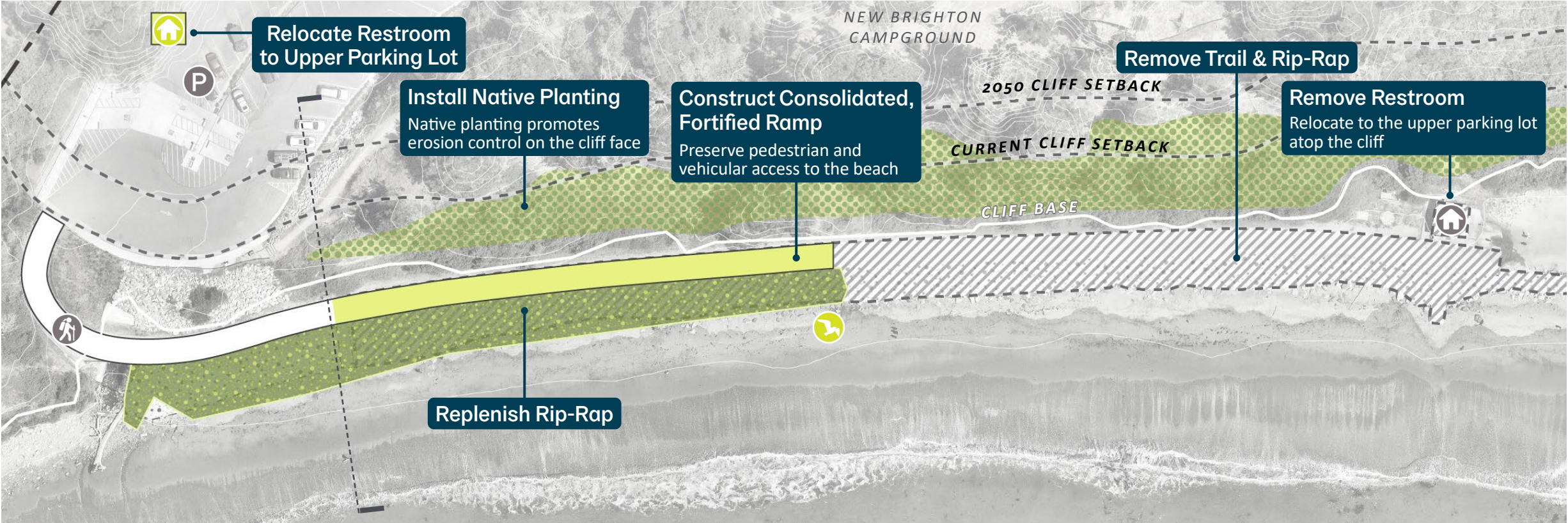
In the near-term, reduce the trail and rip-rap, removing maintenance vehicle access. Pedestrian access can be preserved. Remove the current restroom and shower facility and relocate a new restroom in the upper parking lot.

Future Action: Remove trail and replace with a more compact staircase.



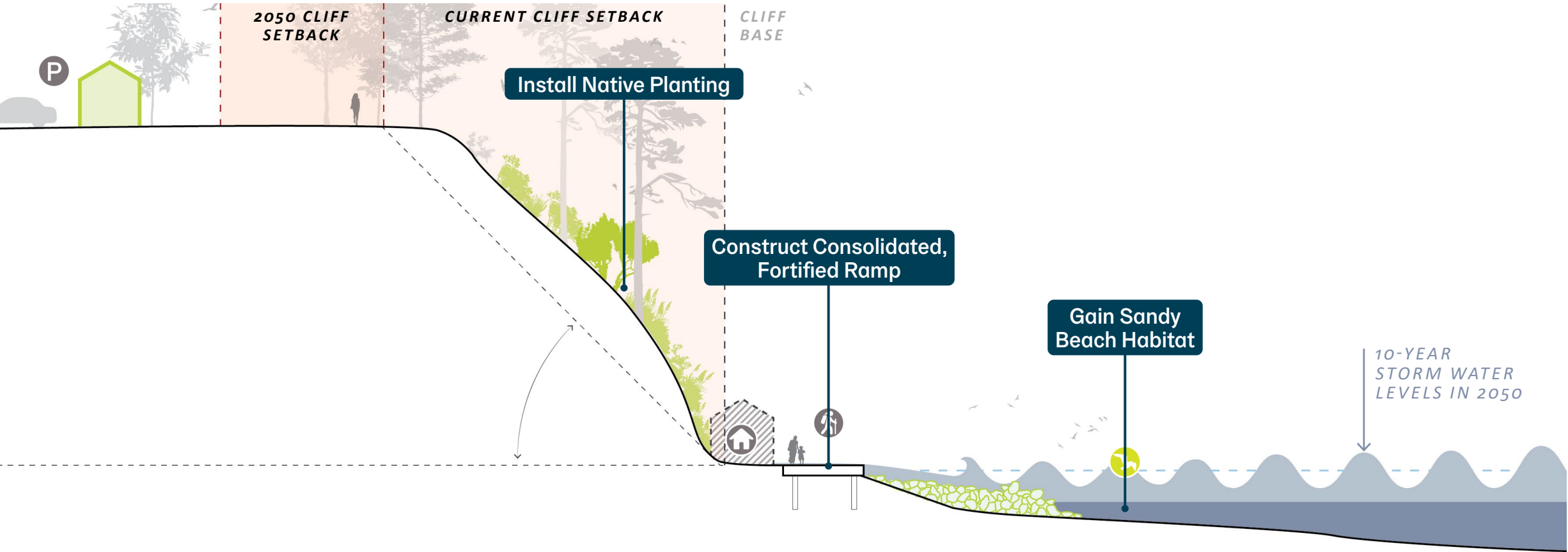
Adaptation Alternative: Hybrid

Near-Term Adaptations for New Brighton State Beach



The Hybrid alternative combines strategies to maintain consolidated infrastructure while making room for coastal processes. They utilize both green and grey infrastructure. Presently, proactive adaptation planning can identify asset relocation areas and advance funding and design of facilities being relocated or fortified in place.

In the near-term, reduce the trail and construct a consolidated, fortified ramp to preserve pedestrian and maintenance vehicle access from the upper lot to the beach. Remove the current restroom and shower facility and relocate a new restroom in the upper parking lot. Install native planting on the cliff face to provide erosion control.



Native Planting

Seacliff State Beach RV Campground



New Brighton
State Beach

Seacliff State Beach
RV Campground

Seacliff State Beach
Day-Use Area

Rio Del Mar
State Beach

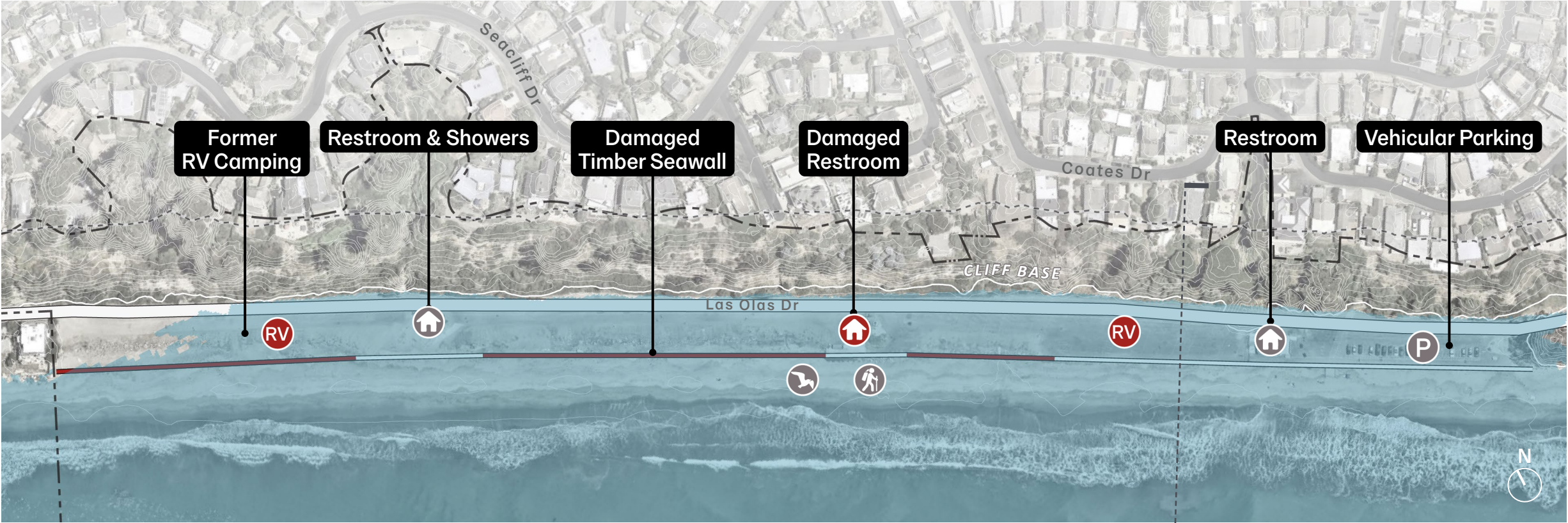
Platforms at Rio Del
Mar State Beach

PACIFIC OCEAN



Existing Conditions

Seacliff State Beach RV Campground

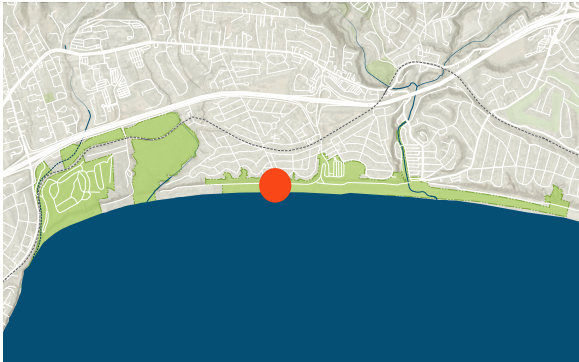
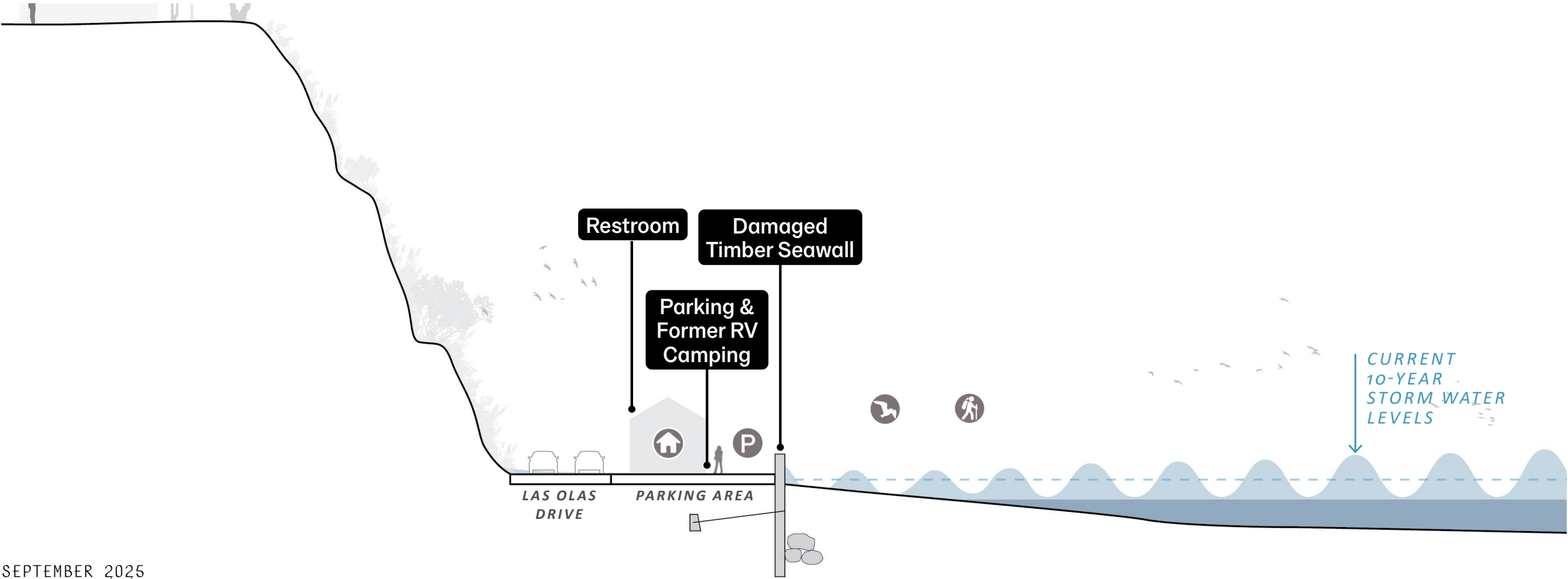


Legend

- Park Boundary
- Current 10-Year Storm Water Level
- 2023 Timber Seawall Failure

Park Assets

- Park Facility
- Public Access
- Natural Resource Area
- Parking
- RV Parking
- Vulnerable Asset



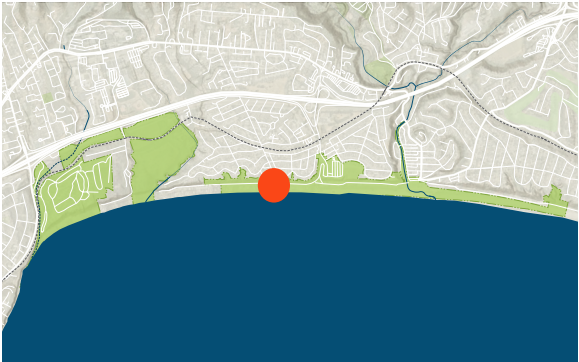
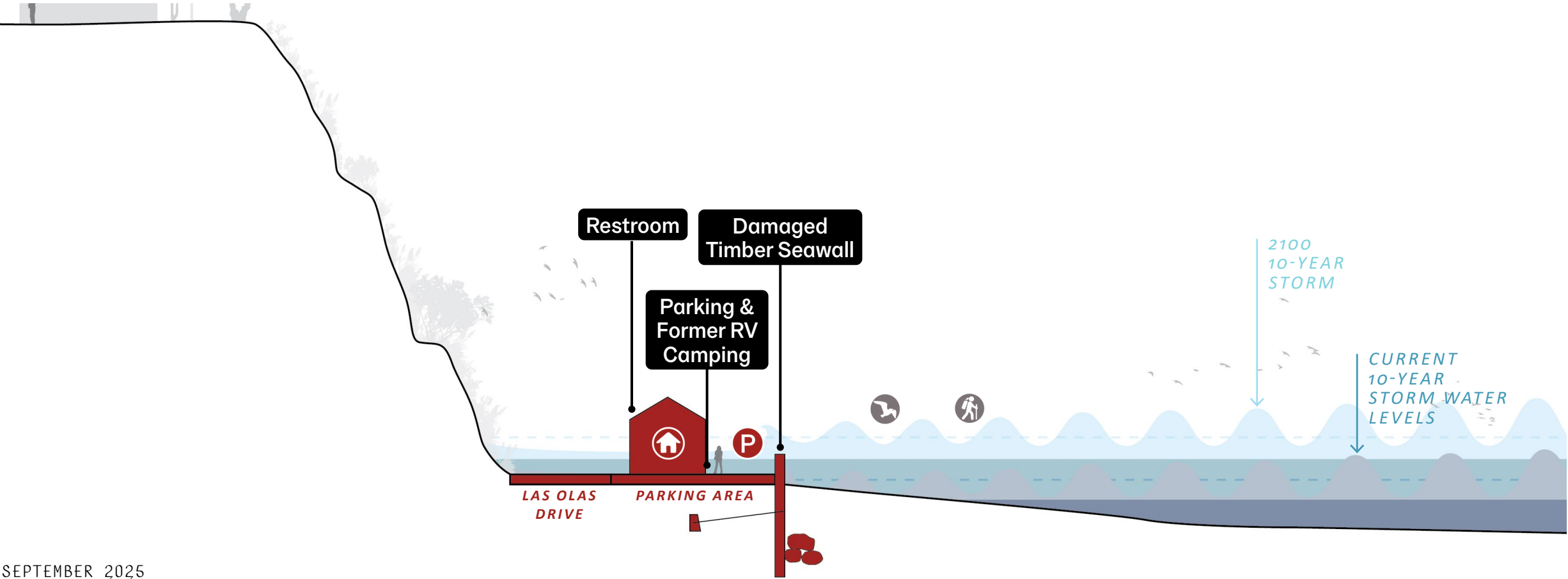
Projected Sea Level Rise Vulnerability with No Action

