

Parks and Cities Seek Shore Resilience

JOE EATON, REPORTER

For Alameda County, climate vulnerability is no abstraction. King tides push the waters of San Leandro Bay into parking lots at Martin Luther King Regional Shoreline. When Diablo winds rattle the eucalyptus, Berkeley and Oakland hill-dwellers recall the conflagrations of 1923 and 1991 and dread the next one. The county feels the bite of both edges of the climate sword: fire and flood.

Alameda is a big (739 square miles), populous (an estimated 1.7 million), diverse county: hills and flatlands, students and retirees, new money and underground artists, banh mi, birria, boulani, barbeque. It encompasses the academic powerhouse of UC Berkeley, the South County tech scene, mushrooming urban infill construction, grotesque real estate values, proliferating homeless encampments, brownfields, and former military bases in varying stages of cleanup. While some cities are skewing whiter and richer, communities of color remain substantial. There's overlap with pockets of socioeconomic disadvantage, many in low-lying bayside areas.

With highways, BART, a major airport and seaport, business parks, and sports complexes, Alameda is dense with critical infrastructure. Yet it's also rich in open space, much of it in a regional park system shared with bordering Contra Costa County, its coastal units stitched together by the San Francisco Bay Trail. Some coastal wetlands harbor endangered species. There's a lot at risk here, and cities, the East Bay Regional Park District (EBRPD), and other entities are engaging with climate adaptation on multiple fronts.

Parks at the Forefront

With 58,713 acres and 426 miles of trail in Alameda County alone, the EBRPD is the largest landowner on the shoreline and plays a large role in adaptation planning. District policy gives precedence to science-informed and nature-based climate solutions, and management is also attuned to social equity issues. "What is being protected by our levees, trails, and wetlands is largely the flatlands, with more

disadvantaged communities than the East Bay Hills," observes government affairs manager Erich Pfuehler. He adds that EBRPD has encouraged the San Francisco Bay Restoration Authority to focus on equity issues in the East Bay in allocating funds from 2016's Measure AA regional parcel tax.

The park district's Alameda County portfolio includes two Restoration Authority funded projects: Encinal Dunes in the city of Alameda, and Coyote Hills in the south county, where ambitious plans are afoot. "Coyote Hills will be a climate-smart park," says district deputy general manager Ana Alvarez. "It's located in the city of Fremont, but visitors come from other areas, like Newark, with large economically disadvantaged populations." In the works are riparian forest restoration to sequester carbon, expanded seasonal wetlands to increase floodwater storage capacity, and an interpretive program that speaks to climate change.

For its 47 miles of Bay Trail, EBRPD has begun assessing risks and prioritizing projects, with funding from Caltrans through 2017's transportation-infrastructure-focused Senate Bill 1 (see p.3). Engineer Jack Hogan of Arup, one of several consulting firms involved in the planning project, points out that there's more to the trail than recreation: "It wasn't designed to provide shoreline flood protection, but it is the de facto protection in some areas."

His team has used a number-crunching approach to help EBRPD choose which trail segments to tackle first, weighting each section on hazard, vulnerability, and consequences. EBRPD has yet to decide on priorities, but from what chief of planning Brian Holt says, segments along the Oakland Estuary could well make the cut: "It's an area of concern — endangered species at Arrowhead Marsh, I-880, the port and airport, buildings that come right up against the shoreline."

