CLIMATE ACTION AND ADAPTATION TASK FORCE

December 19, 2023 – 6:30 PM
Pacifica Police Department, EOC
2075 Coast Highway, Pacifica, CA 94044

AGENDA

I. Call to Order (10m)

Roll Call
Approval of Agenda (requires majority vote)
Approval of Minutes (requires motion and second)

II. Community Communications (TBD)

Public Comment - *This portion of the agenda is available to the public to address the Task Force on items not appearing on the agenda. Statements are limited to three (3) minutes.*

III. Task Force Communications (10m)

Announcements from Task Force Members and updates from delegates

IV. Staff Communications (5m)

Updates and Announcements from City Staff

V. Discussion and Action

Item 1: Receive Adaptation and Resilience Introductory and Nature Based Solutions Introductory Reports **(Staff) (15m)**
Item 2: Review and Approve Roadmap Action Detail **(SAS) (20m)**
Item 3: Receive Law and Policy Topics **(PRRS) (15m)**
Item 4: Provide Feedback on the Draft Survey Questions and Discuss Next Steps to Conduct the Survey **(COS) (20m)**
Standing Item: Formation/Updates to Subcommittee(s) **(Chair) (5m)**

VI. Future Meetings (5m)

Determine potential future agenda items

VII. Adjournment

Next Regular Meeting: January 16, 2024, subject to change

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CLIMATE ACTION AND ADAPTATION TASK FORCE

November 21, 2023 @ 6:30 PM
Pacifica Police Department, EOC, 2075 Coast Highway, Pacifica, CA 94044

DRAFT MEETING MINUTES

Call to Order:

6:31PM by Fellow Trevino

Roll Call:

Members Present:

Maria Barr, Kimberly Finale, Kai Martin, Monica Meagher, Margo Meiman, Rick Nahass, Dave Plumb, Carl Schwab, Jake Scussel, Nancy Tierney

Members Absent:

Cindy Yang

Staff Present:

Elizabeth Brooks - Management Analyst II
Gabriel Trevino - CivicSpark Fellow

Approval of Agenda:

Nahass inquired about the timeline between receiving agenda packet items and approving them, specifically regarding the Milestone Framework

- Chair Monica Meagher explained that while that will be the typical timeline for reviewing an agenda packet item, if more time is needed to approve an action item then more time can be allotted for that. Chair Meagher then made the distinction between the current agenda and the approval of the previous meeting's agenda.

No objections to approve the agenda

Approval of October 17, 2023 Minutes:

Vice Chair Kai Martin requested to change the minutes of the October meeting in regarding the spelling of a community member's name.

- Kenny Pollak to be adjusted to the spelling "Cami Pawlak"

Chair Meagher moved to approve the minutes as amended, Tierney seconded. The motion passed unanimously.

Community Communications:

No community members were present at this meeting.

Task Force Communications:

Meagher: Chair Meagher requested that Task Force member communications be limited in time in order to stay on schedule and be anywhere from 30 seconds to a minute.

Martin: Reminded group that this would not be report outs from Subcommittee groups, but perhaps what was done as an individual. Vice Chair Kai Martin

had nothing to report.

Nahass: Attended two RICAPS meetings: one meeting about vehicle Electrification and the other meeting being about cities adopting a resolution to abide by certain RICAPS goals. He requested information on the City's Reach Codes.

Finale: Attended Youth Advisory Board meeting, went as a representative of this Task Force and sought their involvement in some capacity. Also attended both RICAPS meetings. Attended a City Council meeting, sought Councilwoman Bier's support to engage with resources through the Pride celebrations.

Meiman: Attended the EV Expo, also discussed targeted postcards to customers that still have gas appliances in their homes. Goal is to convince them to switch away from gas appliances, were able to send more than 400 postcards via another climate activist group outside of the Task Force.

Tierney: Also attended the second RICAPS meeting.

Meagher: Via her day job working for BART, she participated in the Bay Area Regional Climate Action Planning Initiative, as hosted by the Bay Area Air Quality Management District. Sought funding via the EPA's Climate Pollution Reduction Grant, and examined transportation mode shift and residential building electrification. Focus on mobility hubs as the main avenue for funding. Attended Local Energy Resource Network meeting, would be good to look to this source for funding opportunity knowledge when we get to that part of the CAAP Project. She then answered Schwab's question regarding Brown Act and how many members of the Task Force are allowed to all attend various upcoming meetings.

Staff Communications:

Trevino: Summarized the agenda packet items. The first being resources regarding the San Mateo County Climate Summit. The following was regarding the October 30th communications report which addressed questions about the RICAPS Rincon Inventory, such as which tools are used, scope emissions tracked, and verification of greenhouse gas emission inventories. The following item was described as a report detailing answers to the questions from the initial communications report, as provided by Ryan Gardner and representatives from Rincon. The final document summarized was the RICAPS meeting notes regarding the Gov EV Fleet Program via PCE.

There was then discussion between City Staff Elizabeth Brooks to Meagher, Tierney, Nahass, and Finale regarding how many people are allowed to go to RICAPS meetings in reference to the Brown Act limit, and between the primary

contacts and alternates who should be in attendance for the in person December RICAPS meeting.

Trevino: Described the Rincon Inventory for the 2021 year, as well as a manual analysis he conducted of data provided by the California Energy Commission on total number of vehicle fuel types registered in Pacifica for 2023. He said that if Task Force members would like to view the report, it will be appearing on the CAAP Intranet after the meeting ends. Pointed out that according to the California Energy Commissions Vehicle Infrastructure data, only around 3.5% of cars registered in Pacifica are fully zero emission.

Discussion:

Item 1: Approval of Scope for Pacifica's Climate Action and Adaptation Plan

Meagher and Brooks handed out the print out materials regarding the Scope Statement Alternatives, while Trevino described the color coding of the scope statements to the group. He described that green highlighted portions of the scope statements are what were agreed upon and necessary components of the scope; yellow highlights are what he added to flesh out the scope statements; finally, the light blue highlighted portions are where there could be room for significant changes to terminology or rhetoric.

Tierney: Noted her personal preference to the group that the language of the scope may be improved by substituting the phrase 'Pacifica aims to..' with 'Pacifica is committed to..' or something along those lines. Also suggested staying away from language such as 'embarking', 'journey', and to overall avoid a poetic tone and focus on an active voice.

Martin: Built upon Tierney's ideas, and suggested Scope Statement Alternative 3 as his personal choice. He also reminded the group that whatever choice is made can be amended based on how the goals of the Task Force may change.

Tierney: Asked the group if they would like to go through and wordsmith each one, and if that is really the best use of time for the meeting, or if the group would prefer to choose the Scope Statement Alternative that is 'closest to' the best and amend it further going forward. Then asked about the varying terminology used to differentiate more aggressive goals from more passive ones. Trevino responded that what was signified by this difference was primarily for the purpose of exceeding the bare minimum standards for greenhouse gas emission reduction targets.

Martin: Suggested that the changes proposed by Fellow Trevino in the yellow highlights can additionally be thought of as goals related to timelines in comparison to CARB timelines.

Meagher: Responded to Tierney's timing question by notifying the group that 20

minutes could be allotted to this activity in order to stay on schedule. There was then discussion between Meagher, Martin, and Fellow Trevino for the whole group as to how to move forward with choosing an alternative that most people could agree on is closest to the desired outcome, and for Staff to then receive feedback on it and to organize for the following meeting. Trevino then suggested that according to the presentation structure, an alternative could be discussed briefly and voted out as the weakest option upon individual examination.

Meiman: Asked Trevino about how he would characterize each of the alternatives since he wrote them and should know them the best. To this question Trevino answered that there are mainly just differences in rhetoric, terminology, active voice, and goal assertiveness.

Plumb: Had a concern about how nature based solutions fit into the scope of the plan, and how much of an impact that is having. To this, Martin responded that nature based solutions are part of the problem, so while a larger issue such as transportation may be the focus due to its large contribution to the total greenhouse gasses emitted in Pacifica, action should be taken in all sectors as as much as possible. Meagher built upon this statement to remind the Task Force that this project is inclusive of adaptation, so action should be taken to be ready for other impacts from climate change. More discussion was had regarding the commitment to nature based solutions going forward as a means to impact the total amount of greenhouse gasses coming from Pacifica and how to mitigate that via natural pathways.