Seacliff State Beach RV Campground



Legend

- Park Boundary
- Future 10-Year Storm Water Levels**
 - 2100+: 6' SLR
 - 2070: 2' SLR
 - 2050: 1' SLR
- Park Assets**
 - Park Facility
 - Public Access
 - Natural Resource Area
 - Parking
 - RV Parking
 - Vulnerable Asset



Adaptation Alternatives & Timeline

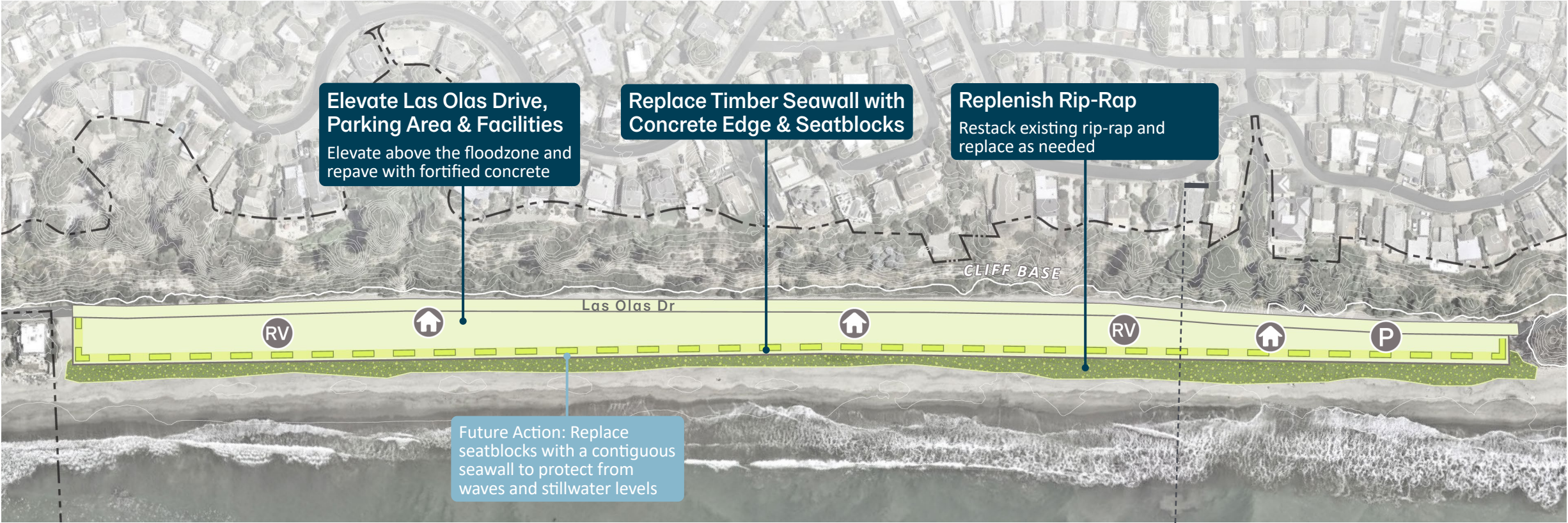
Seacliff State Beach RV Campground



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Time Frame		Now	by 2050	~2070	2100+
Coastal Hazard					
Vulnerabilities without Action					
Sea Level Rise (ft)		0'	1'	2'	4-6'
10-yr Storm Probability	Annual Chance	10%	12%	16%	25-50%
	Return Interval (yr)	10	8	6	2-4
Waves		Beach inaccessible in storms, restrooms require significant repair , some RV parking requires reconstruction	Restrooms, pump station, beach access stairs require significant repair ; rip-rap must be replaced; Las Olas Drive and all parking areas require reconstruction	All park assets require reconstruction ; riprap lost	
Beach Erosion		Cleanup required of entire area; restrooms & rip-rap require repair , riprap requires re-stacking and some replacement	Stormwater outlets require significant repair	Beach access stairs & stormwater outfalls lost	Groundwater monitoring wells lost
Shoreline Retreat			Access ramps will require significant repair		
Cliff Retreat			Stormwater conduits will require significant repair	Las Olas Drive & Beachgate Trail require significant repairs , stormwater conduits require reconstruction	Beachgate Trail requires reconstruction
Adaptation Strategies					
Adaptation Actions					
Fortify & Protect		• Replenish rip-rap • Plan for maintenance capacity • Advance funding and design of repairs and adaptations	• Elevate Las Olas Drive and parking area, include concrete retaining wall and rip-rap, new access ramps and seatblocks • Rebuild and elevate restroom facilities	• Replace seatblocks with contiguous concrete seatwall around edge of parking area • Replenish rip-rap	• Raise seawall • Replenish rip-rap
Restore & Relocate		• Remove existing damaged facilities • Plan for change in use and access patterns • Identify asset relocation area(s); advance funding and design of new facilities	• Remove parking, gain sandy beach habitat • Relocate restroom facilities to Seacliff Day Use Area or upper lot		
Hybrid		• Remove existing damaged facilities • Plan for maintenance capacity and reduced access • Identify asset relocation area(s); advance funding and design of new facilities	• Remove RV campground area, consolidate vehicular access to parking lot • Rebuild one consolidated, elevated restroom facilities • Install vegetated dunes with stabilized core or leading edge and boardwalk trail in reclaimed space	• Replace seatblocks with contiguous concrete seatwall around edge of parking area • Replenish dunes	• Raise seawall and adjacent path • Replenish dunes

Adaptation Alternative: Fortify & Protect

Near-Term Adaptations for Seacliff State Beach RV Campground



The Fortify & Protect alternative utilizes grey infrastructure to secure existing assets, such as the parking area and restroom facilities. Presently, a preferred near-term adaptation alternative should be selected for this site as it sustained significant damage in recent storms.

In the near-term, remove the timber seawall and reconstruct Las Olas Drive and the parking areas at a higher elevation. Include a concrete toe wall and seatblocks along the edge of the new elevated parking area. Construct new elevated restroom facilities.

Future Action: Replace seat blocks with a contiguous seawall to protect from higher water levels.



Seat blocks; Coyote Point, San Mateo, CA



Seawall & Rock Revetment; Puerto Vallarta

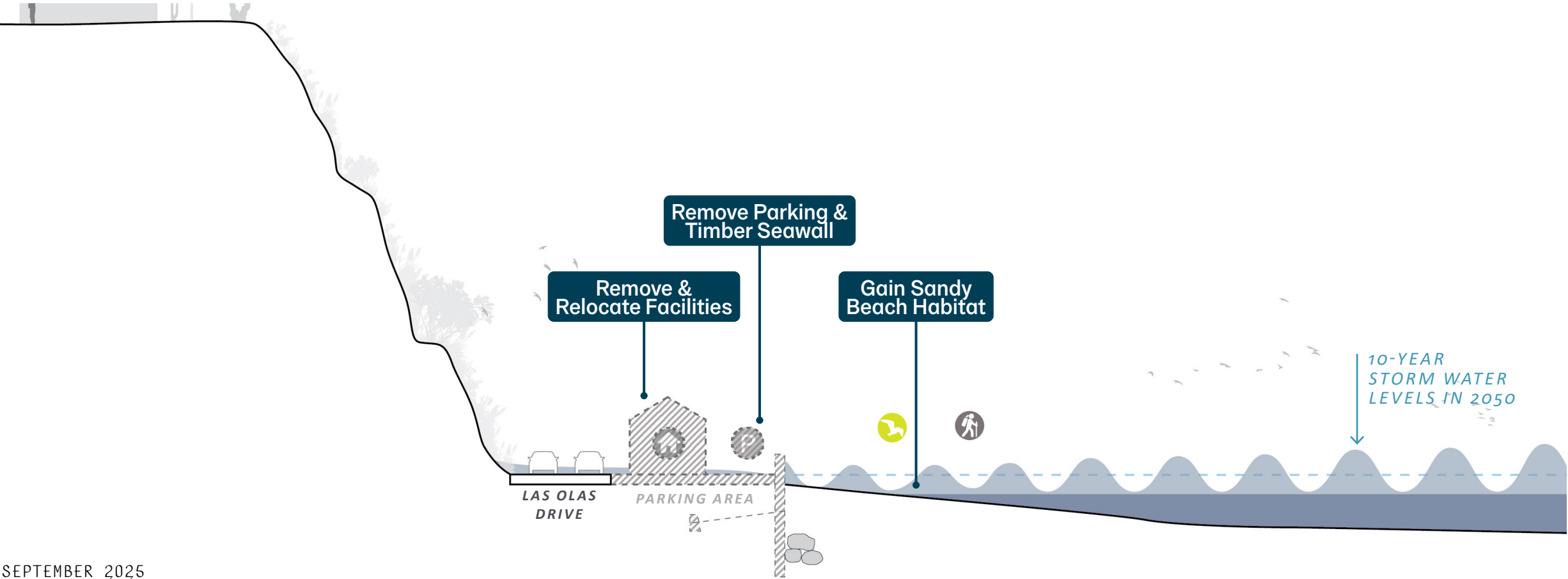
Adaptation Alternative: Restore & Relocate

Near-Term Adaptations for Seacliff State Beach RV Campground



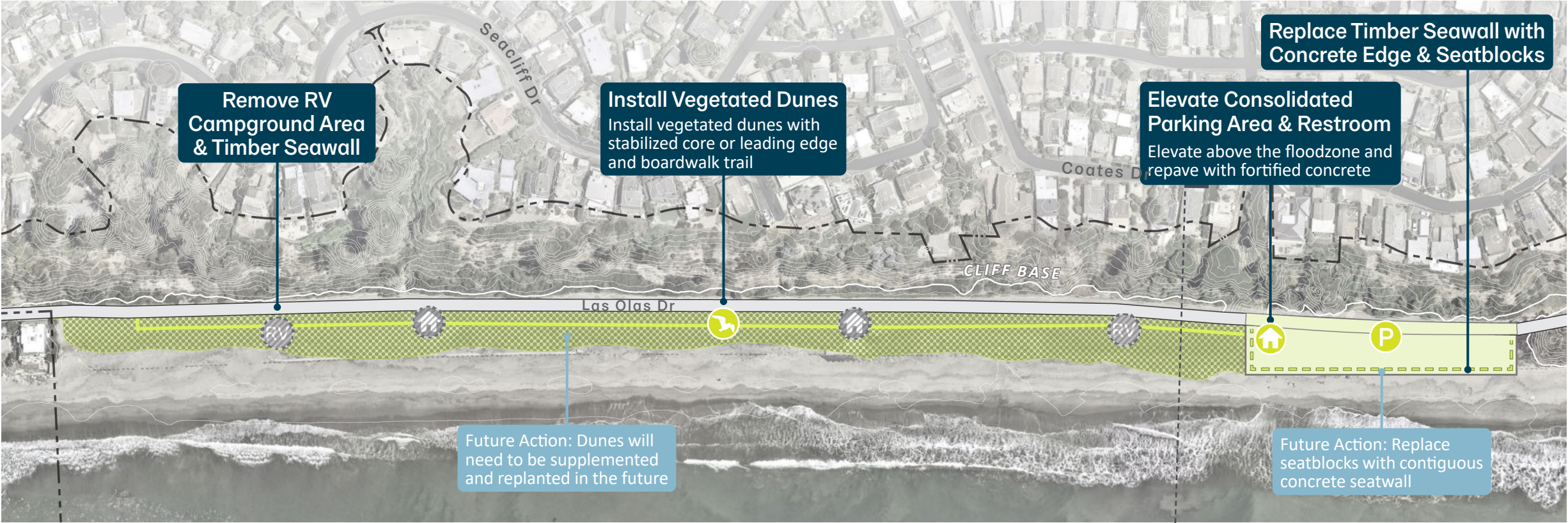
The Restore & Relocate alternative prioritizes natural resource restoration. It relocates or consolidates assets to less vulnerable areas to make room for coastal processes. Presently, a preferred near-term adaptation alternative should be selected for this site as it sustained significant damage in recent storms.

In the near-term, remove damaged facilities and relocate them to other areas of the park like the Seacliff Day-Use Area or the upper lot. Remove parking and the timber seawall, and gain sandy beach habitat.



Adaptation Alternative: Hybrid

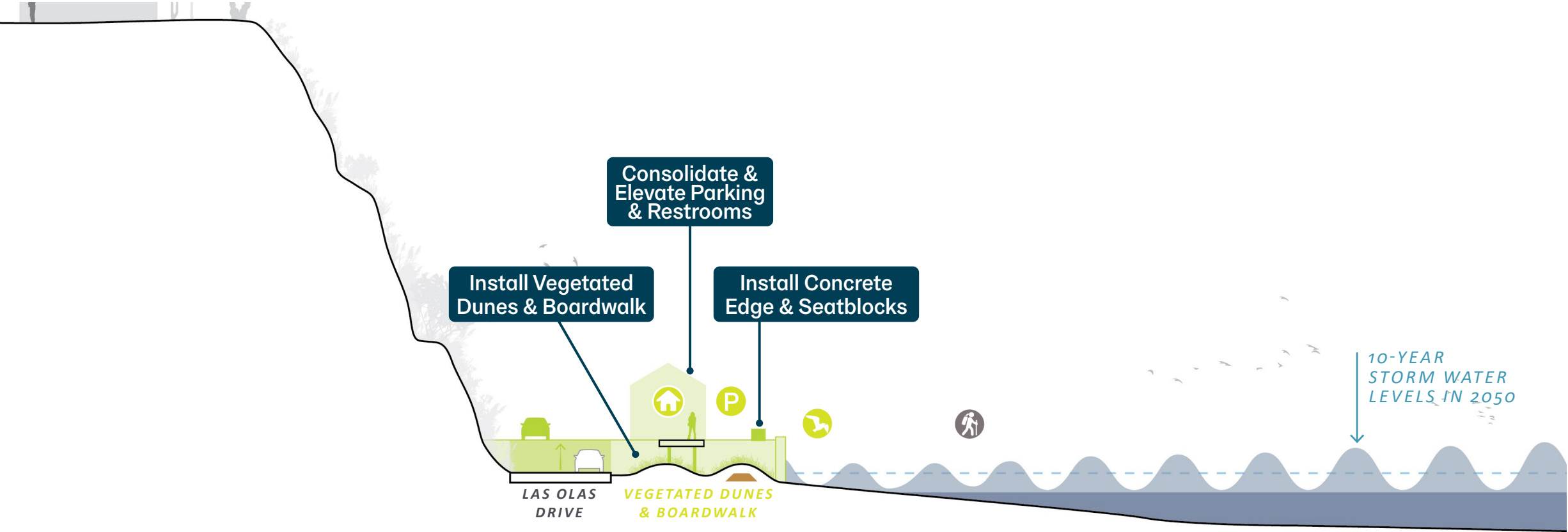
Near-Term Adaptations for Seacliff State Beach RV Campground



The Hybrid alternative combines strategies to maintain assets while making room for coastal processes. They utilize both green and grey infrastructure. Presently, a preferred near-term adaptation alternative should be selected for this site as it sustained significant damage in recent storms.