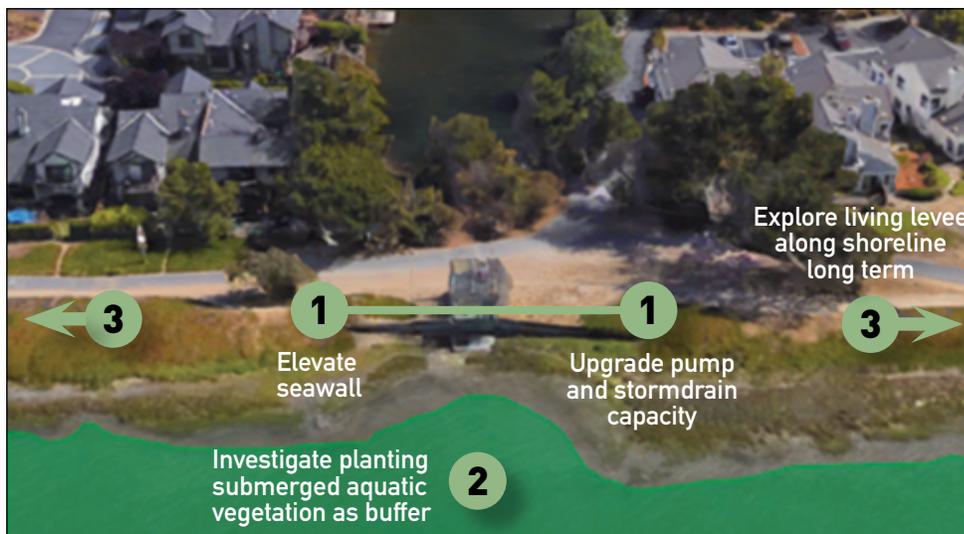
Looking for Lines of Defense

Worries about a rising Bay flooding the cluster of roads, utilities, and endangered species habitats on a long stretch of Hayward shoreline put the area on planners' radar more than a decade ago. Since then it has served as a micro-regional planning pilot for how to assess risk and adapt.

The Hayward Area Shoreline Planning Agency (HASPA), a new joint powers authority composed of local park districts and municipalities, is developing a Shoreline Master Plan with SB 1 funding. Regional park units include the Hayward Regional Shoreline, with its popular interpretive center, and a preserve for the endangered salt marsh harvest mouse.

Earlier this year a team of consultants led by New York-based SCAPE presented three potential strategies for

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Alameda's resilience plan explores options for spots vulnerable to sea-level rise such as this lagoon inlet on Bay Farm Island.

review by the project's stakeholders. Alternative options for placement of the "line of protection" against rising tides were dubbed "Closer to the Bay," "Down the Middle," and "Further Inland." A preferred alternative, likely incorporating elements from multiple plans, will be chosen later this year after stakeholder feedback.

HASPA's Taylor Richard says two options aren't currently on the table in planning for a projected four-foot sea-level rise: armoring the shoreline and managed retreat. "At seven feet or higher, maintaining structures may become unfeasible. But in the

timeframe we're looking at managed retreat isn't likely — it's too far out there," she says. "One of our goals is to build resilient communities. The plan, in the timeframe we're exploring, is to protect housing."

All three proposals involve some realignment of the Bay Trail, with two moving it significantly farther inland. When that was suggested by the Adapting to Rising Tides program of the SF Bay Conservation and Development Commission (BCDC), the idea generated pushback as incompatible with the "blue water experience" valued by trail users. Agency planners

and stakeholders will be discussing tradeoffs. "We'll get together with our Ouija boards and crystal balls and figure it all out," jokes city of Hayward planner Damon Golubics.

Sometimes a line of defense can be crafted with nature-based materials. Near the HASPA project area, the Coastal Conservancy is moving forward with a gravel beach and berm at the Eden Landing Ecological Reserve. The project, supported by a National Coastal Resilience Grant, was an element originally developed by SCAPE and others working to unlock Alameda Creek in the 2018 Resilient by Design challenge.

Using coarse-grained material like gravel, the beach and berm will help stabilize the outboard levee at Eden Landing. Project manager Laura Cholodenko says information from similar projects at Aramburu Island in the North Bay and Pier 94 in San Francisco was reviewed to help inform the design. "The 300-foot beach is a pilot project," she explains. "If it performs well and provides erosion protection, we can scale it up and install it along other areas of the levees." The project, now early in the permitting process, would provide roosting and foraging habitat for sensitive bird species like the California least tern and western snowy plover (see *Estuary News* June 2018).

Considering Equity

Meanwhile, in revising an older climate action plan, the City of Alameda is investigating how groundwater may compound future flooding. Groundwater is also an emerging concern in East Oakland, where research reveals the potential for dangerous interactions with soil contaminants.