Nahass: Suggested word changes between alternatives, and substituting passive terms such as ‘compass’ for ‘blueprint’. Additionally suggested and questioned the use of ‘health’ as compared to ‘public health’. To this Trevino responded that in the initial draft of the scope statement, ‘health’ was left intentionally broad. Martin built on this to say that ‘health’ here means human health, nature health, etc.. Meiman suggested blueprint, guide, framework all as terms in substitute of compass.

Meagher: Took a vote on the alternative to move forward with on wordsmithing. Majority vote for alternative 3. Further discussion about shortening or eliminating sentences to clear redundancies, and about action defined in the scope such as consumption based analysis. Meiman and Plumb suggest other revisions regarding terminology, sentence structure, and how to best proceed.

Martin: Reminded the group that some of the directives outlined in the scope, while being agreed upon now, are to be carried out later in the process of the entire project. Discussion involving Meiman, Nahass, Meagher, Martin, Plumb, and Tierney around some actions being completed now, then other actions later, and then separately an implementation plan. Brooks reminded the group that per

the directives of City Council, implementation is not in the purview of the Task Force but can be requested to include some sort of implementation plan.

Finale: Pointed out that success in a plan is marked by the carrying out of said plan. Meagher directed attention to the screen where Trevino was conducting live edits during the discussion to the scope statement. Trevino added 'monitoring' as a term included to address Finale's comment.

Kai motions to approve the living scope statement and following edits. Barr seconds the motion.

Item 2: Subcommittee Updates

a. Strategy and Actions Subcommittee

i. Approval of ICLEI 5-Milestone Framework

Martin: Describes 5 Pathway model and circular economy, recommended we use the older 5 Milestone Framework model as we are not yet at a point where Pacifica needs to discuss a circular economy. Reminded the group that RICAPS uses ICLEI, and that the 2014 Pacifica CAP uses this framework, and all of San Mateo County uses ICLEI. Then presented the framework model and the various stages, ranging from in Milestone 1: Initiating and detailing the following necessary steps. Steps involved assessing what the City has accomplished, and to start developing goals, actions, drivers and constraints, etc..

Nahass: Asked a clarifying question about which step of the 5 Milestones we will be starting in. Martin suggested that since we are not at a place in the project where we are ready to implement action measures, we need to conduct an analysis of what has been done already by the City (Milestone 5) and begin the goal setting and determining drivers, constraints, stakeholders, etc. that are part of Milestone 1 and Milestone 2. Schwab built on what Martin was saying by describing how through his research there was not a particularly prescriptive plan for doing a project like this, and that ICLEI was the closest and seems to be the worldwide standard.

Meiman moved to approve the recommendation by the Strategies and Actions Subcommittee, Barr seconded the motion.

ii. Receive Information on GHG Inventory and Roadmap

Martin: Described what is displayed on the presentation screen, which was a color-coded roadmap of suggested action items per Subcommittee to complete per month. Colors correlate to the Strategies and Actions Subcommittee (SAS), the Community Outreach Subcommittee (COS), etc..

Martin acknowledged that the presentation of certain items were done out of order, so what he is currently presenting on is information pertinent to the

following section titled ‘Provide Direction on Roadmap Tasks to All Subcommittees’

Martin: Highlighted specific actions per Subcommittee by month, and walked the group through how to properly read the roadmap resource. Meagher answered Nahass’s question as to whether this will be on Sharepoint. She also reminded the group that this resource document is not something that specifically requires any action, but more serves as an informational walkthrough of the type of work each Subcommittee should be doing, for instance the COS. Martin then asked who is the chair of COS, Finale responded she is, and they deliberate on what the possible actions they should begin working on for the upcoming month could be. Provided examples of work that can be done on behalf of the COS to present information on or an update on the following month. Also proposed the idea of hosting RICAPS at meetings in later months to compare what RICAPS says to what the framework is instructing.

Finale: Requested data points to use to present to folks they may engage with via COS. Martin requested from COS a list of identified community issues to talk about. Asked specifically for a draft survey to discuss at the December meeting. Finale asked the group about the possibility of the City of Pacifica, or possibly City Council, issuing a written commitment to climate protection as a way to support the work that COS engages in.

iii. Provide Direction on Roadmap Tasks to All Subcommittees

Martin: Once again acknowledged that what is being presented at this point in time should have been in the previous section according to the published agenda. Provided an update to the Task Force that Staff and SAS met with Rincon, and they will do the inventory every 2 years. They will provide a 2023 inventory and finish around Q1 of 2024. Informed the Task Force that Rincon back-corrected some data all the way from 2010 to make data points more accurate, incorporated methane leakage, changed methodology for offroad transportation emissions to be more accurate in alignment with CARB, and other methodologies. Mentioned that Rincon is supposed to provide a menu of measures to Trevino, as well as forecast data.

Trevino: Added information about the SparQ Tool provided by Rincon and about waiting to hear back from them.

b. Community Engagement and Outreach Subcommittee

i. Event Attendance Planning

Finale: Notified the Task Force that COS met on November 4th, and agreed that despite many conversations regarding how to engage the public in a meaningful way so that they feel informed and ready to switch to building electrification, there are not many resources organized accordingly to easily support that transition.

COS discussed lack of a central location for information regarding rebates, funding programs, etc.. She pointed out that there are many factors to consider such as city programs, county programs, state programs, and federal funding etc.. Her recommendation was for the City to create a centralized website portal for residents to explore funding and rebate opportunities so they may be better informed, thus more willing, to electrify their homes. Additionally discussed lack of excess green waste resources for residents, and lack of Social Media presence for City of Pacifica regarding the CAAP.

Meagher: Built on the idea of an advisor, and suggested that City Staff sit in on COS Subcommittee meetings. Trevino suggested for this role. Martin supported this idea, so that way incorporating a City Staff will help all moving parts be more conjoined with every Subcommittee's actions.

c. Policies and Regulations Research Subcommittee

Meiman: This subcommittee had been researching which environmental regulations may influence the work of the CAAP, both state and federal. Over 100 state regulations alone, via CEC, CARB, etc. covering multiple categories such as sea level rise or electrification, etc.. Described that the challenge is how to determine which pieces of legislation will be most important to communicate to the Task Force and how much is usable information

Martin: Requested City Staff to research if other cities have a database similarly structured to inform the group. Meiman continued to say that of these 100 state regulations and agency rules, there are going to be 10 to 15 that are consistently relevant and impact the work the CAAP Task Force does. Meagher suggested flagging the regulations that directly impact greenhouse gas emissions since that concerns the primary objective of the Task Force.

Item 3: Consideration of Any Changes or Additions to Subcommittee Assignments

Meagher: Reminded the group of the time constraints, and moved on to the next agenda item. Meagher and Martin discussed introduction of the Research and Data Analysis Subcommittee (RADS or RDAS) as a way to put together statistics on how the City of Pacifica has done in certain areas regarding greenhouse gas emissions, so that way Subcommittees such as COS will be able to communicate that at events.

Nahass motioned to establish the RADS or RDAS. Meagher seconded the motion.

Meiman: Asked for clarification on the role of this Subcommittee, and specifically to review the 2014 CAP and determine how far the City has come in certain goals.

Meagher volunteered to join the Subcommittee, as well as Nahass, Tierney, and Finale. Tierney discussed how the Policies and Regulations Research Subcommittee may not need to operate for much longer after completing a compiled list of relevant laws. Barr volunteers to join COS.

Item 4: Consideration of Applying for Membership to ICLEI

Trevino recommended that the City pursue a membership for ICLEI. Summarized some of the feedback received from other municipalities regarding ICLEI, including a membership services call, access to other funding sources such as from the private sector, tools regarding emissions forecasts, etc..

Martin motioned for City to join. No objections to the motion.

Lastly, Meagher reminded all members of the deadlines regarding when to send resources to City Staff to add to the agenda.

Very briefly, Tierney summarized the Office of Planning and Research and their interest in coming to Pacifica to explore the Climate Resilience Plan Alignment Toolkit. OPR would like to partner with the City of Pacifica via community workshops, regarding topics such as what resilience is, adaptation and maladaptation, funding sources, etc.. Brooks promised to follow up on the proposal and circle back to Tierney.