In the near-term, remove damaged parking areas, restrooms and timber seawall. Consolidate into one smaller, elevated parking area at the east end of the site with a concrete toe wall and seatblocks along the edge. Install vegetated dunes and a boardwalk trail in reclaimed space.

Future Action: Replace seatblocks with a contiguous concrete seatwall to protect from waves and higher stillwater levels. In the long-term, raise the seawall and adjacent path. Supplement dunes as needed.

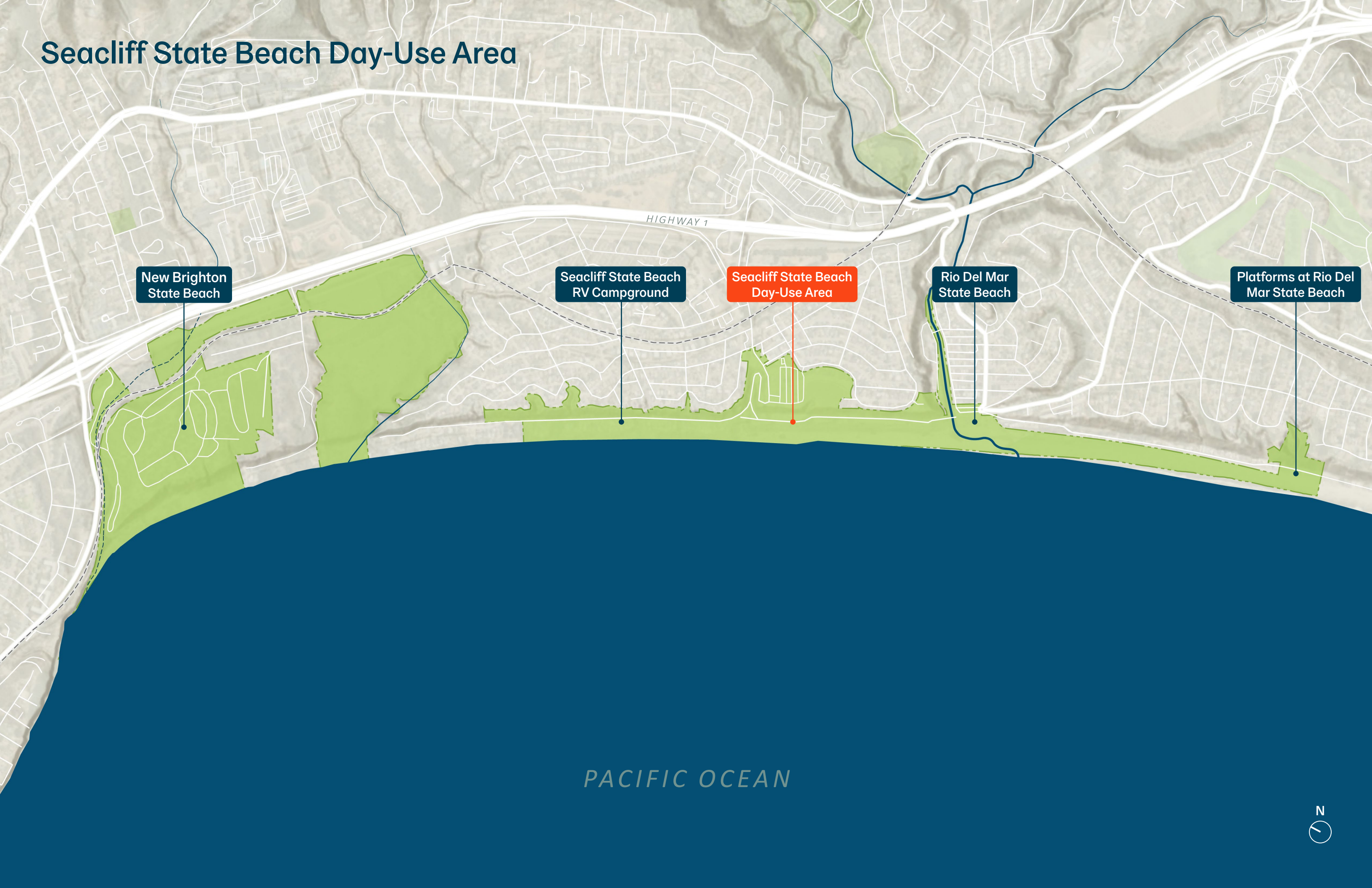


Vegetated Dunes



Seat blocks; Coyote Point, San Mateo, CA

Seacliff State Beach Day-Use Area



New Brighton
State Beach

Seacliff State Beach
RV Campground

Seacliff State Beach
Day-Use Area

Rio Del Mar
State Beach

Platforms at Rio Del
Mar State Beach

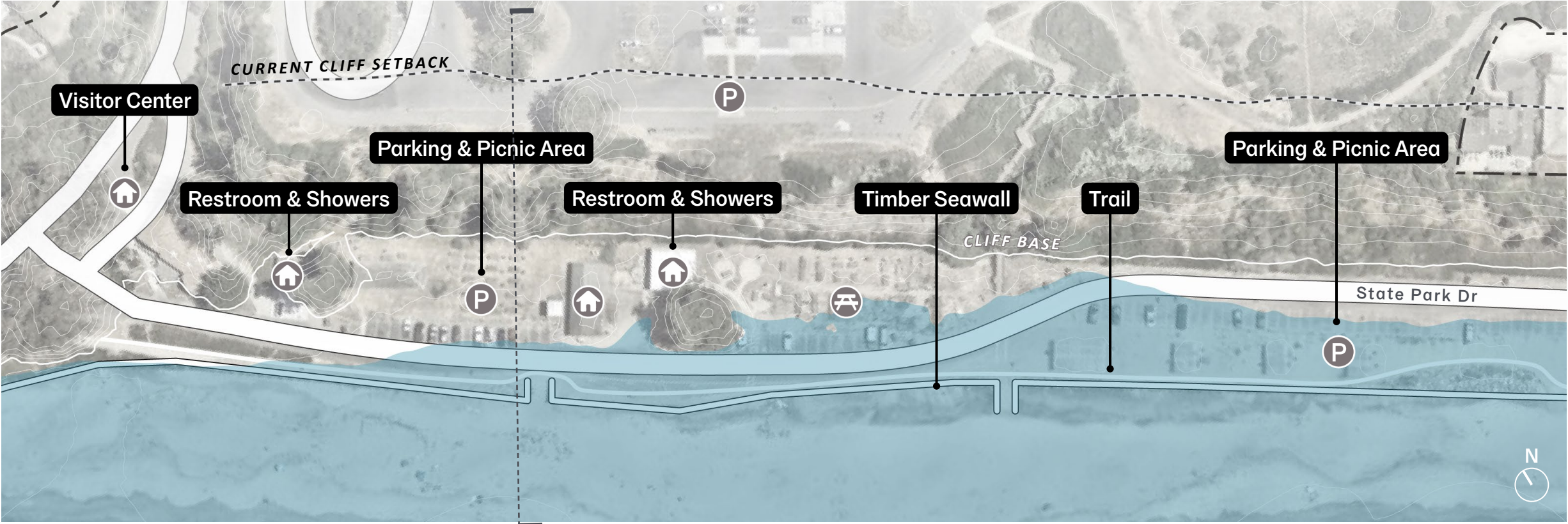
HIGHWAY 1

PACIFIC OCEAN



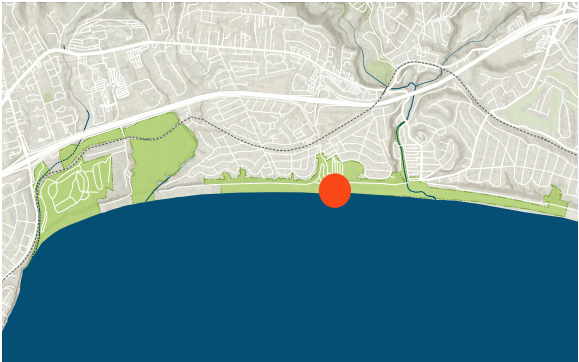
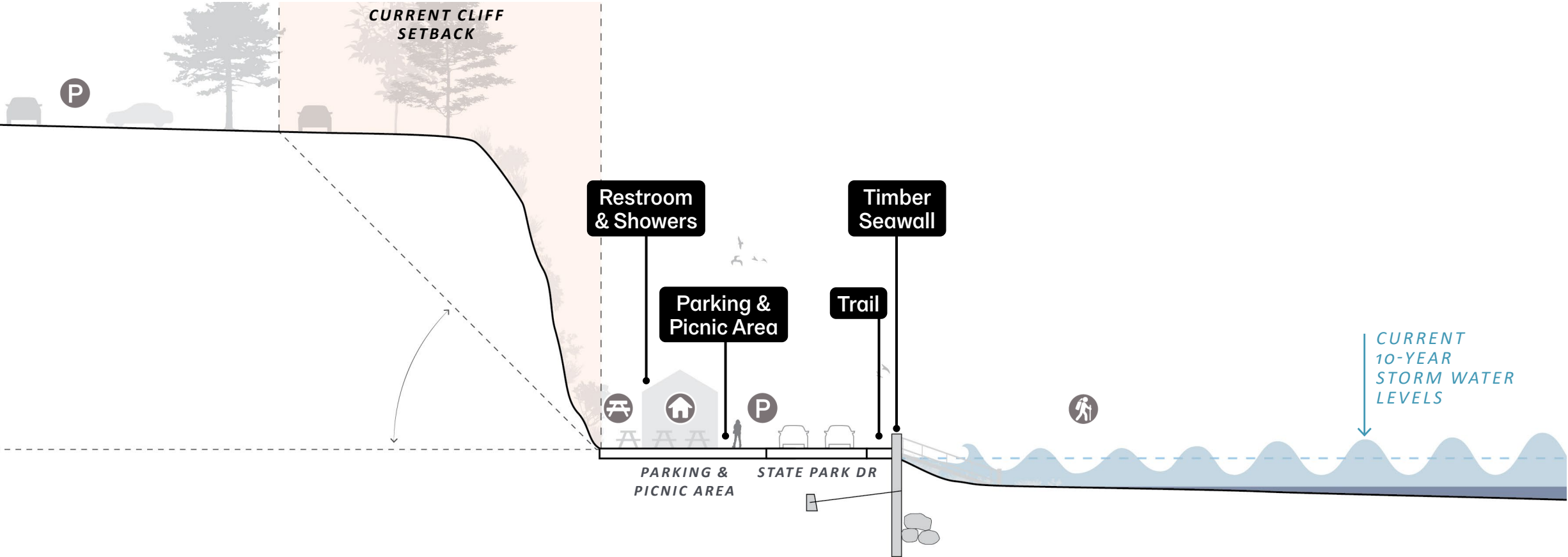
Existing Conditions

Seacliff State Beach Day-Use Area



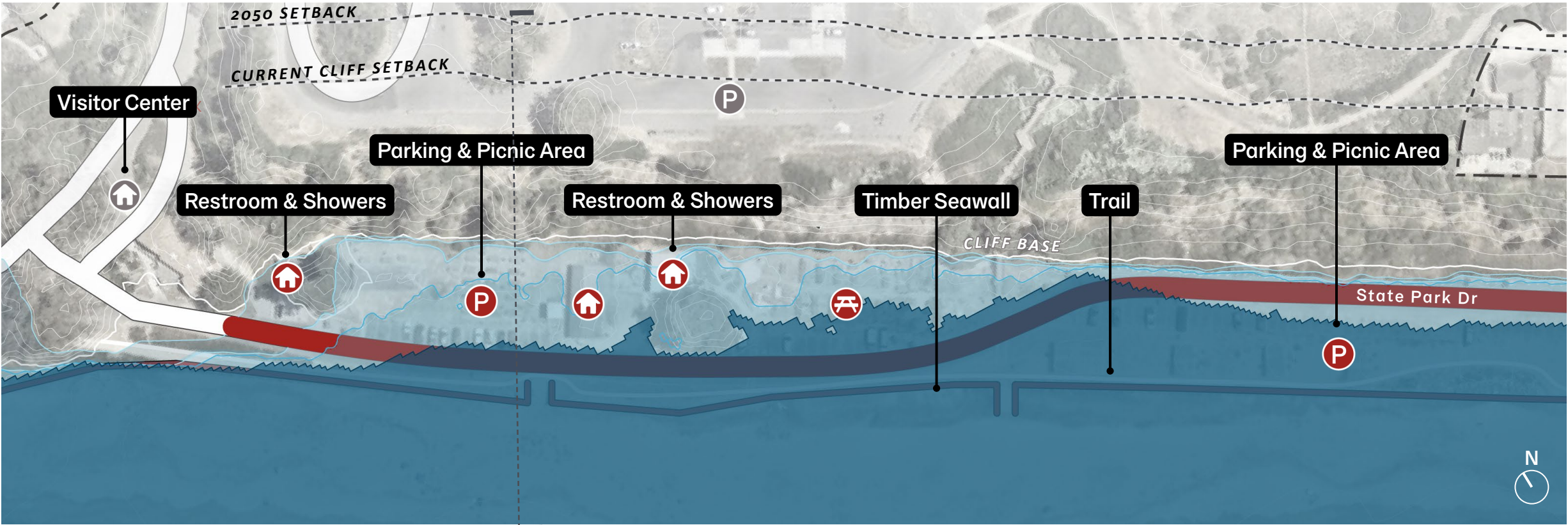
Legend

- Park Boundary
- Current 10-Year Storm Water Level
- Park Assets**
 - Park Facility
 - Public Access
 - Natural Resource Area
 - Parking
 - Recreation