The City of Alameda's Climate Action and Resiliency Plan is unusual in its attention to the increased risk and social equity implications of flooding. Climate resiliency consultant Lauren Eisele, an Alameda resident, says that the island city's original climate plan emphasized greenhouse gas emissions and was not completely implemented. She and other members of Community Action for a Sustainable Alameda (CASA) pushed for a revision.

A new plan was developed by Boston consulting firm ERG. Mapping social vulnerability with an index from BCDC, the plan reported that some of



"Down the Middle" line of flood protection. One of three options in the Hayward shoreline adaptation plan. Map: SCAPE

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ALAMEDA COUNTY, *cont'd from page 30*

Alameda's neighborhoods at near-term risk of flooding from sea-level rise are among the most vulnerable in terms of income, housing, health, and English-language skills. Alameda's bridge-and-tunnel links to Oakland and existing hardened shoreline infrastructure pose challenges to adaptation, but the plan proposes nature-based solutions (living shorelines, wetland restoration) for other areas. "Several of the major adaptation projects will require increases in local funding, as well as federal and regional grants," says longtime CASA leader Ruth Abbe.

The influence of sea-level rise on groundwater levels was not included in the plan's flooding vulnerability assessment; the city of Alameda has hired Christine May of Silvestrum Climate Associates to fill this gap. Rising seas could push groundwater up, encroaching on pipes and basements and emerging to flood the surface, according to another expert, UC Berkeley's Kristina Hill. Using data on wells along the Bayshore, Hill, May, and UC researcher Ellen Plane mapped potential groundwater flooding hotspots. In a 2019 article, they reported significant potential for groundwater flooding in parts of Oakland, Hayward, and Fremont, including Interstates 580 and 880 and the Oakland airport.

Flooding is only part of the risk. Hill and her students just completed a

survey of historic contamination in East Oakland, identifying a dozen or more sites where rising groundwater could mobilize contaminants, some of which are no longer being monitored by the SF Bay Regional Water Quality Control Board. Groundwater can also contribute to seismic risk through soil liquefaction, particularly in areas of Bay fill like West Oakland and Alameda.

Hill says regulators and climate adaptation planners have overlooked groundwater. That's changing, though: groundwater is being incorporated in the Adapting to Rising Tides database, and a current collaborative proposal could fund more comprehensive mapping through a Bay Planning Coalition adaptation grant.

While rising seas threaten coastal assets, EBRPD and the cities are bracing for ever-lengthening fire seasons. The East Bay Hills are a type specimen of the wildland-urban interface areas common throughout the drying West. "Our fire chief is very concerned about Tilden Regional Park" on the Alameda/Contra Costa line, says Holt. "In Oakland, the area of the 1991 Tunnel Fire has historically burned every 20 to 30 years," he says. EBRPD's Wildfire Hazard Reduction and Resource Management Plan, adopted in 2010, had a long and tortuous path to implementation, complicated by changes in regional partnerships and litigation over eucalyptus removal. "We have a thinning plan for eucalyptus," Holt explains. "It's not practical to remove them all."

Funding all these projects will be more challenging than anyone could have imagined a few months ago, with state and local budgets stressed by pandemic response. The City of Alameda has delayed the hiring of a resiliency manager and postponed an infrastructure bond and other revenue measures, according to CASA's Abbe. "In the face of COVID it tends to look a little grim," Hayward's Richard notes. "But it's really long-range. We have a lot of time to pursue grant options, look at different funding sources." Richard and Golubics are looking at Restoration Authority funding for Hayward.

Another resource may be the EBRPD's Green Bonds, which can be used for adaptation, as well as other purposes. The district's vegetation clearance for wildfire risk reduction was funded in a special-district measure 16 years ago; the district is now advocating for more funding and personnel.

Pfeuhler has heard talk of a possible state climate stimulus bond initiative for a future ballot. For now, he says he'd like to see better regional coordination to support adaptation to the heightened risks of fire and flood: "We need to figure out a way to address funding that's more holistic, less piecemeal."

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