Adjournment:

Adjourn at 8:37pm

Next Meeting:

Dec 19, 2023

V. Discussion and Action

Item 1a: Adaptation and Resilience Introductory Staff Report

Definitions and Examples

Importance of Planning

Adaptation Strategies

City of Pacifica

Climate Action and Adaptation Plan Task Force

December 19, 2023

6:30pm

Staff Contact:
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gtrevino@pacifica.gov

Climate Adaptation

What is Climate Change Adaptation?

According to the International Panel on Climate Change[1], climate change adaptation[2] is the deliberate process of responding to the current and anticipated impacts of climate change, encompassing both human and natural systems. This involves making adjustments to mitigate harm and capitalize on beneficial opportunities. In human systems, adaptation seeks to moderate the adverse effects of climate change on individuals and societies, employing various strategies across infrastructural, technological, institutional, behavioral, and cultural dimensions. Simultaneously, in natural systems, adaptation involves the inherent adjustments to the actual climate and its effects, with human interventions potentially facilitating these adjustments to align with expected climate conditions. Overall, climate change adaptation strives to manage risks, promote resilience, and foster sustainable coexistence with the evolving climate landscape.

Examples

Examples of Climate Change Adaptation could encompass actions across many sectors of the public sphere, such as infrastructural improvements, ecosystem conservation and restoration, climate resilient agriculture, community based adaptation, policy and governance, technological innovations, capacity building and education, and many more. The United States Environmental Protection Agency provides a robust list of possible actions that could fall under the purview of climate change adaptation strategies undertaken by governments.

Examples of infrastructure improvements include elevated buildings or water management systems. By raising the height of buildings in flood-prone areas, you are reducing the risk of damage during extreme weather events such as storm surges. Developing improved drainage systems, reservoirs, as well as water storage facilities, a community can withstand the changing precipitation patterns of the future and mitigate flooding.

Within ecosystem conservation and restoration, there are a plethora of examples to choose from. Establishing protected areas to preserve biodiversity and provide habitats will support species well-being as climatic conditions continue to change. Another example could be a riparian buffer zone, which aims to create vegetative buffers along water bodies in order to prevent erosion, filter pollutants, and enhance ecosystem resilience.

Climate resilient agriculture goes as far as acting as both an activity that directly benefits the output of agriculture in the face of an ever changing climate, as well as acting as a carbon sink. Drought resilient crops are a practice employed where the use of crop varieties ensure food

[1] United Nations Intergovernmental Panel on Climate Change. https://www.ipcc.ch/
[2] “Climate Change 2022: Impacts, Adaptation and Vulnerability”. United Nations Intergovernmental Panel on Climate Change Annex II: Glossary. 2022. https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_Annex-II.pdf

security even in the face of less rain. Precision agriculture is another example where technology is implemented to optimize resource use and improve crop yield.

Community based adaptation can look like establishing early warning systems that provide residents with timely information about impending climate related risks such as extreme storms. Additionally, establishing a program such as a community-managed natural resource system divides the responsibility and accountability of conservation to beyond just the city.

In policy and governance, climate resilient building codes can implement and enforce actions that take into account future climate risks, such as stronger construction standards in areas prone to hurricanes or earthquakes. Coupled with adjusting land use planning to integrate climate considerations, climate related hazards can be avoided.

Technological innovations such as climate-adaptive technology can improve local irrigation systems, or promote energy efficient infrastructure. Green infrastructure is a popularly rising subset of this, in which nature-based solutions such as green roofs and permeable pavements are incorporated into building design. This addresses issues such as heat islands and flooding.

Central to any meaningful action taking place is capacity building and education, that way members of the public are properly informed and involved in the process of climate change adaptation. Providing education and training to communities, governments, and organizations to enhance their capacity to understand and plan for climate change improves receptiveness to the measures needed to take place. This can happen through activities such as public awareness campaigns.

How it may apply to the City of Pacifica

Adaptation involves adjusting social, economic, and environmental practices at a systemic citywide level in order to cope with and respond effectively to climate change. It is important that Pacifica prioritize strategies to reduce vulnerabilities and enhance the ability to thrive in a changing climate.

As will be further explained in the following section, planning for adaptation and resilience go hand in hand; adaptation serves a more immediate timeline where the focus is on what tangible actions can a community take between the present and the next 5 to 10 years. This is inclusive of infrastructural developments that can better prepare a community for the changing climate impacts. Adaptation is central to all facets of a community, from government to business to the private home. Engaging in adaptation planning with a community as vested in climate change and environmental protection as Pacifica presents countless opportunities. The sooner these adaptive changes are implemented, the less of an economic burden associated with recovery efforts climate change poses to the community.

Climate Resiliency

What is Climate Change Resiliency?

The Intergovernmental Panel on Climate Change (IPCC) has defined resilience[3] as "the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a potentially hazardous event in a timely and efficient manner". So, having a basic understanding of what the term 'resilience' means is central to how it is applied in the environmental sciences. From there, it is a basic and straightforward application; ensuring that infrastructure and communities are resilient to climate related risks such as drought, flooding, extreme weather events, and eventual sea level rise.

A point that is very important to distinguish is that there is going to be an inherent amount of overlap between the two ideas. While adaptation may refer to the future preparedness of a system, it can be argued that resiliency builds on this by including the notion of preparedness *and* the ability to bounce back from external interruptions to the said system.

A final note on Climate Change Resilience; adaptation and resilience are complementary[4], and some sources even go as far as to say that adaptation is viewed as the physical measures and actions, while resilience is more of a perspective on critical thinking regarding adaptation and mitigation. Thus, resilience encompasses both adaptation and mitigation[5].

Examples

It goes without saying then, that based on the above definitions of what climate change resiliency is, that measures and actions that relate to adaptation also relate to resilience. Common examples of resilience as it pertains and is involved with Nature Based Solutions are detailed in the December Staff Report on NBS, Relation to Adaptation and Resilience, Curated Pacifica Recommendations, and Glossary document.

To summarize very shortly, resilience could be seen in many nature based solutions. Resilience involves ensuring a system can return to normal operating conditions after a disturbance of some sort; the employment and strengthening of nature based solutions allows just that. A solution such as a horizontal levee would allow a community to experience lessened impacts from storm surges that could cause flooding to communities along the coast.

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[3] "Climate Change: Defining Adaptation and Resilience, with Implications for Policy". Congressional Research Service. May 2021. https://sgp.fas.org/crs/misc/IF11827.pdf

[4] "What is the difference between climate change adaptation and resilience". Sara Mehryar. September 2022. The London School of Economics and Political Science. https://www.lse.ac.uk/granthaminstitute/explainers/what-is-the-difference-between-climate-change-adaptation-and-resilience/

[5] "Climate Change: Adaptation, Mitigation and Resilience". United States Department of Agriculture. National Institute of Food and Agriculture. https://www.nifa.usda.gov/grants/programs/climate-change-adaptation-mitigation-resilience

Climate change resilience could additionally be the construction of green infrastructure such as green roofs, urban forests, and other dedicated green spaces that work towards reducing phenomena such as the heat island effect or excess stormwater runoff. Building on this, local resilience can be enhanced by reintroducing native plant species to the flora variety. Native plant species tend to be more well suited to the local environment. In the example of Pacifica, there are many California Native species that would thrive here due to their evolved capabilities to be drought resistant, fire resistant, halophytic, and accustomed to the geologic substrate of the region.

How it may apply to the City of Pacifica

The December Staff Report on NBS, Relation to Adaptation and Resilience, Curated Pacifica Recommendations, and Glossary document will address specific recommendations. Resilience is a crucial aspect of planning for the future; almost all environmental documents currently being drafted and produced that are in regards to planning, development, and climate change address this topic. Resilience is an inseparable component of what it means to study the environmental sciences and to guide local municipalities in preparing for the inevitable impacts of climate change.

That being said, the City of Pacifica could greatly benefit from the incorporation of resilience into the focus of this draft. The sooner this aspect of preparation is considered, the more greenhouse gas emissions could potentially be avoided. Additionally, the local ecosystem that involves the anthropogenic sphere will experience other numerous long term benefits. Planning with resilience in mind will allow Pacifica to respond to and recover from the adverse effect of climate related events. Climate change is already contributing to more frequent and severe weather events, rising sea levels, shifting temperature patterns, etc.. Resilience planning will enable the community to assess vulnerabilities and prioritize actions to reduce risks and enhance adaptive capacity.