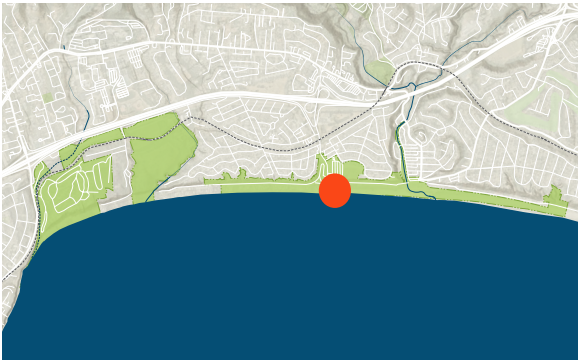
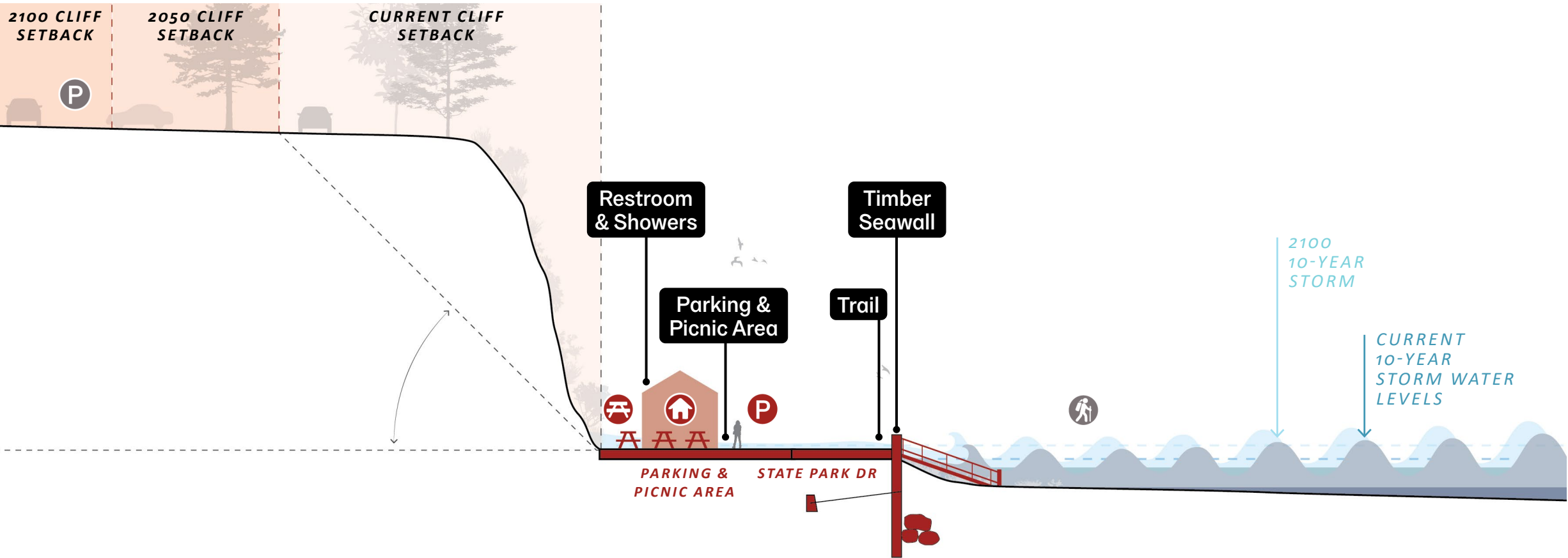
Projected Sea Level Rise Vulnerability with No Action

Seacliff State Beach Day-Use Area



Legend

- Park Boundary
- Future 10-Year Storm Water Levels**
 - 2100+: 6' SLR
 - 2070: 2' SLR
 - 2050: 1' SLR
- Park Assets**
 - Park Facility
 - Public Access
 - Natural Resource Area
 - Parking
 - Recreation
 - Vulnerable Asset



Adaptation Alternatives & Timeline

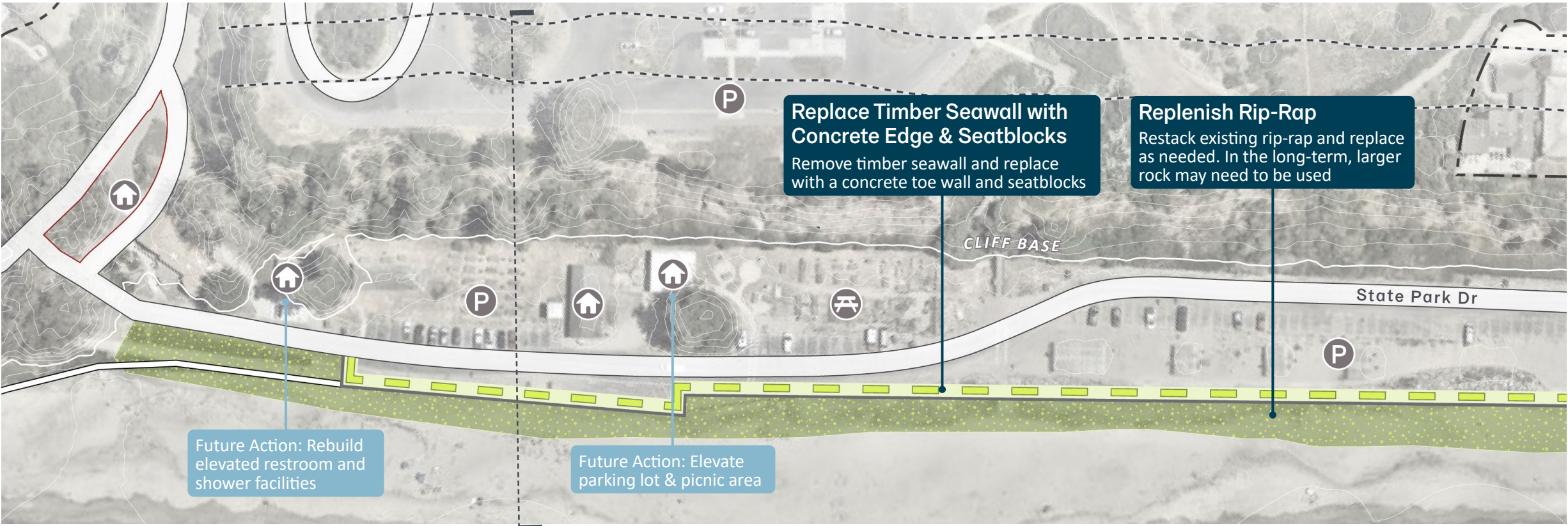
Seacliff State Beach Day-Use Area



Planning Horizon		CURRENT	NEAR - TERM	MID - TERM	LONG - TERM
Time Frame		Now	by 2050	~2070	2100+
Coastal Hazard					
Vulnerabilities without Action					
Sea Level Rise (ft)		0'	1'	2'	4-6'
10-yr Storm Probability	Annual Chance	10%	12%	16%	25-50%
	Return Interval (yr)	10	8	6	2-4
Waves		Beach inaccessible in storms, cleanup required; beach access stairs & riprap need repairs	Beach access stairs require reconstruction ; beach furnishings and picnic amenities require repairs	Furnishings and picnic amenities require replacement	Western restroom requires significant repair ; concession and middle restroom require reconstruction ; restroom by beach, parking lot, access stairs to upper lot lost
Beach Erosion				Rip-rap requires significant repair	Covered picnic areas lost
Cliff Retreat		Staff housing atop bluff is vulnerable		State Park Drive & Beachgate Trail require significant repairs ; stormwater conduits require reconstruction	Saff housing atop bluff is lost
Adaptation Strategies					
Adaptation Actions					
Fortify & Protect		- Plan for maintenance capacity - Advance funding & design of adaptations - Replenish rip-rap	- Install a concrete toe wall & seat blocks along edge of parking area - Replenish rip-rap	- Elevate parking & picnic area, include concrete retaining wall - Rebuild elevated restroom and shower facilities - Replenish rip-rap	- Install seatwall to raise edge of facilities - Replenish rip-rap
Restore & Relocate		- Plan for reduced beach access - Identify asset relocation area(s); advance funding and design of new facilities	Set back road along cliff base, consolidate parking & picnic area and include concrete toe wall along new pavement edge; gain sandy beach habitat	Relocate restrooms & picnic spaces to upper parking lot	- Remove road, remaining parking and assets - Continue to gain sandy beach habitat
Hybrid		- Plan for maintenance capacity and reduced access - Identify asset relocation area(s); advance funding and design of new facilities - Replenish rip-rap	- Set back road along cliff base, consolidate parking & picnic area and include concrete toe wall along new pavement edge - Install vegetated dunes with stabilized core or leading edge in reclaimed space; install boardwalk through dunes - Install native planting to promote erosion control on cliff face	- Elevate the consolidated parking lot & picnic area, include concrete retaining wall - Consolidate restrooms and rebuild one elevated facility at western-most location - Replenish dunes	- Install seatwall to raise edge of facilities - Replenish dunes

Adaptation Alternative: Fortify & Protect

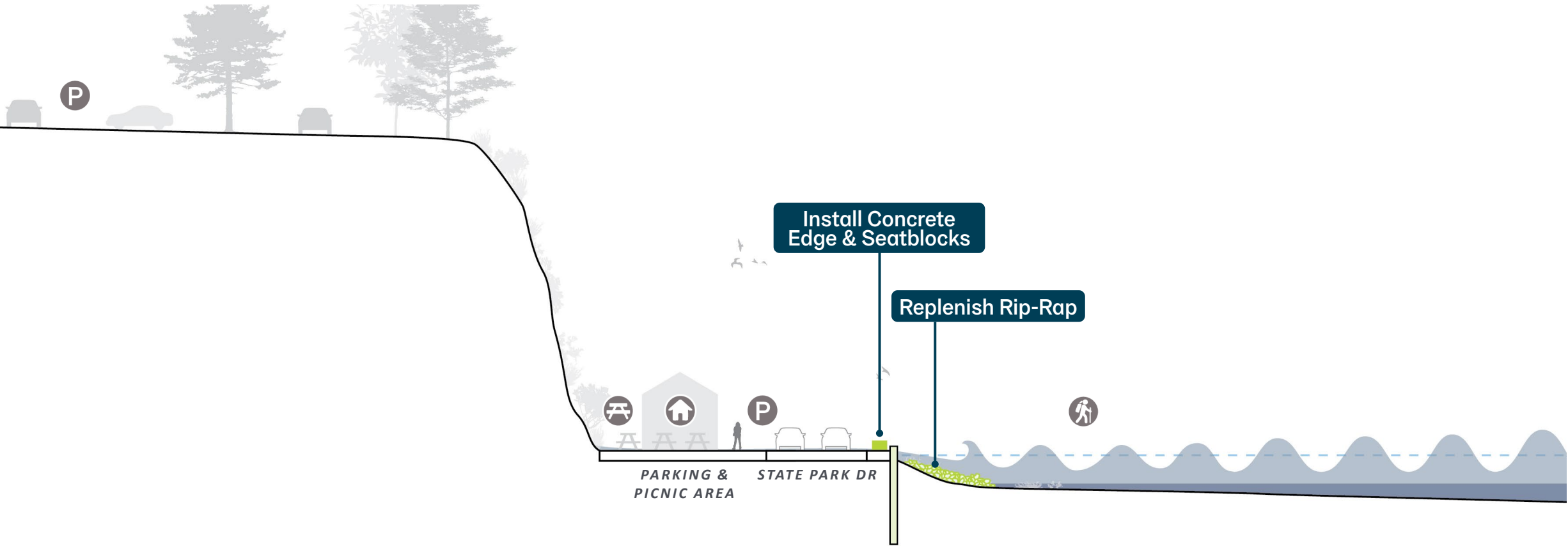
Near-Term Adaptations for Seacliff State Beach Day-Use Area



The Fortify & Protect alternative utilizes grey infrastructure to secure existing assets, such as the parking area and restroom facilities. Presently, proactive planning can continue to help to build maintenance capacity and prioritize funding for adaptation to coastal hazards projected to occur in the near-term (by 2050).

In the near-term, restack and supplement rip-rap after storms to protect assets from wave action. Remove the timber seawall and install a concrete toe wall and seatblocks around the edge of the paved area.

Future Action: Elevate the parking and picnic area and replace with restroom buildings with new, elevated facilities.



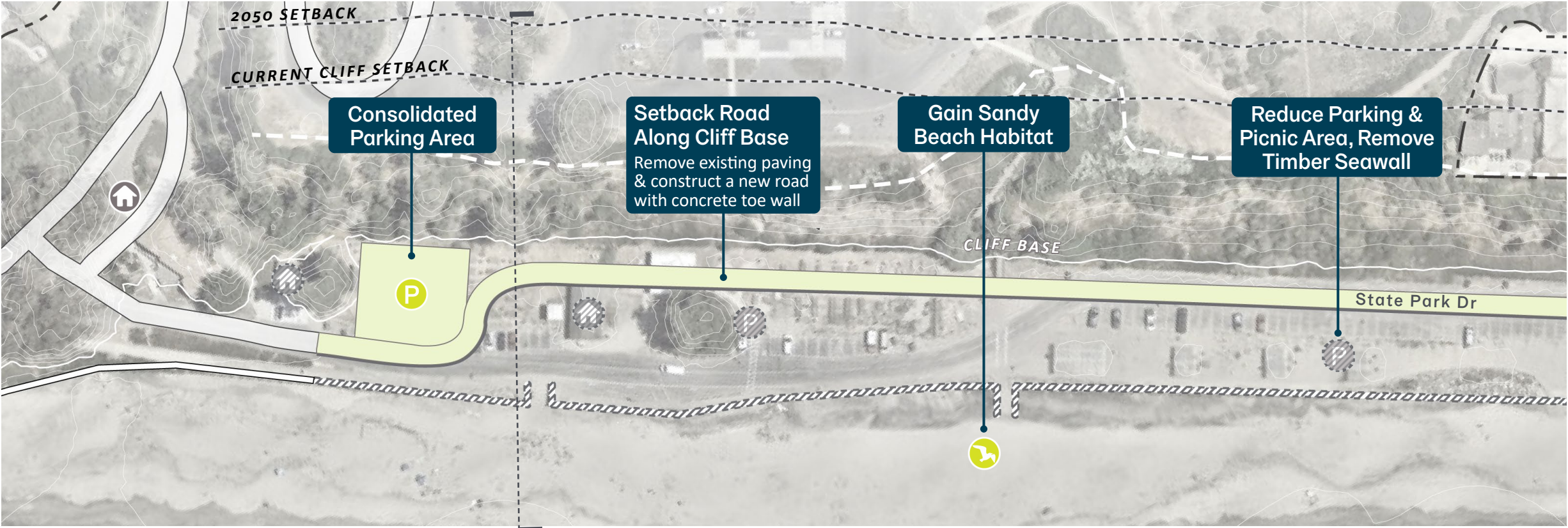
Seat blocks; Coyote Point, San Mateo, CA



Seawall & Rock Revetment; Puerto Vallarta, Mexico

Adaptation Alternative: Restore & Relocate

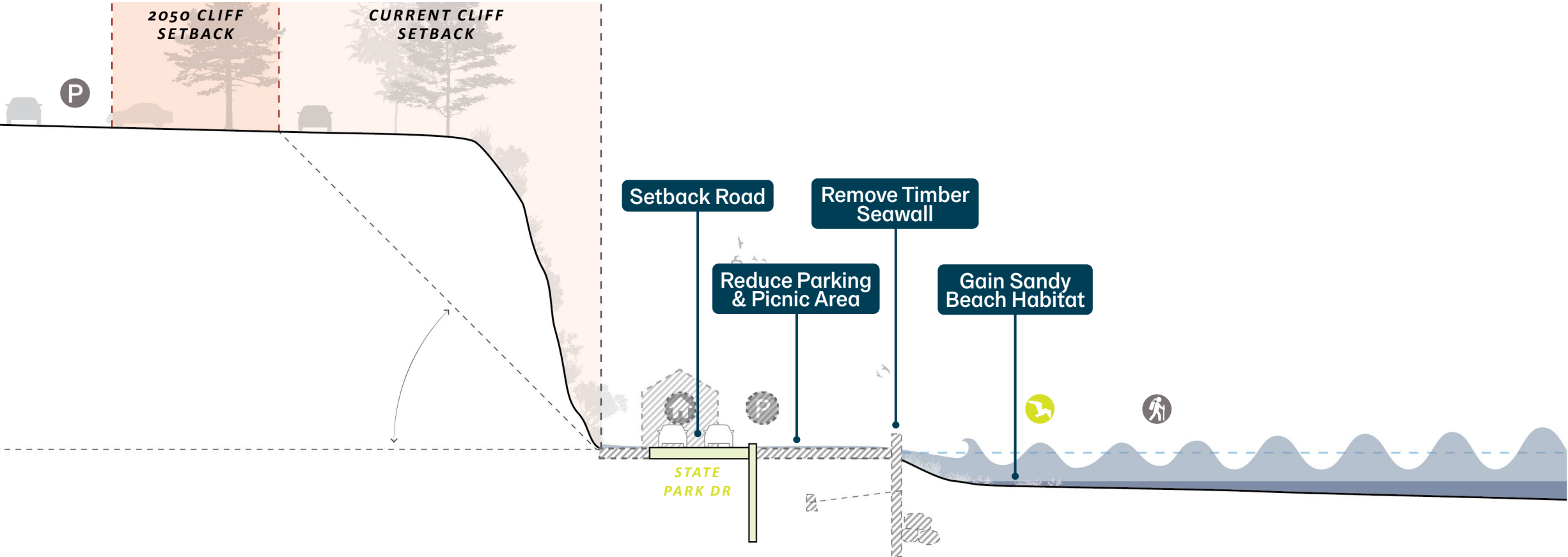
Near-Term Adaptations for Seacliff State Beach Day-Use Area



The Restore & Relocate alternative prioritizes natural resource restoration. Assets and infrastructure are relocated to make room for coastal processes. Presently, proactive adaptation planning can identify asset relocation areas and advance funding and design of new facilities.