Examples of Adaptation

Adaptation Examples	
City	Adaptation Strategy / Measure
Berlin	Sponge City - Carefully designed urban area made to imitate natural water cycles - Water management is a priority via green infrastructure; parks, wetlands, rain gardens, bioswales, green roofs - Slows water flow rate, enhances ground water absorption, evapotranspiration
Los Angeles	Resilient Los Angeles Strategy - Climate Risk and Vulnerability Assessment - Implement urban heat island reduction plans - Increase access to green space and open space - Increase Equitable tree canopy coverage - Investment in green infrastructure, stormwater retention, water reuse, and reducing flood risk - Modernize power grid to expand renewable energy source access
Norfolk, Virginia	Vision 2100 - Green infrastructure - Elevating buildings - Enhancing coastal defenses to protect against sea level rise
San Diego	Climate Action Implementation Plan - Restore wetlands, marshes, and other riparian habitats by a certain date to increase carbon sequestration - Create a Street Tree Master Plan with the target of planting 100,000 trees by set date, and identify ways to increase permeable areas. Goal: 35% urban tree canopy cover - Reduce dependence on imported

	water, restore watershed with permeable areas, waterways restoration projects, rainwater harvesting rebates, and grass replacement rebate - Install cool pavement material on city parking lots to increase building energy efficiency and reduce urban heat island effect
San Francisco	2021 Climate Action Plan - Clean grid goal for 100% renewable energy and eliminate natural gas infrastructure - Improving public transportation infrastructure - Usage of nature based solutions to sequester carbon via green infrastructure, enhancing biodiversity, and protecting green spaces

V. Discussion and Action

Item 1b: Nature Based Solutions Introductory Staff Report

Definition and Examples

Connection to Adaptation and Resilience

Solutions Potentially Relevant to Pacifica

Glossary

City of Pacifica

Climate Action and Adaptation Plan Task Force

December 19, 2023

6:30pm

Staff Contact:
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NBS

Definition

According to the International Union for Conservation of Nature,[1] Nature-Based Solutions (NBS) involve measures aimed at effectively and adaptively safeguarding, sustainably overseeing, and revitalizing natural and altered ecosystems. These actions simultaneously contribute to addressing societal challenges while providing benefits to both human populations and the environment. These solutions tackle various societal challenges by ensuring the safeguarding, sustainable management, and rejuvenation of both natural and modified ecosystems. This approach yields advantages for biodiversity and human well-being alike, relying on the positive outcomes derived from maintaining robust ecosystems. NBS play a crucial role in confronting significant issues such as climate change, disaster risk reduction, food and water security, biodiversity depletion, and human health, thereby playing a pivotal role in fostering sustainable economic development.

Common Examples

Aligning with this definition, many governmental organizations provide guidance on how to advance with framing nature based solutions that are feasible. One such agency is the United States Department of the Interior[2]. They provide resources[3] detailing how a community might be able to utilize NBS to their advantage.

NBS can be categorized to help focus certain action measures. For instance, if a community is aiming to address greenhouse gas emissions there are many actions that can be taken. Conserving and even restoring coastal habitats, forests, wetlands, and grasslands all remove carbon dioxide from the atmosphere and stores it, acting as a sink. Improved agricultural management, including cover crops, no-till, rotational grazing, and sustainable timber management reduces erosion, and allows for soils to store carbon.

For addressing urban heat island effect or air pollution, green roofs help insulate buildings from high temperatures and cool them through methods such as evapotranspiration. This in turn reduces the need for cooling, those associated costs, and lowers emissions. Urban trees and forests additionally aid to capture air pollutants while intaking carbon.

NBS additionally address issues such as inland flooding and non-point source pollution, through actions such as protecting and restoring riparian buffers. This action slows water, stabilizes banks, and can reduce pollution. Floodplain reconnection and restoration measures specifically

[1] International Union for Conservation of Nature https://iucn.org/our-work/nature-based-solutions
[2] United States Department of Interior, Office of Policy Analysis, Integrative Work. November 2022 https://www.doi.gov/ppa/integrative/nature-based-solutions
[3] “Opportunities to Accelerate Nature-Based Solutions: A Roadmap for Climate Progress, Thriving Nature, Equity, & Prosperity”. White House Council on Environmental Quality, White House Office of Domestic Climate Policy, White House Office of Science and Technology. November 2022. https://www.doi.gov/ppa/integrative/nature-based-solutions

target the lowering of river height and speed during a flood, so that erosion, sedimentation, and pollution from excess nutrients are avoided or mitigated.

Stormwater and urban flooding is an issue that seems to have many proposed and practiced solutions based in nature. While green roofs absorb and transpire some water, including stormwater runoff, there are a plethora of other solutions. Rain gardens are shallow basins of sorts in yards and along streets that assist in absorbing storm water runoff. Additionally, these pair well with bioswales. Bioswales are channels of plants (preferably native species) along roads that intake runoff. Building on the idea of urban trees and forests that conduct these same principles, constructed wetlands can capture runoff as well.

Addressing shoreline erosion is a difficult task as there are so many factors that impact the viability of a certain nature based strategy. Worldwide, the restoration of and protection of mangroves, coral reefs, beeches, rock reefs, coastal dunes, freshwater marshes, and saltwater marshes all reduce impacts noticed from inevitable coastal erosion. More popularly as of recently are the introduction of living shorelines and horizontal levees. These can typically be made up of native species to form a habitat barrier along the shoreline.

Wildfires, especially in California, can be devastating. It is imperative that NBS are included in the management of wildfire risk. Forest management, and prescribed burns, reduce this risk. Greenbelts are additionally a solution to pair with forest management. Greenbelts function as a forest near communities that are managed to be less flammable, and can be irrigated, so as to act as a firebreak.

To address drought, clearing of invasive plants can contribute to the effort to save water. Native species are naturally accustomed to consuming and operating with less available water content, especially here in California.

NBS and Climate Mitigation, Resiliency, and Adaptation

What is the connection?

NBS play a crucial role in mitigating the impacts of climate change by leveraging the natural environment to sequester carbon, enhance resilience, and contribute to overall climate adaptation. Forests, wetlands, and other ecosystems all act as carbon sinks that remove carbon dioxide from the atmosphere. The most well known example of this, which also happens to be a solution proposed by members of the public during previous Task Force and City Council meetings, is to simply plant more trees. Trees sequester carbon through photosynthesis and mitigate the greenhouse effect.

Throughout Pacifica there is great potential for not only open spaces to be revamped, but for the creation of urban forests as well. Afforestation and reforestation contribute to sequestration and mitigating the effects of climate change via the greenhouse effect. Afforestation and reforestation are simple, effective ways to store carbon in the biomass and soils of local forests.

As described in the common examples above, wetland protection and restoration not only acts as a means for carbon sequestration, but also as a protective barrier against flooding and extreme weather events. The important takeaway is this; when discussing how nature-based solutions can mitigate the effects of climate change via carbon sequestration, resilience and adaptation are also being addressed.

While manmade and engineered solutions go a long way in mitigating the effects of climate change, it is nature that is central to resilience and adaptation. Climate change resilience and climate change adaptation are related concepts. The focuses and implications of each differ and are distinct in a couple of ways.

Resilience refers to the capacity of a system[4]; to absorb changes and recover from those disturbances. Thus, the focus is more broad than that of adaptation. NBS are typically considered for the long term mitigation of a noticeable impact from climate change. This requires sustained, ongoing effort to address challenges, as opposed to a short term coping strategy. Climate change adaptation refers more so to the adjustments made within both the natural and human systems in response to the actual felt impacts of climate change, as well as the upcoming ones. Thus, the focus is narrower. For example, a specific adaptation related solution would look like restoring a coastal dune that would act as a sea wall. A NBS focused on resilience would add on to this by incorporating the introduction of native plant species to additionally act as a buffer against extreme storms, on top of whatever benefit is already gained by the restoration of the physical coastal dune itself. So, the timeframe of adaptation related solutions tend to be dynamic in the sense that they aim to address immediate risks, while allowing for the incorporation of longer term strategies being added on.

In summation, they go hand in hand[5]. When brainstorming how NBS can positively bolster the defensive capabilities of a community, it is important to realize that mitigation is achieved through the combination of resilience and adaptation. NBS inherently tend to be catered towards long term time frames; however, this does not exclude the possibility of an immediate adaptation related action.

[4] "Climate Change: Defining Adaptation and Resilience, with Implications for Policy". Congressional Research Service. May 2021. https://sgp.fas.org/crs/misc/IF11827.pdf

[5] "What is the difference between climate change adaptation and resilience". Sara Mehryar. September 2022. The London School of Economics and Political Science. https://www.lse.ac.uk/granthaminstitute/explainers/what-is-the-difference-between-climate-change-adaptation-and-resilience/

Curated Example List for Pacifca

From the common examples, which could be most effective in Pacifica?

To reiterate what was communicated in previous Task Force meetings, the drafting of this CAAP should steer clear of anything already addressed in other plans already published by the City of Pacifica. That is not to say that the objectives of this CAAP are unable to support the actions taken and already outlined in another document.

That being said, Pacifica faces climate change related issues on multiple fronts; it is a low-lying coastline city, where any changes to weather patterns can easily be noticed. Within the goal to reduce greenhouse gas emissions comes the responsibility of mitigating the effects of said climate change.

Of the examples quickly outlined above, there are a few standouts that will be expanded upon here. To begin, greening the city via the expansion of urban forestry and green roofs presents untapped potential within Pacifica. During the public comment period of the October 2023 meeting, it was brought to the attention of the Task Force that the community would like for the tree canopy coverage to increase citywide. In alignment with this community goal, the Task Force agreed to implement NBS into the CAAP. Increasing the amount of trees and urban forestry around the city will achieve this.

Trees and other vegetation provide invaluable ecosystem services. Ecosystem services are direct, or indirect, contributions from ecosystems to the wellbeing of the anthropogenic sphere. Besides providing habitat, aesthetic resources, and contributing to cleaner air, trees can sequester thousands of pounds of carbon dioxide[6]. For instance, in the lifetime of a typical California native Willow tree, around 1,200 pounds of carbon can be sequestered. A singular California native Monterey Pine can sequester anywhere from 1,500 to 4,000 pounds of carbon in its life cycle. A California native Monterey Cypress tree can sequester 3,900 pounds of carbon.

This alone is a promising opportunity, as there could be space for potentially hundreds of new trees to be planted throughout the City of Pacifica. The second half of the effort towards greening the city would be green roofing. Green roofing can reduce the total flow of stormwater by up to 65%[7], while also delaying the flow rate anywhere up to 3 hours. They can additionally reduce building energy usage, provide shade, thermal mass, and insulation. Besides creating urban habitat for plants and animals, they can work towards reducing the heat island effect.

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[6] “How Much Carbon Does a Tree Capture”. Georgette Kilgore. November 2023. 8BillionTrees. https://8billiontrees.com/carbon-offsets-credits/carbon-ecological-footprint-calculators/how-much-carbon-does-a-tree-capture/

[7] Federal High-Performance Green Buildings: Green Roofs. United States General Services Administration. 2021. https://www.gsa.gov/governmentwide-initiatives/federal-highperformance-green-buildings/resource-library/integrative-strategies/green-roofs

According to the United States General Services Administration, green roofs are expected to additionally last twice as long as conventional roofs on top of the aesthetic value they contribute.

The United States General Services Administration also reports that green roofs on both commercial and public buildings can provide a payback. This information is based on the 50 year average annual savings. They present an internal rate of return of 5.2% and ROI of 224% based on a value of $2.7/square foot. This is due to the lower energy costs, less of a need for roof replacement as frequently, and reduced costs accumulated from stormwater related issues.

Another easily implementable solution in the form of bioswales[8] can present a multitude of benefits. Bioswales serve as a mechanism for the filtration and infiltration of stormwater along roads, parking lots, sidewalks, and most other paved surfaces throughout cities. Bioswales contribute significantly to the local recharge of ground water, cycling of nutrients, and can reduce the impacts felt by major storms. The EPA additionally suggests[9] pairing a solution such as this with rain gardens. Rain gardens are designated landscapes that collect rainwater from roofs or streets in the event of storms, with grasses and native species present. This provides additional habitat, a means for groundwater recharge, and a cost effective way to manage runoff and filter pollutants.

Lastly in regards to making cities greener, one of the most effective NBS resides in conservation and ecosystem restoration. California is a truly fortunate state in the way that our native flora demonstrate exemplary characteristics regarding drought resistance, salt tolerance, and the ability to be well-suited for coastal landscaping. Below is a curated list of California native species that could not only survive in conservation and ecosystem restoration efforts, but would thrive in the very specific micro-climate region of Pacifica. This information can be found via the directory of California native plant species on Jepson Eflora[10].

Species, Common Name	Adaptations, Coastal Suitability
Eriogonum spp., California Buckwheat	Adaptations: Drought tolerant, attracts pollinators, provides erosion control Coastal Suitability: Well suited for coastal bluffs and slopes
Fragaria chiloensis, Beach Strawberry	Adaptations: Drought resistant ground cover with edible berries Coastal Suitability: Thrives in sandy soils along the coast
Artemisia californica, California Sagebrush	Adaptations: Drought resistant, aromatic foliage, and supports local wildlife

[8] Bioswales. State University of New York College of Environmental Science and Forestry. https://www.esf.edu/ere/endreny/GICalculator/BioswaleIntro.html#:~:text=What%20is%20a%20Bioswale%3F,%22%20or%20%22filter%20strips.%22

[9] "Soak Up the Rain: Rain Gardens". United States Environmental Protection Agency. November 2023. https://www.epa.gov/soakuptherain/soak-rain-rain-gardens

[10] Jepson Flora Project, Jepson eFlora. The Jepson Herbarium. University of California Berkeley. https://ucjeps.berkeley.edu/eflora/

	Coastal Suitability: Common in coastal scrub habitats, thrives in well-drained soils
Eriogonum latifolium, Coastal Buckwheat	Adaptation: Drought resistant, low growing, and suitable for coastal gardens Coastal Suitability: Flourishes in sandy soils and coastal bluffs
Distichlis spicata, Saltgrass	Adaptations: Salt tolerant, commonly found in coastal marshes and estuaries Coastal Suitability: Ideal for planting in areas with periodic saltwater exposure
Camissoniopsis cheiranthifolia, Beach Evening Primrose	Adaptations: Drought tolerant, low growing, produces showy flowers Coastal Suitability: Well adapted to sandy coastal soils
Limonium spp., Sea Lavender	Adaptations: Salt tolerant, vibrant flower clusters Coastal Suitability: Thrives in coastal salt marshes and dunes
Tanacetum camphoratum, Dune Tansy	Adaptations: Drought resistant, aromatic foliage Coastal Suitability: Common in coastal dune ecosystems
Eschscholzia californica, California Poppy	Adaptations: Drought tolerant, iconic golden flowers Coastal Suitability: Flourishes in well drained coastal soils
Arctostaphylos pacifica, Pacific Manzanita	Adaptations: Drought resistant, compact shrub with attractive bark Coastal Suitability: Suitable for coastal gardens and dune landscapes
Quercus agrifolia, Coast Live Oak	Adaptations: Drought resistant, evergreen oak with significant ecological value Coastal Suitability: Well suited for coastal forests and managed lands
Juglans californica, California Black Walnut	Adaptations: Drought resistant, deciduous tree providing habitat and food for wildlife Coastal Suitability: Suitable for riparian habitats and coastal woodlands
Cercis occidentalis, Western Redbud	Adaptations: Drought tolerant, deciduous shrub with showy spring flowers Coastal Suitability: Thrives in well drained soils and coastal forest edges
Corlyus cornuta var. Californica, California Hazel	Adaptations: Drought resistant, deciduous shrub supporting local fauna Coastal Suitability: Well adapted to coastal woodland habitats
Morella californica, Pacific Wax Myrtle	Adaptations: Drought tolerant evergreen shrub with aromatic foliage

	Coastal Suitability: Common in coastal scrub and woodland habitats
Iris douglasiana, Iris Douglas	Adaptations: Drought tolerant, perennial iris with attractive flowers Coastal Suitability: Flourishes in coastal meadows and forest understories
Symphoricarpos albus, Snowberry	Adaptations: Drought resistant, deciduous bruh providing habitat and erosion control Coastal Suitability: Thrives in coastal scrub and woodland environments
Isocoma menziesii, Coastal Goldenbrush	Adaptations: Drought tolerant, evergreen shrub with bright yellow flowers Coastal Suitability: Well adapted to coastal bloods and scrub habitats
Physocarpus capitatus, Pacific Ninebark	Adaptations: Drought resistant deciduous bruh with peeling bark Coastal Suitability: Suitable for riparian zones and coastal woodlands
Rubus ursinus, California Blackberry	Adaptations: Drought resistant deciduous shrub with edible berries Coastal Suitability: Common in coastal scrub and woodland areas

To reiterate, the list provided above are recommendations generated on the information known regarding the parameters of this project, while also taking into account the local microclimates and historical data regarding the ecosystems present in Pacifica. When it comes to planting California native species that are listed as endangered or threatened, there are specific regulations and considerations that must be taken into account. The California Native Plant Protection Act (CNPPA) and the California Endangered Species Act (CESA) are two key pieces of legislation governing the protection and management of native plants.