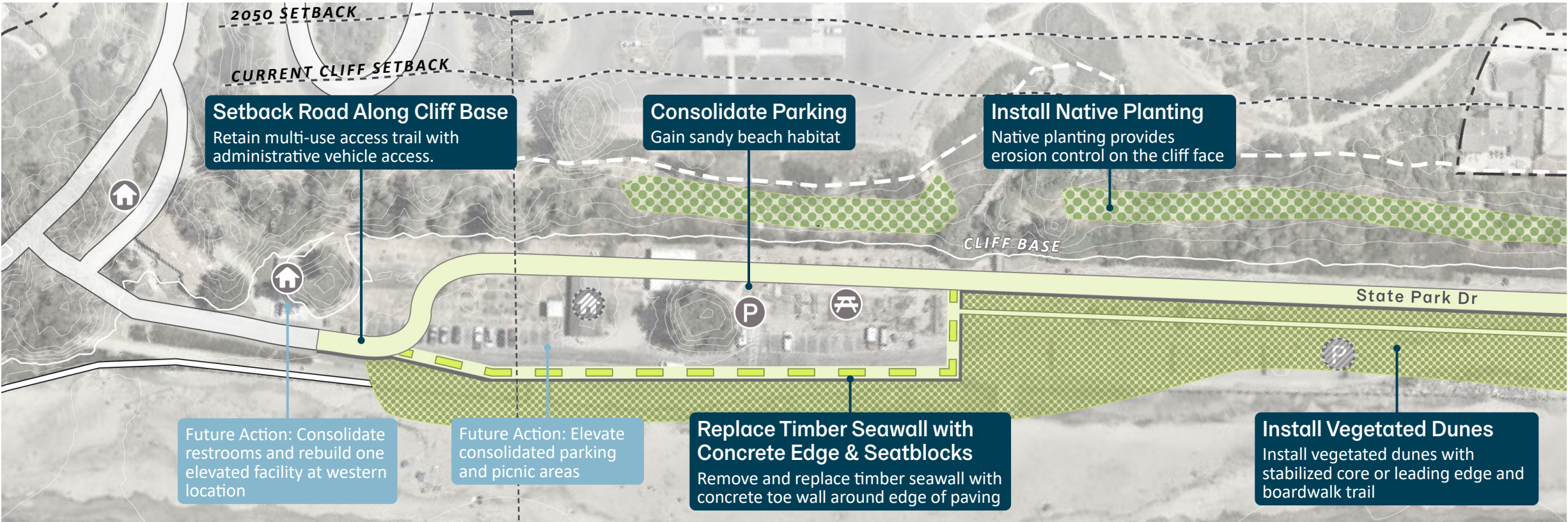
In the near-term, setback the road against the cliff base and reduce the parking and picnic area. Remove the timber seawall and construct a concrete toe wall along the new edge of pavement.

Future Action: Relocate restrooms and picnic spaces to the upper parking lot and remove all assets.



Adaptation Alternative: Hybrid

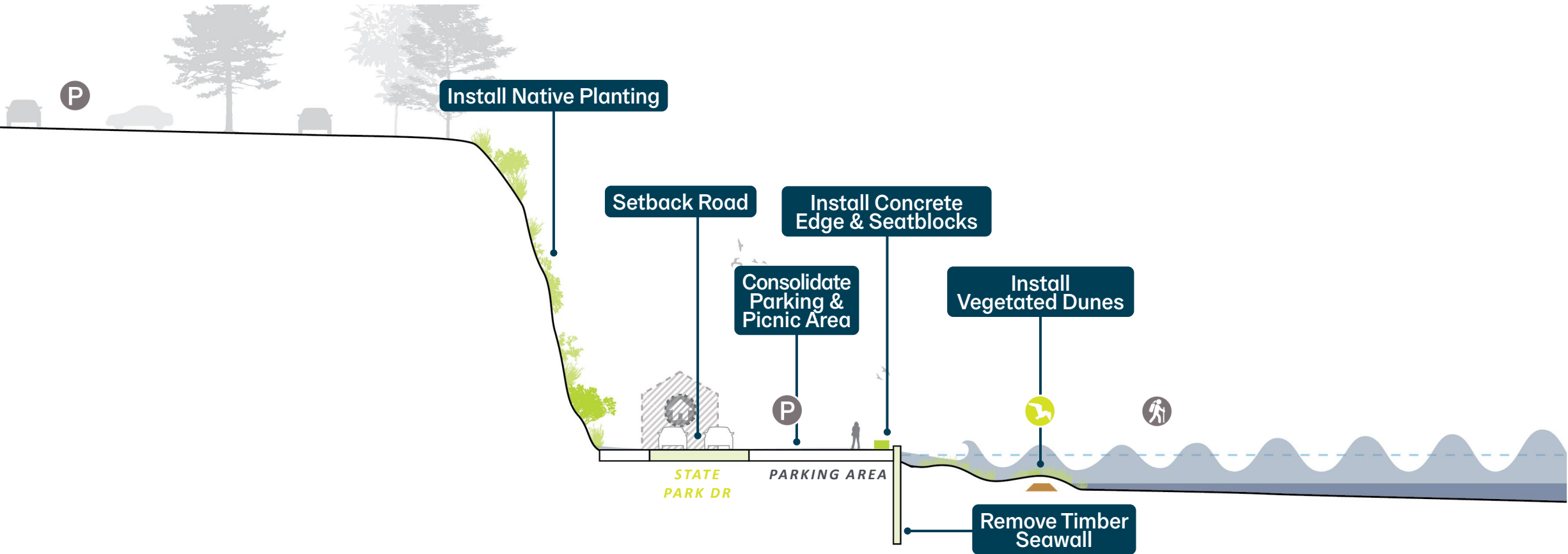
Seacliff State Beach Day-Use Area



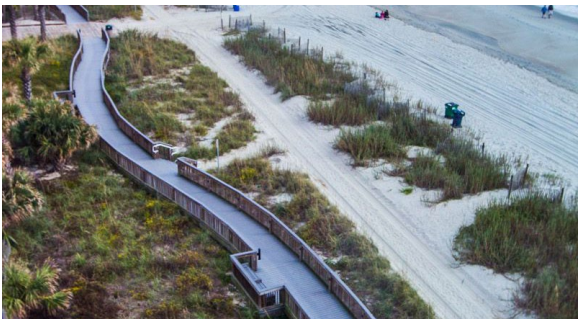
The Hybrid alternative combines strategies to maintain consolidated infrastructure while making room for coastal processes. They utilize both green and grey infrastructure. Presently, proactive adaptation planning can identify asset relocation areas and advance funding and design of facilities being relocated or fortified in place.

In the near-term, set back State Park Drive against the cliff base and reduce parking and picnic area. Construct a concrete toe wall and seatblocks can be constructed to replace the timber seawall along the beach front edge of the consolidated parking area. Restack and replenish rip-rap as needed. Install vegetated dunes and a boardwalk trail, and native planting on the cliff face to provide erosion protection.

Future Action: Elevate the consolidated parking and picnic area. Consolidate restrooms into one elevated facility at the western-most location. Replenish dune planting as needed.



Vegetated Dunes



Dune & Boardwalk Trail

Rio Del Mar State Beach



New Brighton
State Beach

Seacliff State Beach
RV Campground

Seacliff State Beach
Day-Use Area

Rio Del Mar
State Beach

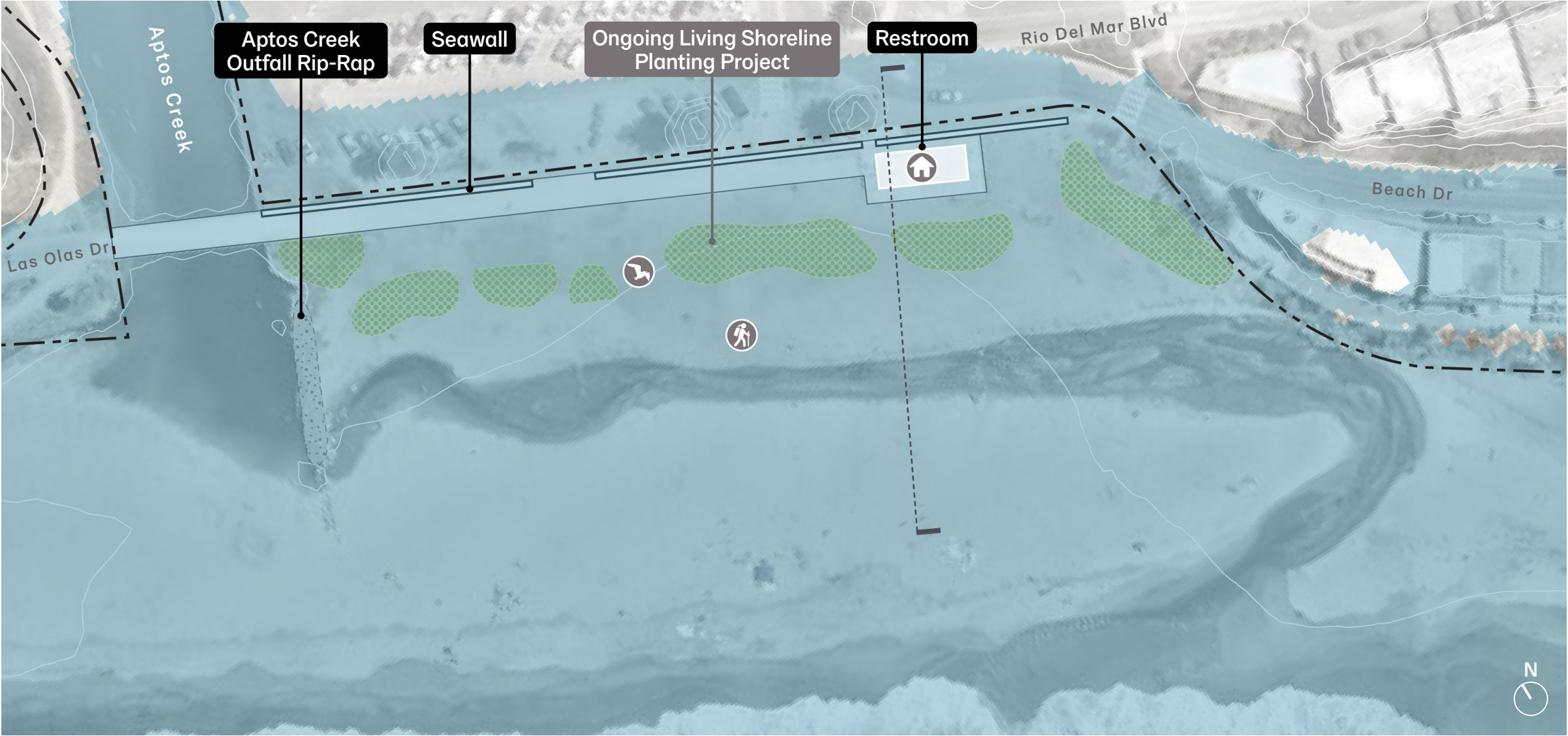
Platforms at Rio Del
Mar State Beach

PACIFIC OCEAN



Existing Conditions

Rio Del Mar State Beach

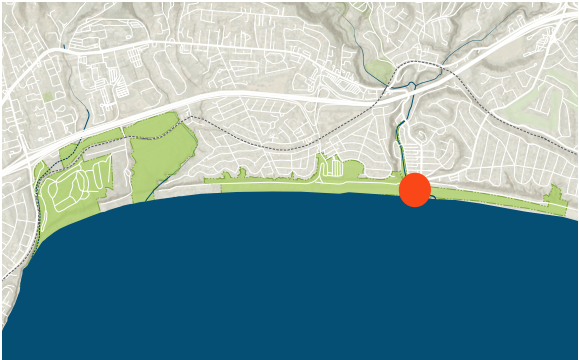
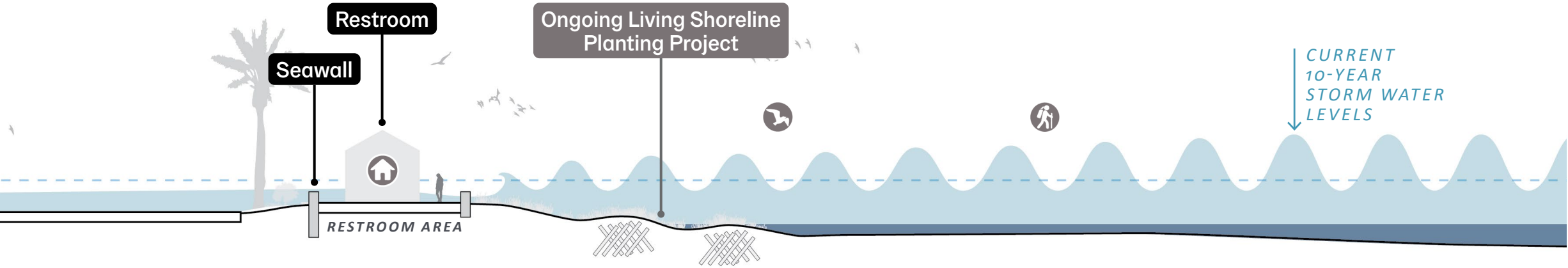