So, when consulting with a local horticulturist or arborist, and when deciding on if it is appropriate to plant natives in a listed family such as a Manzanita, there are special considerations. Obtaining necessary permits is a crucial aspect, as well as determining the need for and even possibly conducting an Environmental Impact Assessment, consulting local habitat restoration plans, and consulting experts.

The next NBS that presents potential benefits for the City of Pacifica are living shorelines, which can also be referred to as a horizontal levee system[11]. This is a coastal protection and restoration strategy that involves the creation of a gently sloping, vegetated embankment or berm along the shoreline. This NBS aims to enhance resilience to coastal hazards such as storm surges, erosion, and sea level rise, while also providing ecological benefits. California native species are often utilized in the establishment of horizontal levees due to their

[11] "Horizontal Levees". Natural Resilient Communities. https://nrcsolutions.org/horizontal-levees/#:~:text=By%20including%20natural%20habitats%20on,energy%20and%20slow%20down%20floodwaters.

adaptability to local conditions. Additionally, incorporating a dune ecosystem can complement the protective functions of a horizontal levee, especially in buffering against storms and rising sea levels.

The incorporation of a NBS that improves aesthetics and provides ecosystem services provides an opportunity for Pacifica to mitigate the impacts of climate change on multiple fronts. Living shorelines act as a carbon sink, and according to the National Oceanic and Atmospheric Administration,[12] living shorelines perform better than hardened shoreline measures during major storms.

While horizontal levees include a hardened structure to some degree, they are set substantially further back from the coastline as compared to traditional levees. They consist of a hardened shoreline protection feature, with natural habitat protecting. This natural habitat can consist of naturally occurring ecosystems such as beach dunes, mangroves, marshes, and more. These systems all have inherent buffering capabilities to reduce the impacts of coastal flooding and storms. As a result of this natural mitigation, the hardened levee structure can be smaller than if there were no vegetation protecting it. This lowers project costs that are associated with the construction of the hardened levee structure.

For context, there are some key components and benefits of horizontal levees. In terms of vegetation, the levee can be planted with a mix of native species. This is inclusive of grasses, shrubs, and trees adapted to coastal conditions. These plants assist with stabilizing the levee, enhance its ability to absorb wave energy, and contribute to overall ecosystem health. In regards to wave attenuation, the slope of the levee theoretically will dissipate the wave energy. Living shoreline horizontal levee systems are designed to adapt to sea level rise by gradually building on elevation through sediment deposition and vegetation growth; this is essential for the long term resilience of the coast line.

There are hazard mitigation benefits associated with the implementation of horizontal levee living shoreline features. When done properly, the horizontal levee system can reduce coastal erosion, which may be an issue that Pacifica is looking to address. Erosion can contribute to the reduced ability of soil to store water, nutrients, and maintain its natural structure. This has implications that should be considered for the anthropogenic sphere of concern. Erosion often additionally leads to the exposure of subsoil, higher rates of runoff, loss of biodiversity, and can potentially deposit in a lower lying area that can be hazardous.

Dune adapted plants, such as beach grasses and species able to withstand certain saltwater concentrations could be viable candidates. *Abronia* Sand Verbena is a well suited dune adapted species. Sand Verbena is seen in many dune systems up and down the coast of California that provides the ecosystem service of binding sand. Below is a table highlighting some of the possible species to be used in a dune related project for a living shoreline.

[12] “Understanding Living Shorelines”. National Oceanic and Atmospheric Administration. https://www.fisheries.noaa.gov/insight/understanding-living-shorelines#:~:text=Their%20services%20to%20the%20environment,better%20than%20a%20hardened%20shoreline.

Species	Adaptation
Abronia spp., Sand Verbena	Adaptations: Dune adapted flowering plants that help bind sand, preventing erosion
Camissoniopsis cheiranthifolia, Beach Evening Primrose	Adaptations: Low growing perennial with large showy flowers. Important for stabilizing dunes
Eriogonum parvifolium, Dune Buckwheat	Adaptations: Drought tolerant, compact shrub with silvery foliage, suitable for stabilizing sandy soils
Erigeron glaucus, Seaside Daisy	Adaptations: Dune adapted perennial with lavender colored flowers, contributing to dune stabilization
Abronia latifolia, Yellow Sand Verbena	Adaptations: Dune adapted species with yellow flowers, stabilizes dune environments
Croton californicus, California Croton	Adaptations: Drought tolerant shrub with fleshy leaves, contributes to dune stabilization
Tanacetum camphoratum, Dune Tansy	Adaptations: Drought resistant shrub with aromatic foliage, suitable for sandy dune environments
Fragaria chiloensis, Beach Strawberry	Adaptations: Low growing groundcover with edible berries, contributes to dune stabilization

Most of these plants, by adaptation, have become halophytic to some degree. This means they can survive in environments where there is salt spray along the coast, meaning they are salt tolerant. These plants are adapted to the challenges posed by saltwater exposure, sandy soils, and other coastal conditions.

The final major NBS that could be applicable to the City of Pacifica would be management of fuels to reduce wildfire risk on managed lands. Wildfires are frequent and common in California as a result of ongoing droughts, and changes in climate patterns. Luckily, California has many indigenous plant species that are drought resistant or fire resistant.

NBS for mitigating wildfires involve utilizing natural processes, ecosystems, and vegetation management to reduce the overall risk to the community, the intensity of wildfires, and the lasting impact. Due to climate change altering and increasing the severity of wildfires, it is important Pacifica is able to prepare for this risk. The below outlined strategies revolve around enhancing local ecosystem resilience, restoring natural fire regimes, and incorporating sustainable practices. These practices are imperative to Pacifica's goal of creating a carbon sink via its managed lands.

Through fuel reduction and management,[13] Pacifica can reduce the accumulation of flammable vegetation. This can be conducted via controlled/prescribed burns, selective thinning, and creating defensible space around homes. California native species even have a large role to contribute in this process. There are many California fire resistant or fire adapted species, such as California sagebrush, Ceanothus, and Manzanita.

Creation of greenbelts and defensible space[14] around communities involves establishing areas where vegetation is managed. This vegetation should be strategically managed to reduce fire risk via physical space, establishing benchmarks for how far certain species should be from a structure, and how frequently certain species should be thinning out or reduced in order to prevent accumulation of fuels.

Tied into this idea and practice would be the restoration of fire adapted ecosystems around Pacifica. As previously mentioned, California is home to species that are fire resistant and fire adapted. Reintroducing these species into spaces around Pacifica, then controlling small prescribed burns could mimic historical fire patterns. Doing so can prevent larger catastrophic fires from happening. Many chaparral and grassland species are subject to this sort of practice across the state.

Additionally embedded within this idea is the adoption of drought tolerant landscaping throughout areas of concern in Pacifica. The species outlined in both tables above are all excellent examples of species that are native, have regional relevance, will be important to establishing local resilience, and can act as carbon sinks, all while being drought tolerant.

NBS Background Information

Listed below is a glossary of the typical terminology used, ideas, systems, or processes related to NBS. The list was provided by Vice Chair Kai Martin. Sources are linked within the definition or explanation of each; if a term does not have a link it is instead the information provided by the Vice Chair via email communication.

Adaptive Management

According to the Department of the Interior Adaptive Management Technical Guide, “adaptive management is]the] systematic approach for improving resource management by learning from management outcomes”.

[13] “Fuels Reduction” CalFire. https://www.fire.ca.gov/what-we-do/natural-resource-management/fuels-reduction
[14] “Prepare For Wildfire: Defensible Space” CalFire. https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-space/#:~:text=Remove%20or%20prune%20flammable%20plants,piles%2C%20swing%20sets%2C%20etc.

In the context of Pacifica, this could be applied towards both nature based solutions and the more immediate solutions framed from adaptation principles. It is general best practice in the environmental sciences that adaptive management is necessary to fully achieve the potential best outcome for a system. In this instance the system would be the City of Pacifica. The goal in mind is to mitigate the adverse effects of climate change. This is made possible not by a generic and prescriptive approach, but rather an iterative study of what is effective, and what is not.

Beneficial Reuse

The United States Environmental Protection Agency defines beneficial reuse as a process; specifically a process in which facilities reuse byproducts or waste materials in their own operations as opposed to sending them to landfills.

Bioactivated Media

A material used that uses bacteria and other biologically active molecules to break down pollutants in water, typically nitrogen and phosphorus.

Biophilic Design

A design scheme in which human adaptations to the natural world are emphasized, connecting nature with the modern built environment.

Carbon Negative

To emit less than zero carbon dioxide into the atmosphere, as well as carbon dioxide equivalent greenhouse gasses. Thus, this essentially means offsetting more carbon dioxide than you produce via carbon capture or sequestration.

Carbon Neutral

A net release of no carbon dioxide into the atmosphere, typically through offsetting emissions via carbon capture and sequestration solutions. Removing the equivalent amount of carbon via activity supply chains and creating carbon sinks.

Carbon Sink

Natural environment or ecosystem that can absorb carbon dioxide from the atmosphere; typically absorbing more carbon from the atmosphere than what is released by this system.

Carbon Source

The opposite of a carbon sink; any activity or system that releases more carbon into the atmosphere than it absorbs.

Combined Sewer Overflow

Combined Sewer Overflows are when systems collect rainwater runoff, domestic sewage and industrial wastewater. When the amount of runoff exceeds the capacity of the system, the flow can go into nearby bodies of water.

Ecological Corridors

Corridors are typically narrow strips of lands that serve as a small section mirroring the larger ecosystem of that region, so that species may freely travel from one area to another in developed and urban areas.

Ecosystem Services

Ecosystem services are both the direct and indirect benefits ecosystems provide for humans; this can range from providing habitat and resources to larger scale activities such as sequestering carbon and providing cleaner air quality.

Edge Composition

The combination of natural edges, nature-based features, and engineered structures that make up the edge of a site or resilience strategy.

Edge Resiliency Strategies

Restoration and reinforcement measures used to promote, protect, and stabilize terrestrial and aquatic landscapes from the forces of erosion, drainage, and climate change.

Embodied Carbon

Embodied carbon is a description for the carbon emissions released in the production lifecycle process of building supplies; this is a holistic examination of carbon emissions, inclusive of material extraction, manufacturing, transport at each stage, the physical construction of a building, and the disposal of parts.

Environmental Justice

The Environmental Protection Agency states that environmental justice is “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

Ephemeral Stream

The Environmental Protection Agency states that an ephemeral stream is one that typically has water only during a precipitation event, and can last for a short duration afterwards.

Evapotranspiration

Evapotranspiration is described as the process in which water is transferred from the land to the atmosphere. This can happen through a couple of processes, such as evaporation from the soil or surface water, as well as transpiration from plant species.

Floodable Area

The outdoor area of a site that is designed to withstand flooding with minimal damage, often providing increased flood storage capacity for riverine environments.

Green Infrastructure

Design practices that use or mimic natural systems to manage stormwater runoff or reduce hazards.

Greenway

Relatively clean domestic wastewater, generated in households or office buildings, from sinks, baths, washing machines, and other appliances.

Greywater

Domestically, commercially, and industrially used water that typically comes from sources such as untreated water from machines, sinks, bathrooms, and other processes.

Habitat and Habitat Buffers

The physical location in which a population of plants or animals live; buffers are the protected zones that are established around sensitive areas to mitigate the impacts from human activity.

Habitat Fragmentation

Fragmentation that involves alteration of habitat resulting in spatial separation of habitat units from a previous state of greater continuity.

Habitat Patch

An area of distinct habitat type. In landscape ecology, patches are spatial units at the landscape scale and often surrounded by a non-similar landscape type but may be connected to other patches by landscape corridors.

High-Albedo Pavement

The ability of materials to reflect the visible, infrared, and ultraviolet wavelengths of sunlight. Increased surface reflectance of pavement materials may be the most straightforward heat island reduction strategy, reducing absorption and reradiation of solar heat.

Hydrological Analysis

Analysis that quantifies the flow rate of water in a watershed or drainage area over time.

Impervious Cover

Surfaces that cannot effectively infiltrate rainfall such as rooftops, pavement, sidewalks, and driveways.

Infiltration

The process by which water flows above ground into the subsurface, soaking into subsurface soils and moving into substrates.

Lacustrine

Relating to or associated with lake ecosystems or flooding.

Life Cycle Carbon

The evaluated carbon or greenhouse gas emission total of a product or site, from creation to operation to destruction.

Light Pollution

An unwanted consequence of outdoor lighting that includes such effects as skyglow, light trespass, and glare.

Native Plant

Indigenous terrestrial and aquatic plant species that have evolved and occur naturally in a particular region, ecosystem, and habitat.

Nature Based Features

Engineered components of a project that are designed to mimic characteristics or performance of natural features for coastal risk reduction, habitat and ecosystem complexity, or other benefits. These often include real natural processes or plants but have an engineered or human-made component. Nature based features mimic characteristics of natural features, but are created by human design, engineering, and construction to provide specific services for natural systems.

Palustrine

Relating to a system of inland, nontidal wetlands characterized by the presence of trees, shrubs, and emergent vegetation.

Pollutants of Concern

Pollutants in stormwater designated by relevant regulatory agencies that can have potentially significant negative impacts on water quality in a given region.

Riverine

Relating to river ecosystems.

Sedimentation and Sediment Transport

Process of settling or depositing rock fragments, soi, organic matter, or dissolved material that has been eroded or transported by water, wind, ice, or gravity.

Stormwater Reuse

The harvesting, cleaning, and reuse of surface water runoff from roofs, landscapes, and other hard surfaces in urban environments for secondary purposes such as landscape irrigation. Typically, runoff from a road or parking lot is not resided due to pollutant loads.

Wetland

Lands transitioning between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have one or more of the following three attributes: at least periodically, the land supports predominantly hydrophytic vegetation; the substrate is predominantly undrained hydric soil; and the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

V. Discussion and Action

Item 2: Strategies and Actions Subcommittee Report

Detailed Roadmap Resource

City of Pacifica

Climate Action and Adaptation Plan Task Force

December 19, 2023

6:30pm

Chair Contact:

Kai Martin

kmartin@ci.pacifica.ca.us

	TF Approval Required: No
Water Inventory 2022 or 2023	**Detail:** The City will prepare an inventory of water usage in Pacifica for 2022 & 2023 **Deliverable:** Completed inventory and requisite information for CAAP **TF Approval Required:** No
Communicate accomplishments	**Detail:** COS will inform the CAAP TF of their progress in engaging the public in TF goals **Deliverable**: COS will prepare a report to the CAAP TF on their progress in engaging the Community in the process of preparing the CAAP **TF Approval Required**: Yes?
Community Update	**Detail:** The COS will plan the first of regular community updates on the progress of the CAAP TF **Deliverable:** A periodic report to the community on the progress of the CAAP TF in writing the CAAP & how they are addressing the community concerns. **TF Approval Required:** Yes
Draft Survey/Workshop	**Detail:** The COS will prepare a 2nd draft survey and/or workshop to be arranged to give the public another opportunity provide input (comments, ideas, concerns) to the CAAP and for the CAAP to inform the public CAAP issues **Deliverable**: A plan to conduct a survey and/or workshop to engage the community **TF Approval Required:** Yes
Begin actioning identified needs	**Detail:** The SAS will start implementation of the identified actions **Deliverable:** **TF Approval Required:**
RICAPS/SMC Office of Sustainability Sanity Check	**Detail:** The CAAP TF will coordinate w/ the RICAPS/SMC to get their evaluation of the TF progress at various points along the way toward completion. **Deliverable:** **TF Approval Required:**
Establish Subcommittees as needed	Self-explanatory
Climate Adaptation definition	Self-explanatory

Feb 2024

Community Survey/workshop	**Detail:** The COS will finalize & send out a 2nd community survey and/or conduct a community workshop to obtain their input & buy in to the CAAP TF progress. **Deliverable:** A report on the results of the community survey or workshop **TF Approval Required:** Yes