Legend

- Park Boundary
- Current 10-Year Storm Water Level

Park Assets

- Park Facility
- Public Access
- Natural Resource Area



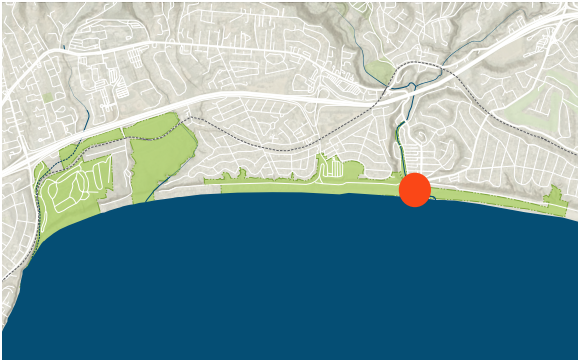
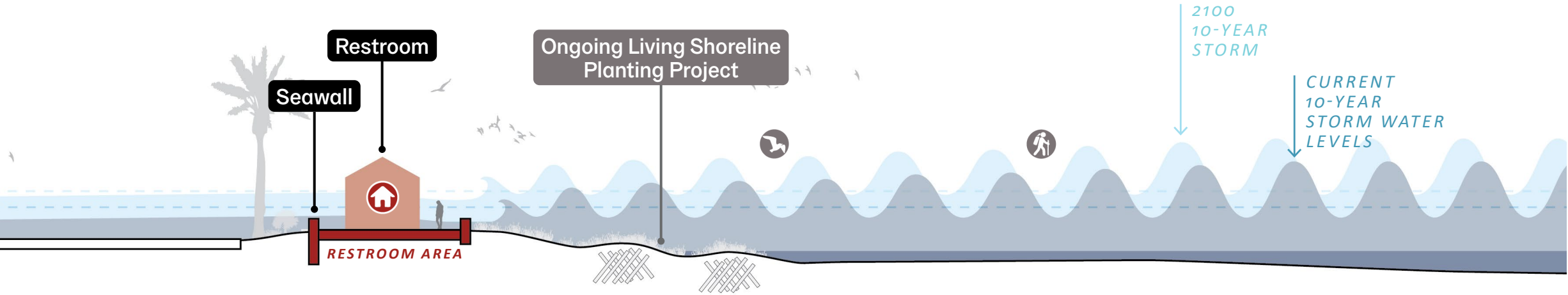
Projected Sea Level Rise Vulnerability with No Action

Rio Del Mar State Beach



Legend

- Park Boundary
- Future 10-Year Storm Water Levels**
 - 2100+: 6' SLR
 - 2070: 2' SLR
 - 2050: 1' SLR
- Park Assets**
 - Park Facility
 - Public Access
 - Natural Resource Area
 - Vulnerable Asset



Adaptation Alternatives & Timeline

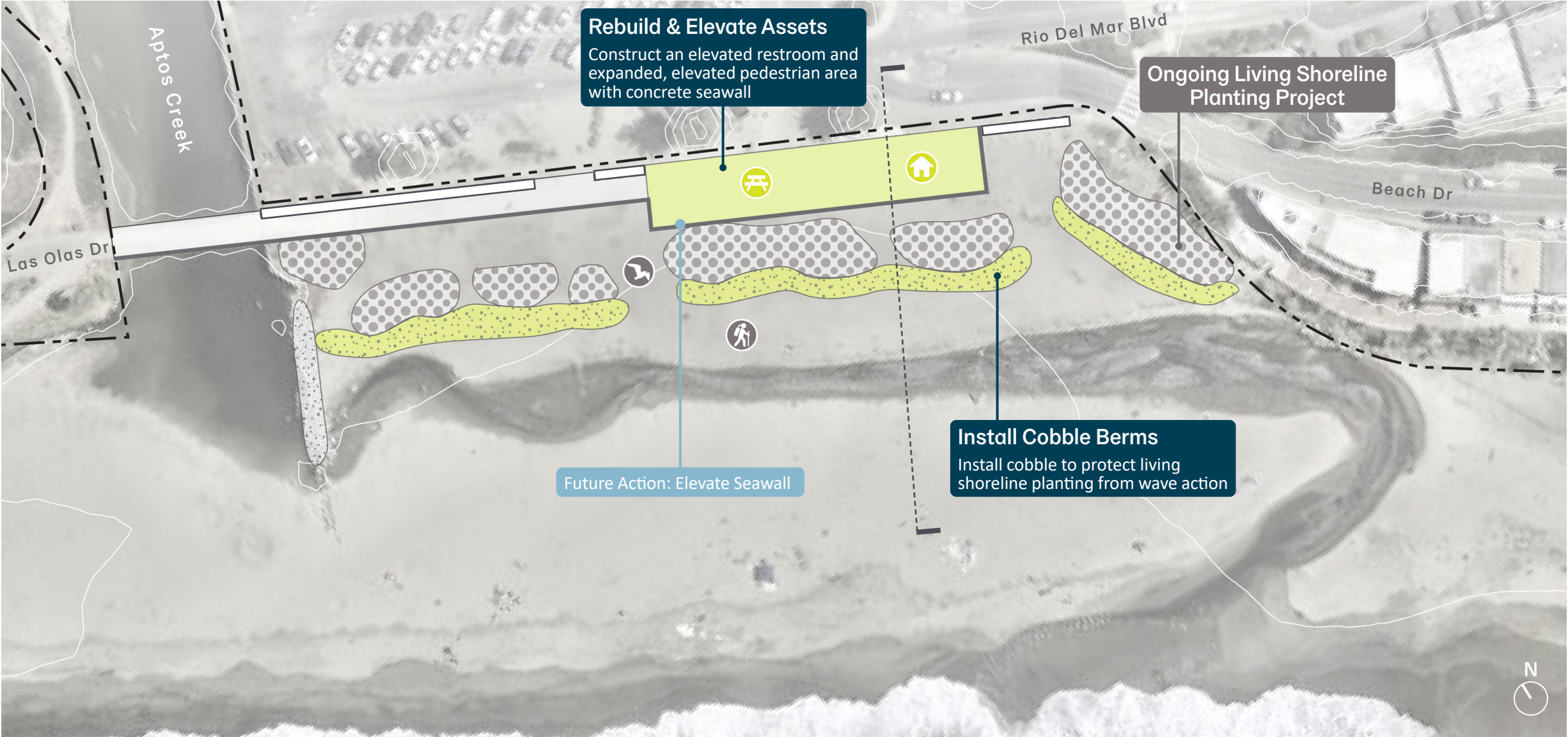
Rio Del Mar State Beach



Planning Horizon		CURRENT	NEAR-TERM	MID-TERM	LONG-TERM
Time Frame		Now	by 2050	~2070	2100+
Coastal Hazard					
Vulnerabilities without Action					
Sea Level Rise (ft)		0'	1'	2'	4-6'
10-yr Storm Probability	Annual Chance	10%	12%	16%	25-50%
	Return Interval (yr)	10	8	6	2-4
Waves		Beach, rip-rap, and restroom need cleanup and repairs	Rip-rap and restroom require significant repair	Restroom and utilities require reconstruction	
Beach Erosion					Aptos Creek bridge requires cleanup
Adaptation Strategies					
Adaptation Actions					
Fortify & Protect		- Plan for maintenance capacity - Advance funding & design of adaptations	Rebuild & elevate restroom and pedestrian area	Install seatblocks along edge of raised pedestrian area	Install seatwall along pedestrian area/ parking lot
Restore & Relocate		- Plan for change in use and access patterns - Identify asset relocation area(s); advance funding and design of new facilities	Remove restroom		
Hybrid		- Plan for maintenance capacity and reduced access - Identify asset consolidation opportunities and relocation areas - Advance funding and design of adaptations	- Rebuild & elevate restroom facility - Install cobble berms to protect living shoreline planting; infill vegetated dunes behind cobble	Replenish cobble and dunes	Replenish cobble and dunes

Adaptation Alternative: Fortify & Protect

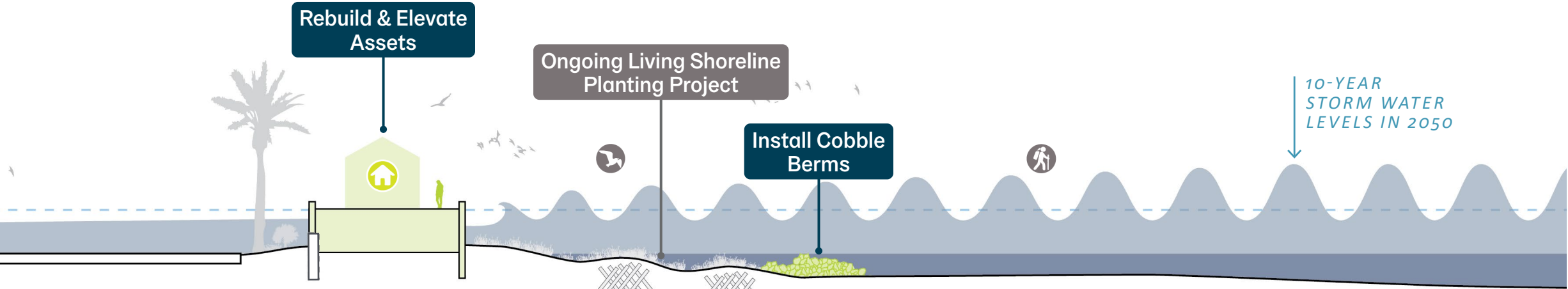
Rio Del Mar State Beach



The Fortify & Protect alternative uses grey infrastructure to secure existing infrastructure and assets, such as the parking and road. Presently, proactive planning can continue to help to build maintenance capacity and prioritize funding for adaptation to coastal hazards projected to occur in the near-term (by 2050).

In the near-term, construct an elevated visitor platform with concrete seawalls and new elevated restroom facility. Add cobble in front of the living shoreline planting project to protect the planting from wave action.

Future Action: Raise concrete seawall to protect from higher water levels.



Seat blocks; Coyote Point, San Mateo, CA



Seawall & Rock Revetment; Puerto Vallarta, Mexico

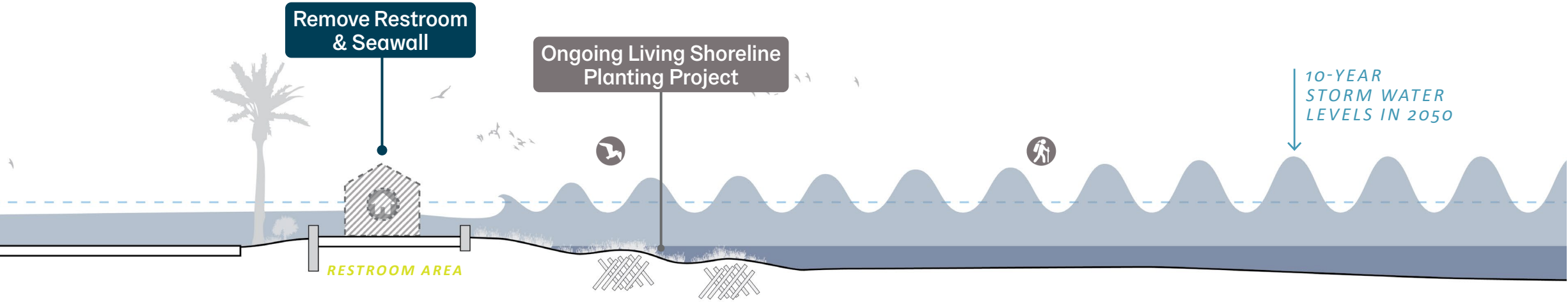
Adaptation Alternative: Restore & Relocate

Rio Del Mar State Beach



The Restore & Relocate alternative prioritizes natural resource restoration. Assets and infrastructure are relocated to make room for coastal processes. Presently, proactive adaptation planning can identify asset relocation areas and change in use and access patterns.

In the near-term, remove the restroom and seawall.



Vegetated Dune with Cobble;
Cardiff State Beach, Encinitas, CA



Cobble Berm
60

Adaptation Alternative: Hybrid

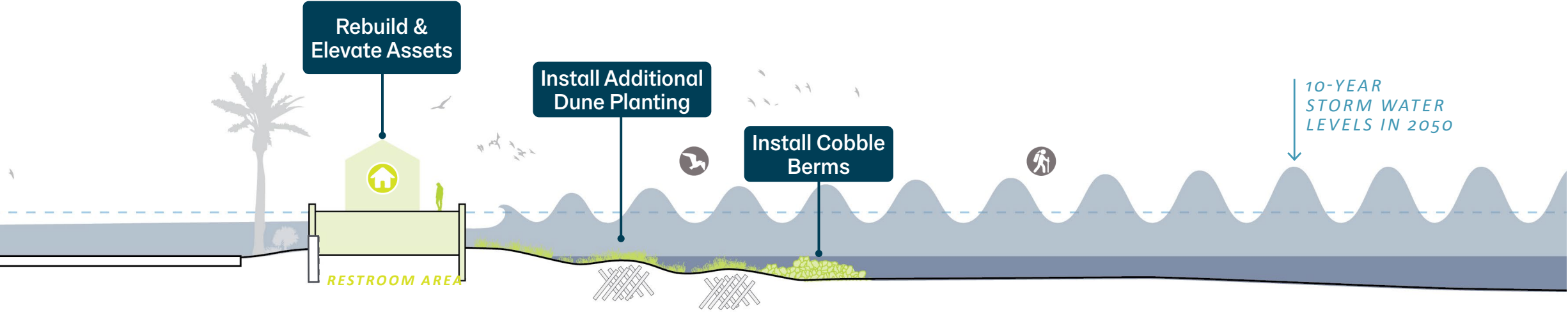
Rio Del Mar State Beach



The Hybrid alternative combine strategies to maintain assets while making room for coastal processes. It utilizes both green and grey infrastructure. Presently, proactive planning can continue to help to build maintenance capacity and prioritize funding for adaptation to coastal hazards projected to occur in the near-term (by 2050). Asset consolidation opportunities and relocation areas can be identified.

In the near-term, rebuild and elevate the restroom with concrete seawalls. Install cobble berms in front of the ongoing living shoreline project area and infill additional dune planting.

Future Action: Replenish cobble berms and dunes planting as needed.



Vegetated Dune with Cobble;
Cardiff State Beach, Encinitas, CA



Cobble Berm

Platforms at Rio Del Mar State Beach



New Brighton
State Beach

Seacliff State Beach
RV Campground

Seacliff State Beach
Day-Use Area

Rio Del Mar
State Beach

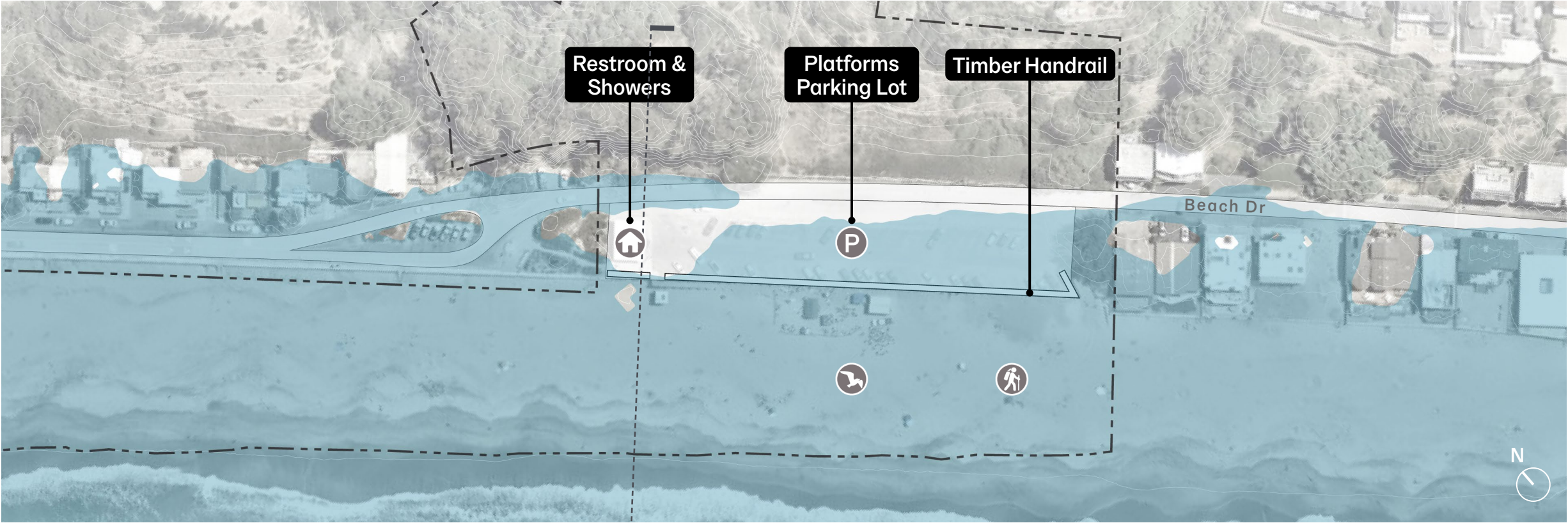
Platforms at Rio Del
Mar State Beach

PACIFIC OCEAN



Existing Conditions

Platforms at Rio Del Mar State Beach

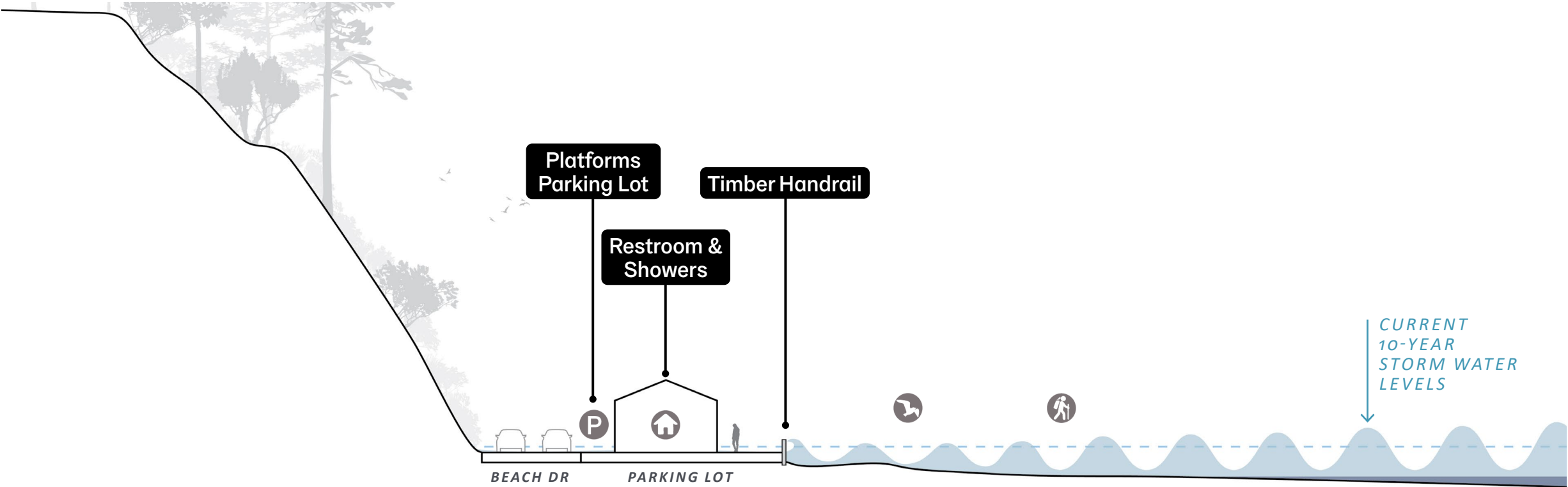


Legend

- Park Boundary
- Current 10-Year Storm Water Level

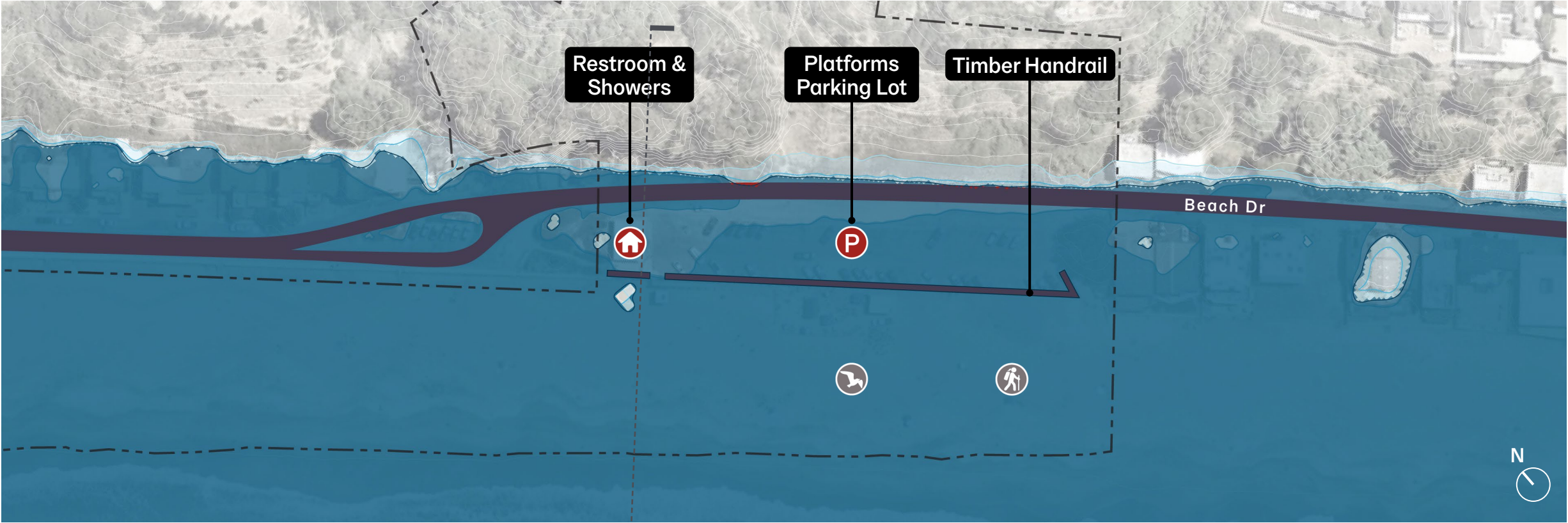
Park Assets

- Park Facility
- Public Access
- Natural Resource Area
- Parking



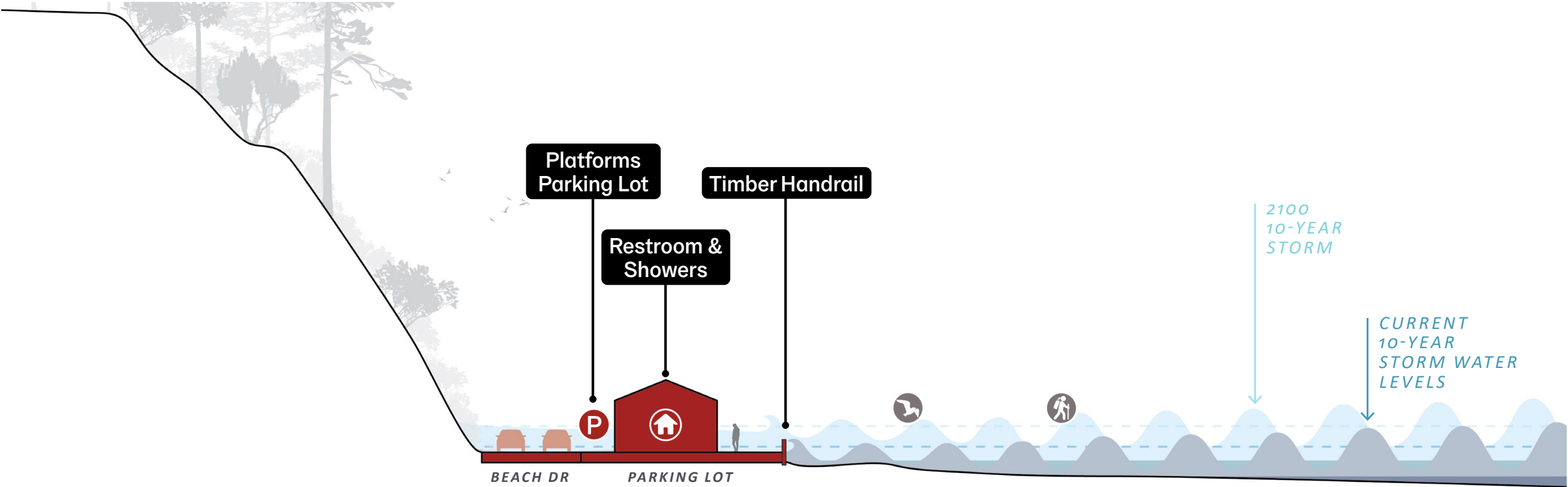
Projected Sea Level Rise Vulnerability with No Action

Platforms at Rio Del Mar State Beach



Legend

- Park Boundary
- Future 10-Year Storm Water Levels
 - 2100+: 6' SLR
 - 2070: 2' SLR
 - 2050: 1' SLR
- Park Assets
 - Park Facility
 - Public Access
 - Natural Resource Area
 - Parking
 - Vulnerable Asset



Adaptation Alternatives & Timeline

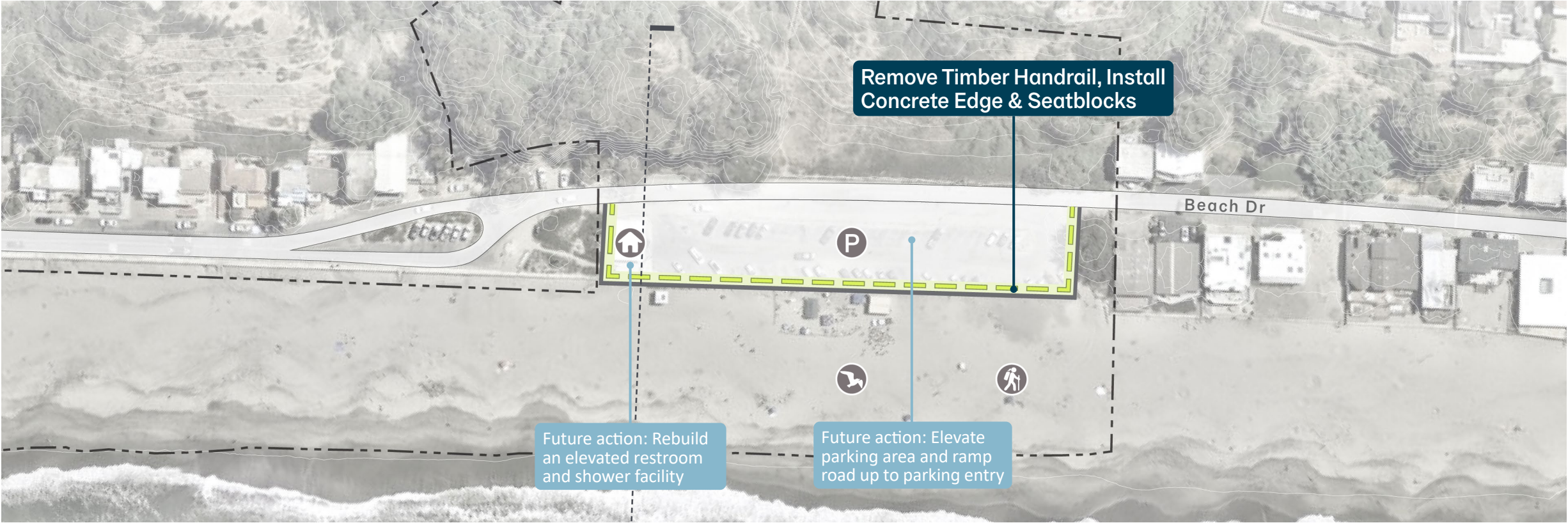
Platforms at Rio Del Mar State Beach



Planning Horizon		CURRENT	NEAR - TERM	MID - TERM	LONG - TERM
Time Frame		Now	by 2050	~2070	2100+
Coastal Hazard					
Vulnerabilities without Action					
Sea Level Rise (ft)		0'	1'	2'	4-6'
10-yr Storm Probability	Annual Chance	10%	12%	16%	25-50%
	Return Interval (yr)	10	8	6	2-4
Waves		Facilities and Beach Drive inaccessible in storms, cleanup required; beach access stairs need repairs	Beach Drive, beach access stairs and ADA ramp require significant repairs; restroom and parking require cleanup and repair	Beach Drive, utilities, beach access stairs and ADA ramp, and parking lot require reconstruction ; restroom requires significant repair	
Beach Erosion				Beach erosion compounds wave damage to assets listed above	Stormwater outlets need reconstruction
Cliff Retreat			Stormwater outlet needs significant repair	Stormwater outlet needs reconstruction	
Adaptation Strategies					
Adaptation Actions					
Fortify & Protect		- Plan for maintenance capacity - Advance funding and design of repairs and adaptations	Replace timber handrail with concrete toe wall around edge of parking area, install seatblocks	- Elevate parking area, ramp road up to parking entry - Rebuild elevated restroom and shower facility	Install concrete seatwall around parking lot
Restore & Relocate		- Plan for change in use and access patterns - Identify asset relocation area(s); advance funding and design of new facilities	Reduce parking and construct concrete toe wall around new consolidated parking area, gain sandy beach habitat	Remove all parking, restroom; gain beach habitat	
Hybrid		- Plan for maintenance capacity and reduced parking opportunity - Identify asset consolidation opportunities and relocation areas - Advance funding and design of repairs and adaptations	- Reduce parking and construct concrete toe wall around new consolidated parking area, install seatblocks - Install vegetated dune field and boardwalk trail	- Elevate consolidated parking area, ramp road up to parking entry - Rebuild an elevated restroom and shower facility - Replenish dune field	- Install concrete seatwall around parking lot - Replenish dune field

Adaptation Alternative: Fortify & Protect

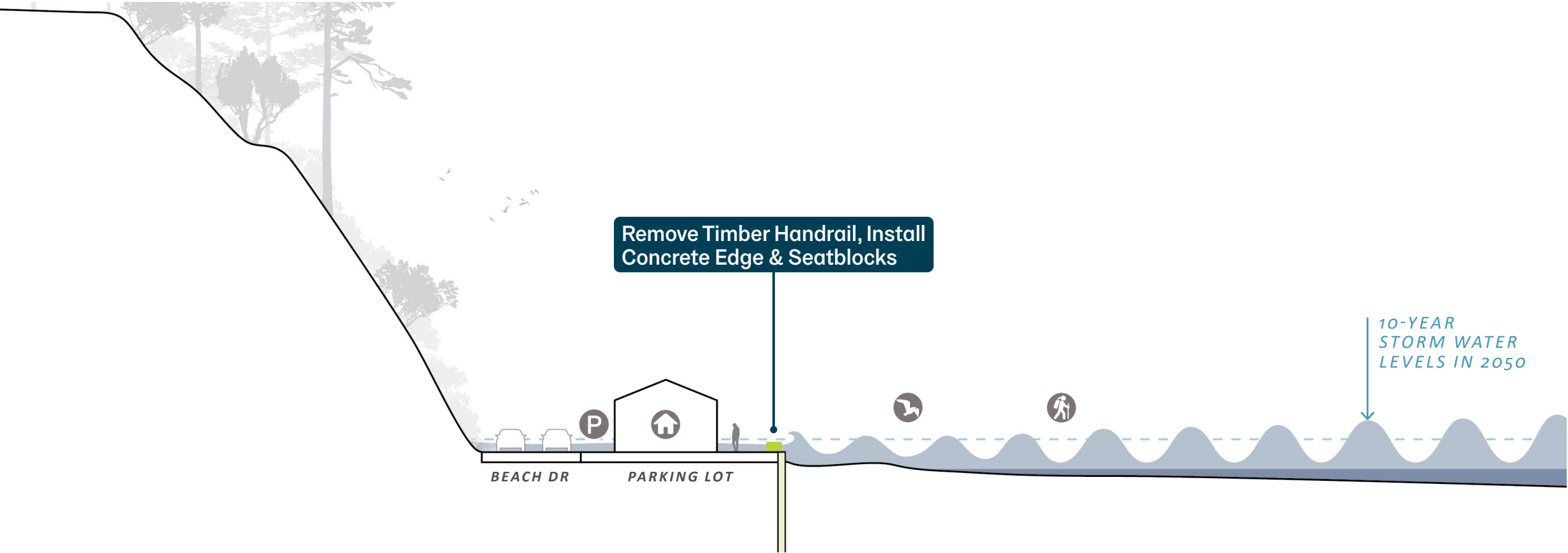
Platforms at Rio Del Mar State Beach



The Fortify & Protect alternative uses grey infrastructure to secure existing infrastructure and assets, such as parking. Presently, proactive planning can continue to help to build maintenance capacity and prioritize funding for adaptation to coastal hazards projected to occur in the near-term (by 2050).