2 Research

Research - Visioning and Alternatives

Mar 2024

Initiate research on climatic changes	**Detail:** **Deliverable:** **TF Approval Required:**
Refine impacts and consider service areas for each	**Detail:** **Deliverable:** **TF Approval Required:**
Vulnerability Assessment (study of sensitivity and adaptive capacity)	**Detail:** **Deliverable:**

	TF Approval Required:
Risk Assessment (consequence and likelihood of impacts) and prioritization	**Detail:** **Deliverable:** **TF Approval Required:**
Nature Based Solutions	**Detail:** **Deliverable:** **TF Approval Required:**
Establish Subcommittees as needed	**Detail:** **Deliverable:** **TF Approval Required:**
Assign RICAPS CAAP Completion to Subcommittees	**Detail:** **Deliverable:** **TF Approval Required:**

May 2024

Community Update	**Detail:** The CAAP TF will prepare an 2nd update to the community on the progress & current actions in preparing the CAAP. **Deliverable:** A Report to the Community on the current progress of the CAAP **TF Approval Required:** Yes
Draft Survey/Workshop	**Detail:** The COS will prepare a 3rd draft survey and/or workshop to be arranged to give the public another opportunity provide input (comments, ideas, concerns) to the CAAP process and learn about the TF progress toward the CAAP completion. **Deliverable**: A plan to conduct a survey and/or workshop to engage the community **TF Approval Required:** Yes
RICAPS/SMC Office of Sustainability Sanity Check	**Detail:** **Deliverable:** **TF Approval Required:**

June 2024

Community Survey/Workshop	**Detail:** The COS will finalize & send out a 3rd community survey and/or conduct a community workshop to obtain their input & buy in to the CAAP TF progress. **Deliverable:** A report on the results of the community survey or workshop **TF Approval Required:** Yes**:**

3 Plan

July 2024

Establish adaptation vision and objectives	**Detail:** **Deliverable:** **TF Approval Required:**
Set goals	**Detail:** **Deliverable:** **TF Approval Required:**
Identify Options and actions	**Detail:** **Deliverable:**

V. Discussion and Action

Item 4: Community Outreach and Engagement Subcommittee Report

Draft Survey Questions

Stakeholder Identification

City of Pacifica

Climate Action and Adaptation Plan Task Force

December 19, 2023

6:30pm

Chair Contact:

Kimberly Finale

kfinale@ci.pacifica.ca.us

12/19/2023 *Communication Outreach and Engagement Sub-committee (COS) Report*

- Identified Community Issues and drafted preliminary survey
- Identified Stakeholders
-

20 minutes on the CAAP Task Force 12/19/2023 Agenda for brainstorming and feedback.

DRAFT survey questions:

If you live in the City of Pacifica, we want to hear from you about Pacifca's climate future!

1. Are you a Pacifica resident & what neighborhood do you live in?
2. Are you concerned about climate change?
    a. Yes
    b. No
3. Which climate issue(s) are you most concerned about? (Select up to 3?)
    a. Natural Gas and Electricity Use
    b. Transportation - cars (reduce congestion)
    c. Transportation - public transit & alternate forms of transportation (bikes, pedestrians)
    d. Air Travel
    e. Solid Waste
    f. Off-road equipment
    g. Single use plastics
    h. Water use
    i. Land use
    j. Sea level rise
    k. Other: _____
4. Have you heard of the City of Pacifica Climate Action Plan (CAP) published in 2014?
    a. Yes
    b. No
5. What is preventing you from doing more as related to climate change?
    a. Money
    b. Time
    c. Convenience
6. Are you willing to change your habits to benefit Pacifica's climate?
7. What is the likelihood you would do any of the following in the next 5 years?
    a. Buy an e-bike or scooter
    b. Buy an electric car

c. Start composing.
d. Switch to induction stove
e. Switch to a heat pump
f. Get solar panels
g. Convert lawn to native plants

Identified Stakeholders

Every Pacifica resident is a stakeholder & partner entities.
Discuss - What's missing? Next Steps?

ENTITY	Contact Info
All Principals of PSD schools and programs	
Boys & Girls Club	
Canvassing - Manor Plaza, North Pacifica, Pier	
Canvassing - Southern Pacifica	
Canvassing - Vallemar & Rockaway Areas	
Chamber of Commerce	Lynn Gallo - board president
City Departments	
Coastside Conservatives	Frank Vella frank@starboardcre.com
Coastside Masonic Lodge	coastsideweb1@gmail.com
Coastside Pride	
Fairmont Subdivisions Improvement Association	Kathy Johnson office@fairmontassociation.com
Fog Fest Committee	kjohnson@fogfest.org
Good Shepard Church	
HIP Housing	Laura Fanucchi <lfanucchi@hiphousing.org>
Homeowners Associations	
Influential Community Members (any come to mind?)	
Jefferson Union High School District	
JUHSD Superintendent	
Lions Club	Start with Sue Beckmeyer? Or PacificaLions@gmail.com
Loyal Order of the Moose/Women of the Moose	Start with Paul Lavorini? Or lodge1944@mooseunits.org

Commented [1]: To: kjohnson@fogfest.org from Rick
I'm now a member of the Pacifica Climate Action and Adaptation Task Force on the "Community Communication and Outreach" sub-committee for the City of Pacifica. I'm reaching out to find a contact on the Fog Fest team for 2024 for some early ideas, discussion on CAAP Task Force support and collaboration on the possibility of reducing our Pacifica carbon footprint. Things like reducing waste, possibly using battery instead of gas generators.

From kjohnson@fogfest.org: Thank you for your email and reaching out to us. The Fog Fest Organizing Group is still finalizing the 2023 Fog Fest. It is best if you contact us again mid March / April to have this discussion...

Kathy Johnson
Event Coordinator
Pacific Coast Fog Fest
Hot line 650-355-8200

Pacific Beach Coalition	Lynn Adams <lynn4promos@aol.com>
Pacifica 4H	
Pacifica Age Friendly Community Coalition	Roy Earnest, Chairperson KAHUNAKUPUNA@COMCAST.NET
Pacifica American Little League	
Pacifica Boys & Girls Club	
Pacifica Chamber of Commerce	
Pacifica Climate Committee	pacificaclimate@gmail.com
Pacifica Collaborative	Mary Bier
Pacifica Education Foundation	
Pacifica Gardens	
Pacifica Historical Society	President Judy Heldberg; judyece@aol.com or info@pacificahistory.org
Pacifica Land Trust	
Pacifica Locals	Vicki Moore vicki@callvicki.com, but also through the FB group - it has almost 7k members
Pacifica Moose Lodge	
Pacifica Mother's Club	
Pacifica Peace People	
Pacifica Pride	
Pacifica Realtors Group	Christine Stahl
Pacifica Resource Center	Anita M. Rees <Anita@pacresourcecenter.org>
Pacifica Runners Club	
Pacifica School District	
Pacifica School District Superintendent	
Pacifica School District Parents and Students and Teachers	
Pacifica United	
Pacifica Youth Advisory Council	
Pacifica-Daly City Democrats	
Pacificans Care	pacificanscare1982@gmail.com
Pacifica's Environmental Family	https://www.facebook.com/PacificasEnvironmentalFamily/
Pedro Point Association	
Pedro Point Surf Club	
Recology	

Rotary Club	President Vickie Flores or other known contact
Sanchez Art Center	Cindy Abbott
Sanchez Library	Teixeira, Paula <teixeira@smcl.org>
Sharp Park Library	Teixeira, Paula <teixeira@smcl.org>
Social Unity Project	
Tribal Leaders	
Tigersharks	
Tree City Pacifica	treecitypacifica@gmail.com, ptotah@siprep.org
Muchia Te' Indigenous Land Trust	Catalina Gomes, muchiate.ilt@gmail.com
Influential Community Members (any come to mind?)	
St Peters Church	
St Edmunds	
Good Shepard	
Coastwide Jewish Community	
List other Faith based orgs	
San Mateo County Transportation Authority Planning and Fund Management	"Gilster, Patrick" <gilsterp@samtrans.com>
Metropolitan Transit Commission (MTC)	
San Francisco Municipal Transportation Agency (SFMTA)	
Golden Gate Transit	
AC Transit	
Santa Clara County Valley Transit Authority (VTA)	
ChargePoint	
Electrify America	
EVgo	