In the near-term, remove the timber handrail and replace with a concrete toe wall and seatblocks along the edge of Platforms parking lot.

Future Action: Elevate the parking area and ramp the road up to the parking lot entry point. Reconstruct an elevated restroom and shower facility. Replace seatblocks with a contiguous seatwall around the parking lot to protect from higher water levels.



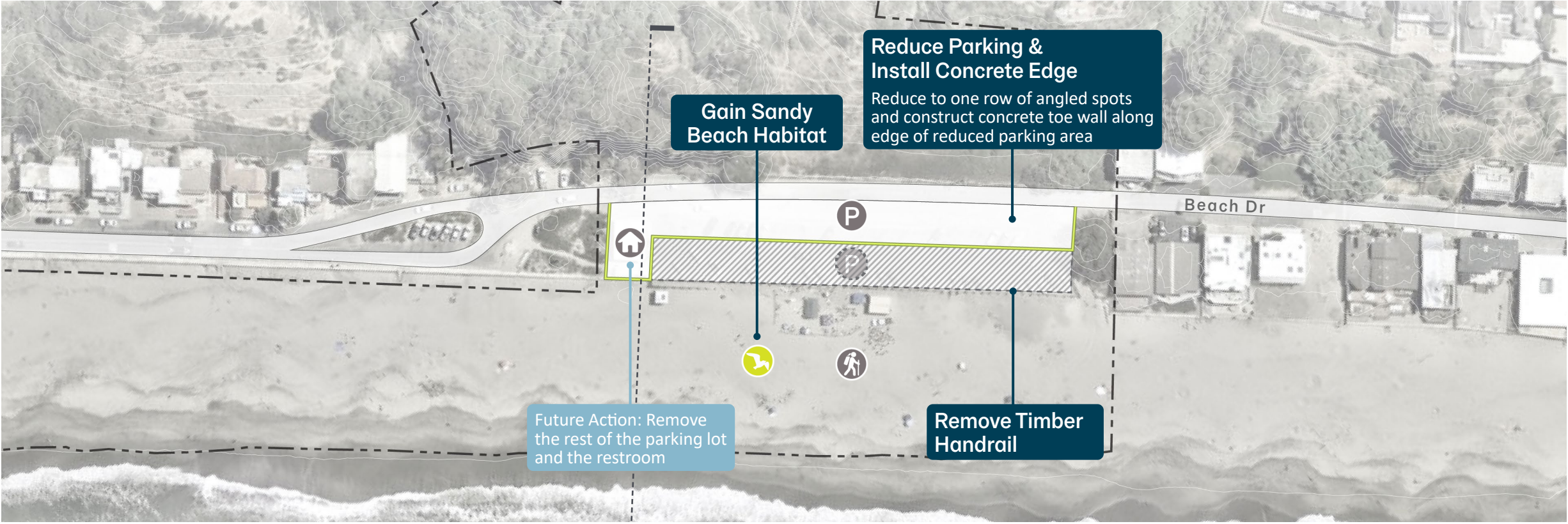
Seat blocks; Coyote Point, San Mateo, CA



Seatwall & Rock Revetment; Puerto Vallarta, Mexico

Adaptation Alternative: Restore & Relocate

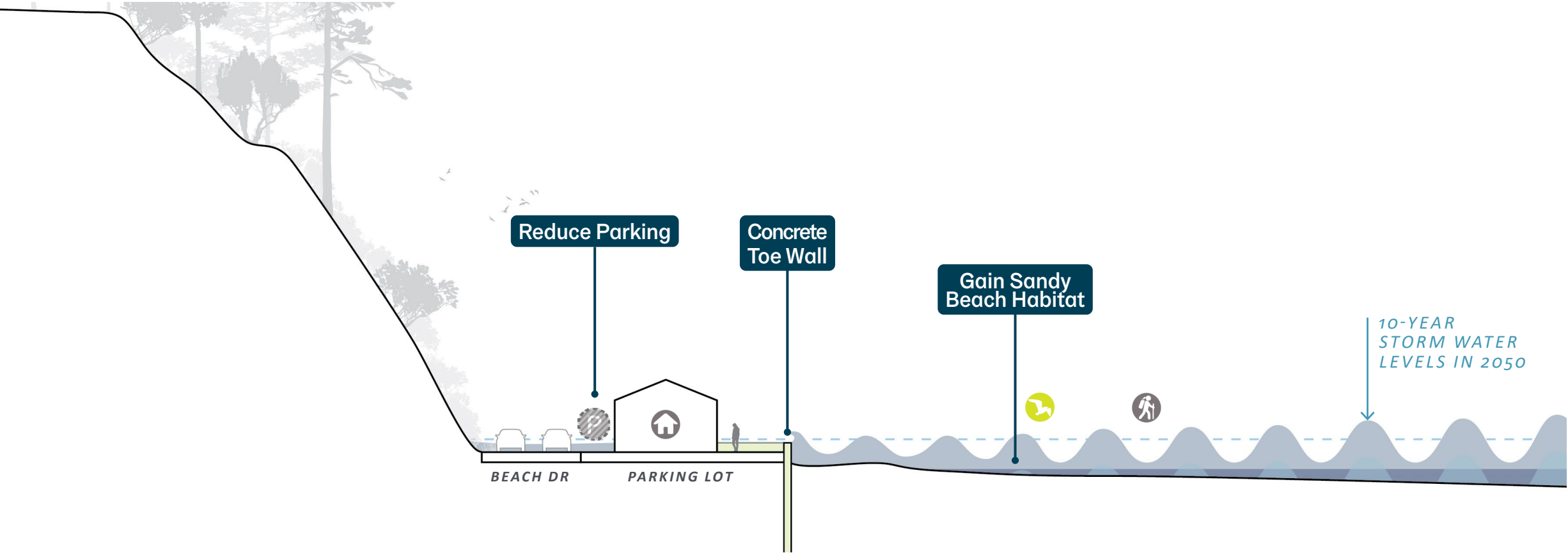
Platforms at Rio Del Mar State Beach



The Restore & Relocate alternative prioritizes natural resource restoration. Assets and infrastructure are relocated to make room for coastal processes. Presently, proactive adaptation planning can identify asset relocation areas and change in use and access patterns.

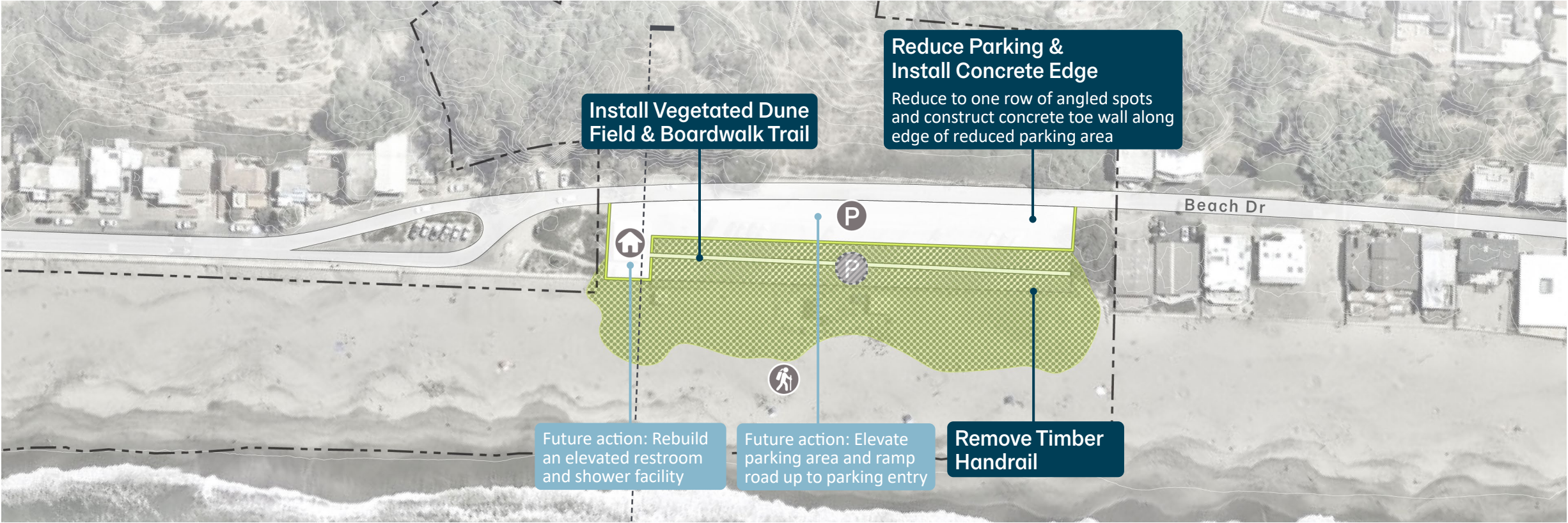
In the near-term, reduce parking and gain sandy beach habitat. Install a concrete toe wall around the edge of the consolidated parking area.

Future Action: Remove remaining parking and restroom, gaining more sandy beach habitat.



Adaptation Alternative: Hybrid

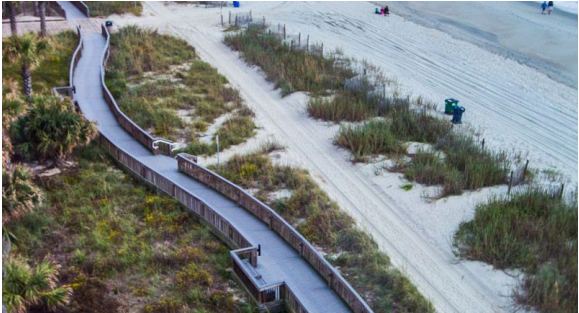
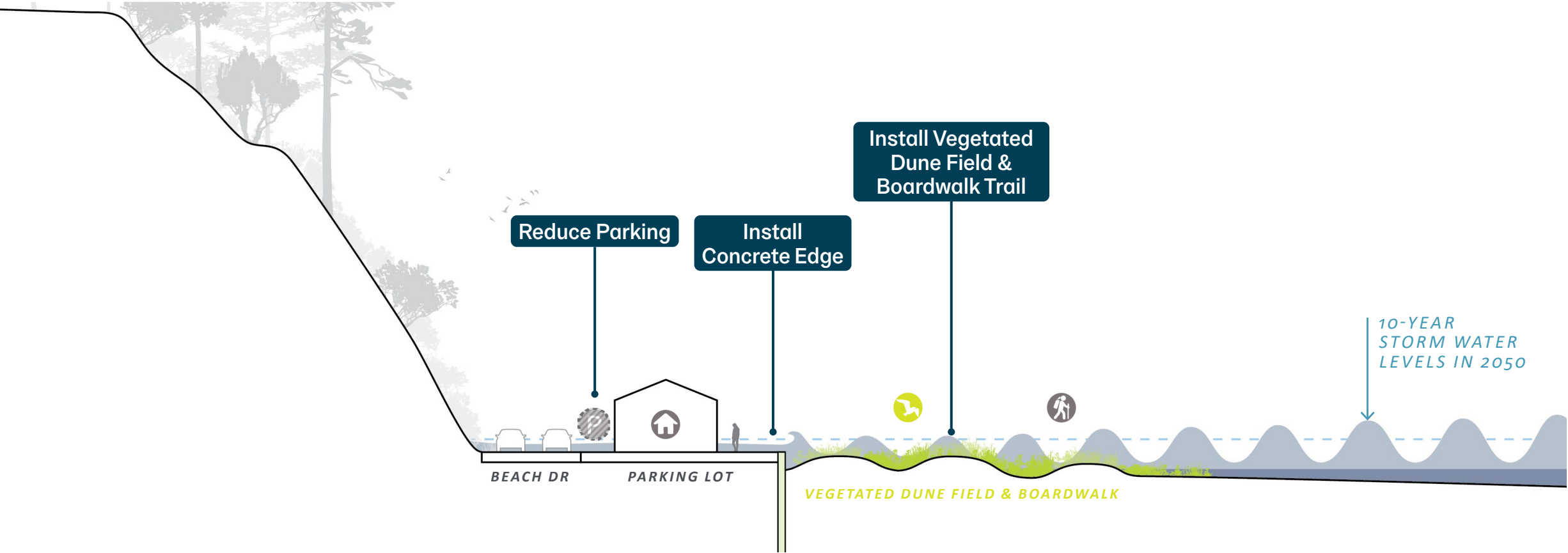
Platforms at Rio Del Mar State Beach



The Hybrid alternative combines strategies to maintain assets while making room for coastal processes. They utilize both green and grey infrastructure. Presently, proactive planning can continue to help to build maintenance capacity and prioritize funding for adaptation to coastal hazards projected to occur in the near-term (by 2050). Asset consolidation opportunities and relocation areas can be identified.

In this alternative, parking can be reduced, and a vegetated dune field installed. A concrete toe wall and seatblocks can be installed along the beachfront edge of the parking lot.

Future Action: Elevate parking area and ramp road up to parking entry. Construct a new elevated restroom and shower facility. Replenish dune field as needed.



Dune & Boardwalk Trail



Seat blocks; Coyote Point, San Mateo, CA



WAGGONNER
& BALL